

**DRAFT  
ENVIRONMENTAL ASSESSMENT/  
INITIAL STUDY**

**SOUTH SACRAMENTO COUNTY STREAMS PROJECT  
UNIONHOUSE CREEK CHANNEL UPGRADES**

**October 2008**



**US Army Corps  
Of Engineers**

Sacramento District South Pacific  
Division



Sacramento  
Area Flood  
Control  
Agency

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**U.S. ARMY CORPS OF ENGINEERS  
SACRAMENTO DISTRICT**

**THE CENTRAL VALLEY FLOOD PROTECTION BOARD  
STATE OF CALIFORNIA**

**SACRAMENTO AREA FLOOD CONTROL AGENCY  
SACRAMENTO, CALIFORNIA**

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UNIONHOUSE CREEK CHANNEL UPGRADES**

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**October 2008**

**Type of Statement.** Draft Environmental Assessment/Initial Study.

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

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

**Abstract:** The U.S. Army Corps of Engineers, the Central Valley Flood Protection Board, and the Sacramento Area Flood Control Agency propose to make design refinements to the previously authorized South Sacramento County Streams Project in south Sacramento County, California. The proposed action includes channel upgrades to Unionhouse Creek. This action would raise the level of flood protection in the project area to a point that it can safely contain a flood event with a 1% chance of occurrence in any given year and ensure that the area meets the minimum Federal Emergency Management Agency (FEMA) level of flood protection.

The Draft Environmental Assessment/Initial Study (EA/IS) describes the environmental resources in the project impact area; evaluates the direct, indirect, and cumulative environmental effects of the no action plan and the alternative plan; and recommends avoidance, minimization, and mitigation measures. All potential adverse effects that would result from the proposed alternatives would either be short-term, or would be avoided or reduced by using best management practices. The Draft EA/IS provides full public disclosure of the environmental effects of the project alternatives.

**Public Review and Comment:** The official closing date for receipt of comments on the Draft EA/IS is Friday November 21, 2008. The Sacramento Area Flood Control Agency will hold a board hearing on Thursday November 20, 2008. All comments received will be considered and incorporated into the Final EA/IS, as appropriate. Requests for a copy of the draft EA/IS can be directed to the Corps at the following address: U.S. Army Corps of Engineers, Sacramento District, Attn: Mr. Brian Buttazoni, 1325 J Street, Sacramento, California 95814-2922, or email: [Brian.L.Buttazoni@usace.army.mil](mailto:Brian.L.Buttazoni@usace.army.mil).

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- B. Regionally Occurring Species Table
- C. List of Plant and Animal Species Observed
- D. Fish and Wildlife Service Coordination Act Report
- E. USFWS Consultation
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- G. Section 404(b)(1) Analysis for South Sacramento County Streams, Unionhouse Creek Channel Upgrades

H. State Historic Preservation Officer correspondence letter

## **1.0 PURPOSE AND NEED FOR ACTION**

### **1.1 Proposed Action**

The U.S. Army Corps of Engineers (Corps), the Central Valley Flood Protection Board (CVFPB), and the Sacramento Area Flood Control Agency (SAFCA) propose to make additional design refinements to the previously authorized South Sacramento County Streams Project in south Sacramento County, California. The Corps is the lead agency under the National Environmental Policy Act (NEPA). SAFCA is the lead agency under the California Environmental Quality Act (CEQA). The CVFPB is a responsible agency participating in funding.

The proposed action includes channel upgrades to Unionhouse Creek. This action would raise the level of flood protection in the project area to a point that it can safely contain a flood event with a 1% chance of occurrence in any given year and ensure that the area meets the minimum Federal Emergency Management Agency (FEMA) level of flood protection.

### **1.2 Location of the Project Area**

The South Sacramento County Streams Project area is located in the lower elevations of the Morrison Creek watershed. Most of the watershed is in the Sacramento Valley, while the eastern-most parts of the watershed are in the lower foothills of the Sierra Nevada. Generally, the Morrison Creek watershed lies south and east of the City of Sacramento. The “Morrison Creek stream group” includes Morrison, Florin, Elder, and Unionhouse Creeks. Unionhouse Creek in the project area is located in southern Sacramento County (Plate 1) on land owned and managed by the City of Sacramento.

Unionhouse Creek is located within the Beach/Stone Lakes basin, a system of streams, lakes, and floodplains that drains the area southeast of Laguna and Elk Grove Creeks and the Morrison Creek watershed. The Beach/Stone Lakes basin receives runoff from approximately 49 square miles of local urban and rural tributary areas and ultimately discharges through the Lambert Road structure into Snodgrass Slough, a tributary of the Mokelumne River and the Sacramento-San Joaquin Delta. The Lambert Road structure is a flap gate designed to allow one-way flow out of North and South Stone Lakes into Snodgrass Slough. An additional water control valve at the Lambert structure can also be opened to allow flow from Snodgrass Slough back into South Stone Lake (SRCSD, 2000).

Historically the Beach/Stone Lakes basin was an overflow area of the Sacramento River (SRCSD, 2000). The primary streams in the Beach/Stone Lakes basin are Morrison Creek and its major tributaries: Elder Creek, Florin Creek, Laguna Creek, and Unionhouse Creek. Unionhouse Creek empties into Morrison Creek less than one mile downstream of the study area. During non-flood conditions, there is no direct hydrologic connectivity between Unionhouse Creek and the Sacramento River (SAFCA, 2004). During these periods, water is pumped from Morrison Creek into the Sacramento River by the City of Sacramento (SAFCA, 2004). Regional hydrology of the Morrison Creek watershed is shown on Plate 2.

Unionhouse Creek in the project area flows west of Franklin Boulevard along the northern edge of the Bufferlands. The Bufferlands was established in the 1970s by the Sacramento Regional County Sanitation District (SRCSD) as a planned large undeveloped buffer area between the Sacramento County Regional Wastewater Treatment Plant and surrounding neighborhoods. The Bufferlands encompasses 2,650 acres of managed wetlands, grasslands, and riparian forest habitat.

The proposed project impact area (Plate 3) evaluated for the purpose of this Environmental Assessment/Initial Study (EA/IS) includes an area approximately 72 feet wide centered along the segment of Unionhouse Creek from approximately 200 feet upstream (east) of Center Parkway to approximately 200 feet downstream (west) of Franklin Boulevard. The project impact area includes a 15 foot wide offset on the north side of the creek, 42 feet wide improvements to the creek, and 15 foot wide offset on the south side of the creek. A maintenance road would be located within the 72 feet wide project impact area between the Franklin Boulevard Bridge and the Center Parkway Bridge. (Plate 4)

A buffer area (Plate 3) adjacent to Unionhouse Creek between the creek and Cosumnes River Boulevard would be used for temporary staging and material disposal and will also be evaluated in this EA/IS. Excavated material from Unionhouse Creek not used for backfill purposes would either be sold or disposed of at an appropriate waste site authorized to accept such waste. The buffer area is vacant and approximately 50 feet wide and covers nearly 6.6 acres. Construction access routes for the project would be along Cosumnes River Boulevard, Franklin Boulevard, and State Route 99. (Plate 3)

The proposed construction activities would be located within the above identified project impact area and would be primarily limited to the drainage channel of Unionhouse Creek.

### **1.3 Background and Need for Action**

The Corps, the CVFPB, and SAFCA have conducted numerous studies and environmental documents related to flood control projects in the Morrison Creek stream group. The following provides a summary of some of the key reports leading up to the proposed Unionhouse Creek Channel Upgrades.

The South Sacramento County Streams drainage basin has a long history of flooding during heavy rainfall. Recent flooding in 1952, 1955, 1962, 1963, 1982, 1985, and 1986 damaged residences, businesses, and agricultural land and disrupted transportation and public facilities. Local runoff from the Morrison Creek watershed can cause flooding due to limited channel capacities and bridge restrictions and contributes to the flood volume in the Beach-Stone Lakes area. In addition, overflow from the Cosumnes and Mokelumne rivers inundates Beach-Stone Lakes, causing high backwater on the study creeks, and threatening the treatment plant and the Pocket Area.

To address potential flooding hazards, the South Sacramento County Streams Project was authorized by the Water Resources Development Act of 1999. The selected plan, described in the Final Feasibility Report (prepared in 1998), includes a combination of flood protection

features including raising and extending levees, the installation of concrete walls, and modifications to existing channel geometry.

In 1998 the Corps and SAFCA prepared a joint Environmental Impact Statement / Environmental Impact Report (EIS/EIR) addressing improvements on the streams within the Morrison Creek Stream Group in accordance with CEQA and NEPA (State Clearinghouse No. 1997102056). The Corps identified the Locally Preferred Plan and completed the Final EIS/EIR, recognizing that changes to the project may occur during design. SAFCA subsequently certified the completion of the EIR in April 2000.

However, refined design elements were identified when previously performed flood hydrology studies were found to need revision and updating. As a result of the revision, SAFCA and the Corps developed a series of refined design elements that would raise the level of flood protection along the Morrison Streams Group waterways to a point that they could safely contain a flood event with a 1% chance of occurrence in any given year. Without these refinements, the area would not be provided protection from a flood event with a 1% chance of occurrence in any given year on these streams. Areas that are also subject to flooding from other water sources, such as the American or Sacramento Rivers, would be subject to reduced flooding as a result of the project, but would still be required to maintain flood insurance. Separate projects are being undertaken to provide flood protection on the American and Sacramento Rivers. The Corps released an EA addressing the proposed refined design improvement measures in 2004. The EA concluded that the proposed design improvements would be implemented with no significant adverse effect on the environment, supporting a Finding of No Significant Impact (FONSI).

In 2004, SAFCA prepared a separate Supplemental EIR on the refined design improvements pursuant to CEQA Guidelines Section 15163. This Supplemental EIR relied on the 1998 EIS/EIR analysis and complemented it by evaluating the additional environmental effects that would result from changes to the previously studied project features and components. SAFCA adopted a statement of overriding considerations for the 2004 Supplemental EIR at the time of project approval.

Currently, the Corps, the CVFPB, and SAFCA are proposing to make further design refinements to the previously authorized South Sacramento County Streams Project. The proposed action includes channel upgrades to Unionhouse Creek, which are described in more detail below.

### **1.3.1 Other Projects in the Project Vicinity**

The following projects are planned or proposed in the area of the proposed project. These projects have been the subject of environmental review and mitigation or compensation measures have been developed to avoid or reduce any adverse effects to a less than significant status, based on Federal and local agency criteria. Section 5.1, compares the cumulative effects of the proposed project to the effects presented in the environmental documents for the projects listed below.

**Cosumnes River Boulevard Extension (City of Sacramento).** The I-5/ Cosumnes River Boulevard Interchange Project includes extending Cosumnes River Boulevard from its

current westerly terminus at Franklin Boulevard to a new interchange at I-5, and then farther west to an at grade intersection with Freeport Boulevard in the currently unincorporated town of Freeport. Just west of the Morrison Creek Bridge, the Cosumnes River Boulevard alignment would travel north and then west until reaching the interchange location. The Lower Northwest Interceptor, the Freeport Regional Water Authority Project pipeline, and other various utilities have been constructed along the Cosumnes River Boulevard extension alignment (see below). The Sacramento Regional Transit proposed Phase 2 light rail transit alignment would be located to the north and generally parallel to the roadway extension. Vehicular access to the Franklin Boulevard light rail station and park-and-ride lot would be provided by the Cosumnes River Boulevard extension. A Draft EIS/ EIR was completed for the Cosumnes River Boulevard Extension Project in December 2006. A Final EIS/EIR was completed in April 2007 and a Notice of Determination (NOD) was issued in May 2007. (City of Sacramento, 2006 and 2007a)

**Freeport Regional Water (Diversion) Project (Freeport Regional Water Authority - County of Sacramento, East Bay Municipal Utility District).** The Freeport Regional Water Project (FRWP) is a joint venture of the Sacramento County Water Agency (SCWA) and East Bay Municipal Utility District (EBMUD) to supply water from the Sacramento River to customers in Sacramento County and the East Bay. The FRWP provides SCWA with up to 85 million gallons of water per day (mgd). FRWP permits SCWA to supply this water to its customers in central Sacramento County to supplement groundwater use in the central part of the County. The FRWP also allows EBMUD to use up to 100 mgd of water during dry years only, estimated to be three out of every ten years, as a supplemental water source to complement existing conservation programs. A Draft EIS/EIR was completed in 2003 and a Final EIS/EIR was completed in 2004 for the FRWP. (Freeport Regional Water Authority, 2003 and 2004) A NOD was issued in March 2008. The FRWP facilities include a water intake/pumping plant located on the Sacramento River, a 17-mile pipeline to convey water from the river through Sacramento County to the Folsom South Canal, a new water treatment plant in central Sacramento County, a new water pumping plant at the southern end of the Folsom South Canal, and a pipeline to convey water from the Folsom South Canal pumping plant to the Mokelumne Aqueducts in San Joaquin County.

Currently Freeport Regional Water Authority is in the process of constructing a new water intake facility/pumping plant and a 17-mile underground water pipeline within Sacramento County. The new water intake facility and pumping plant is located on the Sacramento River at the Freeport Bend, upstream of the town of Freeport and about ten miles south of downtown Sacramento. The pumping plant will divert up to 185 mgd of water from the river and pump it through new pipelines to other project facilities. The water intake facility will include state-of-the-art fish screens to protect fish populations in the river. Construction of the water intake facility began in January 2007. The facility and its surrounding structures will be completed in November 2009.

An 84-inch diameter pipeline will run from the water intake facility to the intersection of Gerber and Vineyard Roads in central Sacramento County, where the pipeline will split into two branches. One branch of the pipeline will continue on Gerber Road to the Folsom South Canal in eastern Sacramento County. Water will discharge into the canal and flow to a second pumping plant at the canals southern end. The pumping plant will then pump the water through a new pipeline in

San Joaquin County to the Mokelumne Aqueducts. The water will flow down the aqueducts for use by EBMUD customers. EBMUD will rely on the new facilities to provide supplemental water during dry years only. The other branch of the pipeline will head one mile north of Vineyard Road to a new water treatment plant on Florin and Knox Roads operated by SCWA. This plant will treat water for delivery to the agency's customers in central Sacramento County.

For purposes of efficiency and oversight, construction of the pipeline will be completed in four segments. Below is a general summary of the four pipeline alignment routes in Sacramento County and an approximate construction timeline for each segment. The entire duration of pipeline construction will be approximately two years.

Pipeline Segment 1

Location: I-5 east to Hwy. 99 in Sacramento County

Timeframe: August 2007 - December 2008

Pipeline Segment 2

Location: Hwy. 99 east to Gerber/Vineyard Road intersection in Sacramento County

Timeframe: July 2007 - July 2009

Pipeline Segment 3

Location: Gerber/Vineyard Road intersection east to the Folsom South Canal

Timeframe: September 2007 - April 2008

Pipeline Segment 4

Location: Gerber/Vineyard Road intersection north to SCWAs new surface water treatment plant on Florin Road

Timeframe: October 2007 - December 2008

Pipeline segment 1 parallels the Unionhouse Creek corridor, as noted above.

**Sacramento Regional County Sanitation District (SRCSD) Lower Northwest Interceptor Project.** SRCSD has constructed a 17-mile-long wastewater interceptor between the Natomas area in north Sacramento and the Sacramento Regional Wastewater Treatment Plant (SRWTP) just south of the I-5/Cosumnes River Boulevard project area. Specifically, the interceptor alignment runs through West Sacramento, includes two Sacramento River crossings and parallels the north alignment of the Cosumnes River Boulevard Extension Project. SRCSD certified an EIR in 2003 and issued a NOD in April 2003 for this project. (SRCSD, 2003) Construction of the project began in 2004 and the portion of the interceptor alignment within the Cosumnes River Boulevard interchange project area was completed in 2006.

**South Sacramento Corridor Phase 2.** Sacramento Regional Transit District (RT) proposes to extend light rail transit (LRT) service 4.3 miles from the South Sacramento Corridor Phase 1 terminus at Meadowview Road. A Supplemental Draft EIS / Subsequent EIR was completed in January 2007 (RT, 2007). The proposed alignment would travel southward along the UPRR right-of-way, turning east crossing the UPRR and Unionhouse Creek, continuing east to the north of the proposed extension of Cosumnes River Boulevard, crossing Franklin Boulevard and traveling along the northern side of Cosumnes River Boulevard, then turning south along the western side of Bruceville Road and terminating at Cosumnes River College.

This project, called the Locally Preferred Alternative Phase 2 (LPAP2), includes four new stations at: (a) Morrison Creek, (b) Franklin, (c) Center Parkway, and (d) Cosumnes River College. Three new park-and-ride lots would provide over 2,700 spaces: (a) Morrison Creek with 50 spaces, (b) Franklin with 650 spaces, and (c) Cosumnes River College with 2000 spaces.

Grade-separated pedestrian/bike crossings are proposed at the Franklin and Center Parkway stations. A grade separation for the light rail line is under consideration for Meadowview Road, Franklin Boulevard, and Cosumnes River Boulevard. Vehicle maintenance for the LPAP2 LRT vehicles would occur at RT's central maintenance facility. RT has acquired additional LRT vehicles to operate on the LPAP2. The final environmental documentation and project approval process is not yet complete.

#### **Sacramento Area Sewer District Central Trunk Sewer Rehabilitation Project.**

The Sacramento Area Sewer District (SASD), formerly County Sanitation District-1, is proposing the rehabilitation of approximately eight miles of gravity sewer pipeline, from Fruitridge Road and Power Inn Road to the SRWTP and 3,000 linear feet of gravity sewer pipeline along Franklin Boulevard between Mack Road and Brookfield drive, by using the cured-in-place pipe method. The project also includes the rehabilitation of up to 108 manholes in the public right-of-way, which will entail minor excavation to remove manhole cones at liner insertion pits. SASD will bypass the sewer flows during the rehabilitation process. Bypass lines will be located primarily in public right-of-way, above or below grade. Bypass lines will be tunneled or bored under Highway 99 at Mack Road. Furthermore, seven manholes and 3,600 feet of pipeline located in the SRCSD Bufferlands will be rehabilitated. No bypass of flows will occur in the Bufferlands and work in this area will be permitted between June 1 and October 1. Sacramento County on behalf of SASD prepared a Mitigated Negative Declaration in June 2008. According to the project website, construction of the SASD Central Trunk Rehabilitation Project is anticipated to begin in fall 2008 and end in early summer 2010. (SASD, 2008)

### **1.4 Authority**

Authorization for channel upgrades in Unionhouse Creek was provided by the South Sacramento County Streams Project. The South Sacramento County Streams Project was authorized in the Water Resources Development Act of 1999 (Public Law 106-53). The Record of Decision for the 1998 EIS/EIR was provided by the Chief of Engineers on June 28, 2000. This authorization also serves as authorization for the additional refinements to the South Sacramento County Streams Project (i.e., the current project under consideration).

### **1.5 Purpose of the EA/IS**

This EA/IS (1) describes the existing environmental resources in the project area, (2) evaluates the environmental effects of the alternatives on these resources, and (3) identifies measures to avoid or reduce any effects to less than significant. This EA/IS has been prepared in accordance with NEPA and CEQA.

## **1.6 Decisions Needed**

The District Engineer, commander of the Sacramento District of the Corps, must decide if the proposed work qualifies for a FONSI under NEPA or whether an EIS must be prepared. Also, SAFCA must decide if a Mitigated Negative Declaration is the appropriate environmental document to comply with CEQA or whether an EIR must be prepared.

## **2.0 ALTERNATIVES**

### **2.1 Alternatives Eliminated from Further Consideration**

In November 2007, HDR performed an Alternatives Analysis for the Unionhouse Creek Channel Upgrades. (HDR, 2007) The analysis was based on other projects proposed in the vicinity of Unionhouse Creek and the need to evaluate design alternatives that would provide an equivalent level of flood protection within a narrower right-of-way. The level of flood protection provided by the recommended alternative in the Limited Reevaluation Report (LRR) (Corps, 2004a) and the final hydraulic design report is the minimum level of flood protection acceptable. Therefore, three conceptual design alternatives were selected for comparison through hydraulic modeling. A fourth alternative was included in the analysis after the original three alternatives were analyzed.

**Alternative 1** – Concrete-Lined Trapezoidal Channel with 2H:1V Side Slopes: this alternative was evaluated using the same side slopes as recommended in the LRR and a model was run as if the channel was concrete-lined. This was done to determine if any improvement in channel performance would be offset by narrowing the bottom width of the channel. The minimum allowable bottom width of the channel was set at ten feet.

**Alternative 2** – Concrete-lined trapezoidal channel with 1.5H:1V side slopes: this alternative was evaluated using the same bottom width as recommended in the LRR and a model was run as if the channel was concrete-lined with 1.5:1 side slopes. This was done to determine if any improvement or reduction in channel performance would be offset by adjusting the bottom width of the channel. The bottom width of the channel was set at ten feet. Alternative 2 would extend upstream of Center Parkway to the confluence of Unionhouse Creek and Strawberry Creek.

**Alternative 3** – Stone Gabion-Lined Channel with 1H:1V Side Slopes: this alternative was evaluated using the same bottom width as recommended in the LRR, and a model was run as if the channel was lined with stair-stepped stone gabions. It was assumed that the exposed vertical and horizontal faces of the gabions would be three feet. This was done to determine if any improvement or reduction in channel performance would be offset by adjusting the bottom width of the channel. The minimum allowable bottom width of the channel was set at ten feet.

After initial hydraulic modeling was developed for Alternative 3, it was determined that the cross-section geometry was inadequate and was causing unacceptable increases in water surface elevations. Therefore, the channel geometry for Alternative 3 was altered to reflect a bottom width of 26 feet and 1.5:1 Side Slopes. It was assumed that the exposed vertical faces of the gabion are three feet and horizontal faces of the gabion would be 4.5 feet.

**Alternative 4** – Concrete-Lined Channel with a bottom width of 18 feet, a vertical south bank, and north bank with 1.5H:1V Side Slope: Alternative 4 was evaluated and a model was run as if the channel was concrete-lined with a vertical bank to the south (left bank) and with 1.5:1 side slope for the north bank (right bank). The bottom width of the channel was set at 18 feet. This was done to determine if any improvement or reduction in the width of the typical cross-section could be achieved. This alternative was analyzed between Franklin Boulevard and Center Parkway with the LRR design as the base condition.

Based on the results of the evaluation of the alternatives, it was determined that Alternative 2 and Alternative 4 necessitate a significant increase in rights-of-way necessary to construct improvements and Alternatives 1 and 3 do not. Alternative 4 provides a slightly higher gain in rights-of-way and a marginal increase in the level of flood protection than Alternative 2. However, the feasibility of constructing Alternative 4 is expected to be less than Alternative 2 due to the inclusion of a vertical structural wall along the south bank of Unionhouse Creek. For these reasons and because Alternatives 1, 2, 3, and 4 would not meet the stated purpose and need of the proposed action, these alternatives were eliminated from further consideration.

## **2.2 No Action Alternative**

Under the no action alternative, the Corps, the CVFPB, and SAFCA would be authorized to construct the flood damage reduction features included in the previously adopted 1998 EIS/EIR, 2004 EA, and 2004 SEIR. However, these previously adopted flood damage reduction measures would not raise the level of flood protection in the project area to a point that it could safely contain a flood event with a 1% chance of occurrence in any given year. Therefore, the risk of flooding and resulting flood damages due to limited channel capacity in Unionhouse Creek would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Continued urbanization in the upper Morrison Creek watershed would likely result in increased flows in the future.

Flooding problems would likely continue in the future due to projected population increases in Sacramento City and County. Flooding would damage homes, businesses, and public facilities such as the Sacramento Regional Wastewater Treatment Plant. Any flooding of the regional treatment plant could cause the plant to operate below water quality standards. The inability to process sewage would also cause environmental and health problems in the regional treatment plant's service area.

## **2.3 Construct Unionhouse Creek Channel Upgrades**

This section describes the proposed action for the Unionhouse Creek channel upgrades. This includes a discussion of features and construction details including channel excavation, bridge retrofitting, drop structures, staging, borrow and disposal sites, construction equipment and personnel, access routes, schedule, restoration and cleanup, and operation and maintenance for the proposed project.

### 2.3.1 Features

The proposed design refinements in this EA/IS are refinements to the feasibility-level plan in the 1998 EIS/EIR, which identified the Consistent High Protection Plan as the selected plan. The primary difference between the original design and the refined design is the increase in channel capacity through channel excavation, bridge retrofits, and box culverts. Due to constrained rights-of-way availability as a result of other planned projects in the vicinity, additional channel upgrades are being proposed that were not initially identified in the 1998 EIS/EIR, 2004 EA, or 2004 SEIR.

The proposed action consists of upgrading the channel of Unionhouse Creek for approximately 5,800 feet, from 200 feet downstream (west) of Franklin Boulevard to 200 feet upstream (east) of Center Parkway (Plate 3). The primary purpose of this effort is to increase the creek channel's capacity to handle higher flows during flood events. Unionhouse Creek currently has a low-flow, concrete-lined trapezoidal channel that is 12 feet wide on the bottom and 68 feet wide on the top. The proposed action includes reshaping the creek bed and channel into a rectangular concrete lined channel.

Rectangular concrete channels are typically used to increase channel capacity by shaping the channel cross-section into a rectangular shape and lining the channel with concrete. The shape of the channel combined with the concrete lining reduces friction in the channel so channel velocity and volume are increased while water surface elevations are decreased. A rectangular concrete channel is proposed for the project area due to the limited rights-of-way available. In limited areas, rectangular channels can be more efficient than trapezoidal channels.

The channel bottom would be deepened approximately two feet and widened approximately 32 feet toward the south bank. The rectangular concrete channel would be approximately 40 feet wide by 17 feet deep. The concrete channel would extend above grade on both sides of the channel. On the south side the extended concrete channel would be two to three feet above ground level and on the north side it would be two to five feet above ground level. The above ground extension of the concrete channel would have a uniform thickness of approximately one foot on either side. The extension of the concrete channel contributes to the structural integrity of the rectangular channel. A vegetated swale would be constructed within the 72 feet wide project impact area. The vegetated swale would serve both a water quality function and a drainage function for the project area. A 15-foot wide maintenance road would also be constructed within the 72 feet wide project impact area between the eastern edge of the Franklin Boulevard Bridge and the western edge of the Center Parkway Bridge. Flap gates would be periodically spaced over the length of the rectangular channel to convey drainage from the vegetated swale and the maintenance road into the channel.

In-channel construction methods would be utilized. The Franklin Boulevard and Center Parkway bridges would be retrofitted with parapet walls to pass water more efficiently under the bridges during pressure flow conditions.

### 2.3.2 Construction Details

**Channel Excavation.** Channel excavation would involve deepening the channel and widening the existing channel to increase the volume of the channel. Equipment and materials would be transported on local roadways to the construction sites. Existing ramps would be used to access the channel, when possible, or temporary ramps would be constructed, if needed. Existing service roads would also be used, if available. Staging areas would be along the existing channel banks and could also be within the channel. Channel excavation would be conducted using in-channel construction methods. First, the channel would be dewatered by installing temporary cofferdams and diverting stream flow around the section to be excavated. Unionhouse Creek channel has a concrete low-flow channel bottom; channel deepening would require removal of the existing concrete low-flow channel. Old concrete would be removed and disposed of at an appropriate waste site authorized to accept concrete waste. The total volume of concrete to be removed would be approximately 10,000 cubic yards. Vegetation on the channel banks and bottom would then be cleared and transported to the nearest dump or landfill for disposal.

Excavated material from Unionhouse Creek not used for backfill purposes would be temporarily staged on the adjacent buffer area (Plate 3) and would either be sold or disposed of at an appropriate waste site authorized to accept such waste. The total volume of cleared vegetation and soil to be excavated and removed is approximately 89,500 cubic yards.

From Franklin Boulevard to Center Parkway, the channel depth would be excavated approximately two feet. The bottom width of the channel would be increased to 40 feet wide toward the south bank. The new right-of-way area for Unionhouse Creek would be limited to 72 feet to accommodate proposed improvements and projects in the immediate area. A conceptual cross section drawing of the proposed project is shown in Plate 4.

The concrete channel would be constructed after excavation and other design measures are complete. The concrete would be allowed the appropriate amount of time to cure. As construction is completed in each stream section, equipment would be removed from the staging area. The cofferdam would then be removed, and stream flow would be diverted back into the stream channel.

**Bridge Retrofitting.** Bridge retrofitting would involve modifying a bridge's structure to ensure unimpeded passage of flows under the bridge. Prior to the refined design, proposed bridge modifications included concrete aprons, new parapet walls, in-fill walls, and plugging of deck drains. Both bridges in the project area have concrete channels under them. Once the concrete channel is removed, selected foundation piers would be excavated, and the spread footing would be removed. A new spread footing at the correct elevation would be constructed using reinforced concrete. Temporary shoring would be used to support the affected portion of the bridge during this work. In addition, the Center Parkway Bridge would be retrofitted with in-fill walls and new, lower spread footings at each pile.

**Drop Structures.** Drop structures, or weirs, would be constructed in the channel where there is a need to avoid potential erosion due to grade breaks. Grade breaks are anticipated at or near the upstream end of the project area where the excavated channel would merge with the

existing channel. Typical construction of drop structures would entail shallow excavation, construction of concrete forms, and placement of reinforced concrete. Where necessary, drop structures would be stepped to allow for fish passage. The drop structures/weirs would include a 15-foot concrete apron upstream of the drop structure to prevent channel scouring and resultant sediment buildup at the drop structure. As with channel excavation, drop structures would be constructed while cofferdams are in place and stream flow is diverted around the construction area. There would be one drop structure constructed downstream of the Center Parkway Bridge on Unionhouse Creek.

**Staging and Disposal Sites.** Staging areas for equipment would be located primarily within the channel. The location of the staging areas would depend on the channel segment being dewatered and excavated. Temporary equipment staging would also take place in the area southeast of the Franklin Boulevard Bridge between the creek and Cosumnes River Boulevard in case of rain events.

Several disposal sites would be used depending on the type of material. Old concrete from the low-flow channel would be disposed at an approved waste site authorized to accept concrete waste. Cleared vegetation from the channel would be transported to the nearest dump or landfill for disposal. As stated previously, excavated material from Unionhouse Creek not used for backfill purposes would be temporarily placed on the vacant area adjacent to the creek between Franklin Boulevard and Center Parkway and would either be sold or disposed of at an appropriate waste site authorized to accept such waste.

**Construction Equipment and Personnel.** Equipment and personnel to be used for the design refinements would be similar to those needed for the original design. An estimated five to ten workers would be onsite each day during construction. These workers would access the area via regional and local roadways, and would park their vehicles in the staging area. Construction hours would be limited daily from 7:00 a.m. to 6:00 p.m. Monday thru Saturday, and 9:00 a.m. to 6:00 p.m. on Sundays.

**Access Routes.** Access routes to and from the project area would be the same as identified in the 1998 EIS/EIR. Access to Unionhouse Creek would be from State Route 99, Cosumnes River Boulevard, and Franklin Boulevard.

**Schedule.** Construction of the Unionhouse Creek channel upgrades would take place in 2009 or 2010 and would last at least six months.

**Restoration and Cleanup.** Once construction activities are completed, all equipment and excess materials would be transported offsite via local streets and regional highways. The barren areas and portions of the project area would be reseeded with native grasses to promote revegetation and minimize soil erosion. The work sites and staging areas would be cleaned of all rubbish, and all parts of the work area would be left in a safe and neat condition suitable to the setting of the area.

**Operation and Maintenance.** Operation and maintenance procedures would be consistent with those proposed in the 1998 EIS/EIR. Operation and maintenance procedures are under development and will be established prior to construction.

### **3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This section describes the environmental resources in the project area, as well as any effects of the alternatives on those resources. When necessary, mitigation measures are also proposed to avoid, reduce, minimize, or compensate for any significant effects.

#### **3.1 Environmental Resources Not Considered in Detail**

Initial evaluation of the effects of the project indicated that there would likely be little to no effect on several resources. These resources are discussed below to add to the overall understanding of the project area.

##### **3.1.1 Climate**

The climate of the area is characterized by cool, wet winters and warm, dry summers. Precipitation ranges from 16 to 20 inches on the Sacramento Valley floor. Annual precipitation occurs almost entirely during the winter storm season (November to April). On average, the Sacramento Valley receives 20 inches of rainfall per year. Air temperatures in the valley are high in summer and moderate in winter, ranging from 20 to 115 degrees Fahrenheit. The project would have no effect on the climate in the project area.

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide greenhouse gas (GHG) emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs the California Air Resources Board (CARB) to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32. AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

AB 32 also recognized as a potential adverse impact of global warming, a reduction in the quality and supply of water to the state from the Sierra snow pack. Increases in precipitation received as rain and reductions in precipitation seen as snow are occurring, as annual runoff has shown an increasing trend in the Sacramento Valley for the past 100 years (DWR, 2006).

The project would consist of temporary, short-duration construction to upgrade the existing Unionhouse Creek channel and would have no effect on the regional climate. The

project would improve continued reliance on flood protection facilities in south Sacramento County if the frequency, and possibly the magnitude, of future flood events increase due to climate change.

### **3.1.2 Topography, Geology, and Soils**

The floor of the Sacramento Valley is generally flat and open with little natural relief. Elevations in the valley range from about sea level to about 400 feet above mean sea level (msl). Nearly level flood plains occur along the rivers and smaller creeks of the project area and vicinity. The project would not change the location and general topography of Unionhouse Creek. As a result, the project would have no significant effect on the topographic features of the area.

The project area is situated on vast alluvial deposits that have slowly accumulated over the last 100 million years. The materials have been derived from igneous, metamorphic, and sedimentary parent rock materials from the Sierra Nevada to the east, transported by major streams, and deposited in successive clay, silt, sand, and gravel layers on the valley floor. Geologic formations underlying the Sacramento Valley downstream range in age from pre-cretaceous to recent. The project would have no effect on the geologic features in the project area.

Dominant soils in the project area are the Clear Lake Clay and Galt Clay soils, formed in alluvium derived from mixed rock sources. Slopes in this series range from 0 to 2 percent. These soils are moderately deep and consist of a silt loam at the surface, with a subsoil of claypan underlain by cement hardpan. Soils in the project area would be disturbed during construction due to excavation and stockpiling of soil material and reuse of the stockpiled material to construct the project. The contractor would be required to prepare an Erosion and Sediment Control Plan identifying specific best management practices (BMPs) to avoid or minimize soil erosion. All suitable excavated soils material would be reused in the project area to the extent feasible. Excavated material from Unionhouse Creek would be temporarily placed on the vacant area adjacent to the creek between Franklin Boulevard and Center Parkway and would either be sold or disposed of at an appropriate waste site authorized to accept such waste. The barren areas and portions of the project area would be reseeded with native grasses to promote revegetation and minimize soil erosion. Although there would be a loss of permeable surface for infiltration due to the reshaping of the existing channel, there would not be an increase in non-point source runoff as a result of the project. Flap gates would be periodically spaced over the length of the rectangular channel to convey runoff and drainage from the vegetated swale and the maintenance road into the channel. As a result, there would be no significant adverse effects on soils due to the project.

The closest known active seismic fault is the Dunnigan Hills fault, located approximately 20 miles northwest of the City of Sacramento. Inactive faults in the vicinity include the Midland fault located approximately 20 miles west of the City of Sacramento and the Bear Mountain fault zone located east of Sacramento County. Seismic conditions associated with fault activity include groundshaking, liquefaction, settlement, and seiche. The project does not include construction of any structures intended for human occupancy. For this reason, the project would

not expose people to potential adverse effects resulting from fault activity. The project would have no effect on local faults or potential seismic activity in the area.

### **3.1.3 Public Services**

Public services in the project area include law enforcement, fire protection, medical assistance, and utilities. The Sacramento County Sheriff Department provides law enforcement and police protection, while the Sacramento City Fire District provides fire and emergency medical service. The nearest fire station is on Wyndham Drive, approximately one mile from the project area. The nearest hospitals are Kaiser Permanente or Methodist Hospital, also located approximately one mile from the project area. The Sacramento City Unified School District provides both public elementary and high schools for residents. North of the project area on Valley Hi Drive is Prairie Elementary School. The access routes and traffic management plan (discussed in Section 3.6.2) would be developed to ensure that public services and elementary school activities are not disrupted during construction. As a result, the project would have no adverse effects on public services and schools. In addition, the project would not increase the demand for the kinds of public services (e.g., parks, fire, police, or other public facilities) that would support new residents.

### **3.1.4 Utilities and Service Systems**

Utilities are provided by Pacific Gas and Electric (gas) and Sacramento Municipal Utility District (electricity). The City of Sacramento Department of Utilities provides and maintains water, sewer, solid waste, storm collection, and storm drainage services. No long-term interruption of utilities or services would take place in the project area. Construction would require temporarily accessing the existing potable water supply, sanitary sewer, or storm sewer systems. Excavated material from Unionhouse Creek not used for backfill purposes would be temporarily staged on the adjacent buffer area and would either be sold or disposed of at an appropriate waste site authorized to accept such waste. Old concrete would be removed and disposed of at an appropriate waste site authorized to accept concrete waste. Natural gas supply and electrical transmission lines would not be augmented except to establish the temporary electrical connection for the construction trailer. Consultation with the respective utility operators will determine any actions that may be needed to ensure continued utility service.

### **3.1.5 Recreation**

Construction of the Unionhouse Creek Channel Upgrades would occur within the South Sacramento Planning Area of the City of Sacramento Department of Parks and Recreation. There are no existing recreational facilities located adjacent to the Unionhouse Creek Channel Upgrades construction area. Construction of the Unionhouse Creek Channel Upgrades would not restrict access to or interrupt use of any recreational facilities. Furthermore, construction activities would be short-term and limited in scope. There are no anticipated effects on recreation in the project area.

### 3.1.6 Fisheries

This section discusses the fisheries resources and habitat that occur in the study area. Fish species that are known to occur in the Morrison Creek watershed were considered to have the potential to occur in Unionhouse Creek, which is in the lower basin of the Morrison Creek watershed.

Unionhouse Creek empties into Morrison Creek less than one mile downstream of the study area. During non-flood conditions, there is no direct hydrologic connectivity between Unionhouse Creek and the Sacramento River (SAFCA, 2004). During these periods, water is pumped from Morrison Creek into the Sacramento River by the City of Sacramento (SAFCA, 2004). This pump is an impassable barrier to fish species in the Sacramento River (SAFCA, 2004). During flood conditions, floodwaters from the Mokelumne River back up into Beach and Stone Lakes basin through the Lambert structure providing access for fish into the creeks upstream, including Unionhouse Creek.

Currently, Unionhouse Creek is a channelized flood control drainage with a concrete lined low flow channel in the study area. The only source of water for Unionhouse Creek in the summer is agricultural and/or urban runoff. This results in very low flows, high temperatures, and poor water quality in the creek during the summer. Some vegetation was observed growing in the bottom of the channel during surveys but the channel bottom lacked any soil or gravel substrate that would provide habitat for aquatic invertebrates or cover for fish. Vegetation on the creek bed and along the lower portion of the banks is removed annually as part of maintenance practices to improve creek flow (SAFCA, 2004). This combination of factors results in poor quality fish habitat in Unionhouse Creek most of the time. Fish are occasionally found in the creek during flood events, usually as upstream or downstream migrants and can become stranded in the creek after flood events (SAFCA, 2004).

The majority of the fish species found in the Morrison Creek watershed are resident species with the exception of winter, fall/late-fall and spring Chinook salmon (*Oncorhynchus tshawytscha*) which are migratory species occasionally found in the creeks during flood events. Resident species in the Morrison Creek watershed include: white catfish (*Ameiurus catus*), black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), brown bullhead (*Ameiurus nebulosus*), goldfish (*Carassius auratus*), warmouth (*Chaenobryttus gulosus*), sculpin ssp. (*Cottus* ssp.), common carp (*Cyprinus carpio*), threadfin shad (*Dorosoma petenense*), mosquito fish (*Gambusia affinis*), California roach (*Hesperoleucus symmetricus*), channel catfish (*Ictalurus punctatus*), bluegill (*Lepomis macrochirus*), inland silverside (*Menidia berylina*), largemouth bass (*Micropterus salmoides*), hardhead (*Mylopharadon conocephalus*), Sacramento blackfish (*Orthodon microlepidotus*), bigscale logperch (*Percina macrolepida*), white crappie (*Pomoxis annularis*), and black crappie (*Pomoxis nigromaculatus*) (SRSCD, 2000).

Because Unionhouse Creek is cut-off from the Sacramento and Mokelumne Rivers except during major flood events and has poor habitat conditions for fish, it does not provide habitat for migratory fish species and is not an important migratory corridor. The Beach and Stone Lakes basin and its tributary streams including Unionhouse Creek are not designated as

Critical Habitat or Essential Fish Habitat for any of the federal listed Chinook salmon evolutionarily significant units.

The proposed project is not expected to have an adverse affect on special-status fish species or their habitats because: 1) the existing fish habitat is poor; 2) Unionhouse Creek is not designated as Essential Fish Habitat or Critical Habitat; and 3) Unionhouse Creek does not support special-status fish species except during flood events.

### **3.1.7 Land Use and Community Impacts**

The primary land use designations in the project area are the same as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR and include residential, commercial, agriculture, and open land. Unionhouse Creek in the project area is an urban waterway that currently contains a concrete low-flow and earthen channels that are fenced off and are not accessible to the public. There are no prime and unique farmlands within the project area. Along the north side of Unionhouse Creek there are residences within 20 feet. The City and the County's General Plan have designated the majority of the project area north of Unionhouse Creek as low density residential. The area south of Unionhouse Creek between Franklin Boulevard and Center Parkway is open and proposed to be developed by RT. The Bufferlands are located west of Franklin Boulevard and south of Unionhouse Creek and owned and maintained by SRCSD.

Other projects in the vicinity of the proposed project are described in detail in Section 1.3.1. These projects include the Cosumnes River Boulevard Extension Project, the Freeport Regional Water Authority Project, the Lower Northwest Interceptor Project, and the proposed South Line Light Rail Extension Project. The purpose of these projects and the proposed extension of the South Line light rail system are to meet the growing municipal service and traffic demands in the region. The Freeport Regional Water Authority Project and the Lower Northwest Interceptor Project are being constructed within the Cosumnes River Boulevard Extension right-of-way. The proposed RT South Line Light Rail Extension Project would also run adjacent to the Consumes River Boulevard Extension right-of-way. Any change in land use designation by the City or County would be compatible with their development plans for South Sacramento. The proposed project does not propose changes to land use designations and would have no adverse effects to existing or proposed land uses within the project area. Therefore, the proposed project would not require any mitigation for land use.

## **3.2 Vegetation and Wildlife**

This section discusses vegetation and wildlife resources in the study area. The discussion includes describing the biological habitat types, including waters of the U.S. that occur in the study area as well as plant and animal species associated with these habitat types. Potential effects of the project on vegetation and wildlife are discussed and compared to the effects identified in the 1998 EIS/ EIR, 2004 EA, and 2004 SEIR.

In this section, the "study area" includes both the project impact area and the adjacent buffer area, and hereafter is simply referred to as "study area" when there is no need to distinguish between the two areas.

HDR biologists conducted a database search and biological surveys of the study area. The biological surveys conducted for this EA/IS included general biological surveys, botanical surveys, and a wetland delineation. Biological surveys were conducted on April 23, May 2, May 5, and May 16, 2008. The study area was surveyed by walking along the south bank of Unionhouse Creek and visually scanning the bed and banks of the creek, using binoculars where necessary.

### **3.2.1 Existing Conditions**

**Environmental Setting.** Unionhouse Creek is located in southern Sacramento County on land owned and managed by the City of Sacramento. The study area is located in an urban setting surrounded primarily by residential development. East of Franklin Boulevard, the study area is surrounded by developed land with an adjacent residential development lying to the north. Cosumnes River Boulevard and more residential development lie to the south. West of Franklin Boulevard, Unionhouse Creek flows along the northern edge of the Bufferlands, property that is owned and managed by the SRCSD. The Bufferlands is a 2,650 acre preserve managed by SRCSD to provide a buffer between the Regional Wastewater Treatment Plant and surrounding neighborhoods, as well as habitat for over 200 bird species and other special-status wetland species. The largest land cover type in the Bufferlands is annual grassland habitat, which provides habitat for numerous terrestrial wildlife species as well as valuable foraging habitat for raptors and other bird species. The Bufferlands also contains lakes, creeks, wetlands, and vernal pools that provide valuable aquatic habitat for fish, reptiles, amphibians, waterfowl, and shorebirds.

There are three different land cover types in the study area: two terrestrial habitat types and one aquatic habitat type. Terrestrial habitats occurring in the study area include disturbed habitat and improved areas such as bridges. The aquatic habitat is perennial drainage, consisting of Unionhouse Creek (formerly called Beacon Creek). Four wetlands occur adjacent to the south bank of Unionhouse Creek outside of the study area but within 250 feet. These features are also discussed below due to their proximity to construction. Land cover types in the study area and common wildlife species associated with each land cover type are described below. A habitat map of the study area and immediate vicinity is in Plates 5a and 5b. Photos of the study area are in Plate 6. Sensitive natural communities are land cover types that are especially diverse, regionally uncommon, or of special concern to Federal, State, and local agencies. Unionhouse Creek is considered a waters of the U.S. and a sensitive natural community. The other wetland features adjacent to the study area are considered a potential waters of the U.S but have not been delineated by the USFWS. However, because these wetland features are adjacent to Unionhouse Creek, they are also considered sensitive natural communities.

Table 3.2.1 at the end of this section summarizes the habitat types and acreages in the study area. A complete list of plant and animal species observed in the study area is included as Appendix C.

## Terrestrial Habitat Types

***Disturbed habitat.*** This habitat type occurs along the banks of Unionhouse Creek in the project impact area. This habitat also occurs in the adjacent buffer area between Unionhouse Creek and Cosumnes River Boulevard. (Plates 5a and 5b). There are approximately 8.13 acres of disturbed habitat within the project impact area. An additional 6.6 acres of disturbed habitat occur in the buffer area.

The disturbed habitat is vegetated primarily with non-native grasses and forbs typical of disturbed areas such as wild oat (*Avena* sp.), bromes (*Bromus* spp.), barley (*Hordeum* spp.), wild radish (*Raphanus sativa*), and fennel (*Foeniculum vulgare*). Some herbaceous hydrophytic species occur intermittently in the disturbed habitat along the lower portions of the creek banks adjacent to the concrete lined low flow channel. The hydrophytic vegetation is included in the disturbed habitat rather than as part of the channel because it is growing out of the bank and not in the channel itself. Because it is growing out of the bank, it is mowed regularly. Species observed along the edge of the existing channel include water primrose (*Ludwigia* sp.), sedge (*Cyperus* sp.), and curly dock (*Rumex crispus*). Some wildlife species that are tolerant of high levels of human disturbance utilize this habitat type for foraging and cover. Several bird species were observed in this habitat including black phoebe (*Sayornis nigricans*), yellow-billed magpie (*Pica nuttallii*), western kingbird (*Tyrannus verticalis*), house sparrow (*Passer domesticus*), and mourning dove (*Zenaida macroura*). Small mammals, such as voles (*Microtus* spp.), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*) and some reptiles, such as northwestern fence lizard (*Sceloporus occidentalis*) and common garter snake (*Thamnophis sirtalis*), are expected to live in Unionhouse Creek or use it for a dispersal corridor.

***Improved areas.*** Improved areas, totaling approximately 0.35 acres, consist of two bridges over Unionhouse Creek in the study area: the Franklin Boulevard Bridge and the Center Parkway Bridge (Plates 5a and 5b). These bridge structures provide nesting habitat for migratory birds including swallows and black phoebes.

## Potential Wetlands and Other Waters of the U.S.

***Perennial drainage.*** Unionhouse Creek (known as “Beacon Creek” on the USGS Florin 7.5 minute quadrangle) is mapped as a perennial drainage by USGS. The National Wetland Inventory map lists Unionhouse Creek as palustrine emergent wetland, excavated and temporarily flooded. Unionhouse Creek is a channelized flood control drainage with a concrete lined low flow channel in the study area. The low flow channel of Unionhouse Creek contained approximately 2-4 inches of flowing water during all biological surveys of the study area, which is assumed to be urban runoff. Limited vegetation is associated with the channel and includes species such as water primrose (*Ludwigia* sp.), sedge (*Cyperus* sp.), and dock (*Rumex* sp.). Vegetation is cleared from the channel on an annual basis to improve water flow, however large patches of water primrose were observed in the bottom of the channel during a site visit on June 26, 2008 (Plate 6; photo 6) indicating that vegetative cover does exist in the channel during the summer. The banks of the channel are earthen and vegetated with ruderal species typical of disturbed habitats. Approximately 1.60 acres of perennial drainage habitat occurs in the study

area (Plates 5a and 5b). The perennial drainage habitat is the 12 foot wide concrete lined low flow channel of Unionhouse Creek.

**Table 3.1 Habitat Types in the Study Area**

	Habitat Type	Area (Acres)
<b>Project Impact Area</b>		
	Disturbed Habitat on the banks of Unionhouse Creek within the creek corridor	7.62
	Disturbed Habitat south of the Unionhouse Creek corridor	0.51
	Perennial Drainage	1.60
	Improved areas	0.35
<b>Buffer Area</b>	Disturbed Habitat	6.6

**Seasonal wetland.** Four seasonal wetlands occur outside of the study area but within 250 feet (Plate 5a). One of these wetlands, referred to in this document as Wetland A, was mapped as a jurisdictional waters of the U.S. in a delineation prepared by USFWS in 2005. The other three wetlands (B, C, and D) have not been delineated by the USFWS and a jurisdictional determination has not been made for these wetlands. However, these wetlands are likely jurisdictional because they have a hydrologic connection to Wetland A.

Wetland A occurs adjacent to the south bank of Unionhouse Creek downstream of Franklin Boulevard. Wetland A is in a low point in the topography and appears to be fed by sheet flow from the surrounding uplands as well as three excavated wetland swales (Wetlands B, C, and D) that carry road runoff from Franklin Boulevard. Wetland A contained several inches of water during all biological surveys of the study area. Plant species observed in Wetland A at the time of the survey included curly dock, Italian ryegrass, fireweed (*Epilobium* sp.), and loosestrife (*Lythrum hyssopifolia*). Wetland B, which is vegetated primarily with Italian ryegrass, was dry at the time of the survey. Wetlands C and D, which are connected to each other via a culvert under an access road, are mostly unvegetated and were also dry at the time of the survey. The acreage of these four wetlands is included in Table 3.2.2 below.

**Table 3.2 Acreage of Wetlands Within 250 feet of the Study Area**

	Area (Square Feet)	Area (Acres)
<b>Wetland A</b>	21,780	0.5
<b>Wetland B</b>	220	0.005
<b>Wetland C</b>	1,050	0.024
<b>Wetland D</b>	800	0.018
<b>Total</b>	<b>23,850</b>	<b>0.547</b>

### 3.2.2 Environmental Effects

**Basis of Significance.** Adverse effects on vegetation and wildlife were considered significant if an alternative would result in any of the following:

- Substantial loss of native vegetation or native vegetation communities.

- Conflict with any local policies or ordinances protecting biological resources such as the Sacramento County Tree Preservation Ordinance;
- Substantial adverse impact on a sensitive natural community including federally protected wetlands and other waters of the U.S. as defined by Section 404 of the Clean Water Act (CWA) including seasonal wetlands, vernal pools, and Unionhouse Creek through direct removal, filling, hydrologic interruption, or other means.
- Substantial reduction in the quality or quantity of important habitat or access to such habitat for wildlife species.
- Substantial net loss of important wildlife habitat over the project life as compared to the existing conditions.

**No Action Alternative.** There would be no effect to existing vegetation or wildlife in the study area under this alternative. The type of plant communities and wildlife habitats on site would remain the same.

**Construct Unionhouse Creek Channel Upgrades.** A major difference in the 1998 EIS/EIR, the 2004 EA, and the 2004 SEIR and the proposed channel upgrades is the construction of a rectangular concrete-lined channel for the segment of Unionhouse Creek in the study area. The rectangular concrete-lined channel concept was identified in the 1998 EIS/EIR as an alternative that was considered but eliminated from further consideration due to the high cost of construction and potential environmental effects. This difference in project design is significant and therefore is discussed in detail below.

Construction activities would impact approximately 7.62 acres of the banks of Unionhouse Creek. This area currently consists of disturbed habitat and will be affected by the concrete lining of the channel. Of this, 5.62 acres will be permanently impacted and 2.0 acres will be temporarily impacted. Construction would also temporarily impact 1.60 acres of aquatic open water habitat in the existing concrete lined low flow channel portion of Unionhouse Creek and permanently reduce the quality of the habitat. Although the aquatic open water habitat will be replaced once the new channel is constructed, the new aquatic open water habitat is expected to provide lower quality habitat than the existing conditions. The removal of vegetation on the banks will result in a decrease in cover along the edge of the channel as well as a decrease in the input of organic material into the channel (including vegetative material and animal material) which provides food for aquatic invertebrates and other aquatic species.

Approximately 2.0 acres of the total 7.62 acres of disturbed habitat that will be impacted on the banks of Unionhouse Creek will be reseeded with native grasses and forbs in the location of the vegetated swale. This reseeded area will replace a portion of the habitat value lost by construction of the project as it relates to common wildlife species. The net loss of approximately 5.62 acres of disturbed habitat would be less than significant due to its low habitat value and the abundance of this habitat type in the vicinity. Table 3.2.3 below summarizes habitat impacts as a result of the proposed project and identifies whether the impact is temporary or permanent.

**Table 3.2.3 Habitat Impacts**

	<b>Habitat Type</b>	<b>Existing Area (Acres)</b>	<b>Area of Impact/ Type</b>
<b>Project Impact Area</b>			
68 ft wide Unionhouse Creek corridor	Disturbed Habitat on Creek banks	7.62	5.62 acres/ Permanent and 2.0 acres/ Temporary
	Perennial Drainage	1.60	1.60 acres/ Temporary
	Improved areas	0.35	No impact
South of Unionhouse Creek corridor	Disturbed Habitat outside Creek	0.51	0.51 acres/ Permanent
<b>Buffer Area</b>	Disturbed Habitat	6.6	≤ 6.6 acres/ Temporary

### **3.2.3 Mitigation**

Any previously identified disturbed habitat temporarily impacted by construction would be restored by reseeding the affected area with native grasses and forbs after construction. The temporary loss of disturbed habitat indicated above in Table 3.2.2 would be less than significant due to the abundance of these habitat types in the vicinity.

Avoidance and minimization measures in the form of BMPs would be implemented for the wetland features adjacent to the south bank of Unionhouse Creek in the study area. As stated in the 1998 EIS/EIR, loss of wetland habitats will be compensated for to the degree needed to replace the functional values supported by this habitat. A Habitat Evaluation Procedure (HEP) analysis was performed in 1998 to determine the functional values of wetlands and waters of the U.S. and compensation acreage necessary to offset the loss of these values. A similar analysis should be performed and, if determined appropriate, possible mitigation strategies would be identified, which could include purchasing habitat in a suitable offsite mitigation bank to compensate for any potential impacts to waters of the U.S. as a result of the project. With the implementation of proposed mitigation measures, the project would have a less than significant impact on vegetation and wildlife resources, including waters of the U.S.

### **3.3 Special Status Species**

Special-status species are those plants and animals recognized by Federal, State, or other agencies or organizations as deserving special consideration because of their rarity or vulnerability to extinction due to habitat loss or population decline. This section discusses special status species that either occur or have the potential to occur in the project area and could potentially be impacted by the project.

#### **3.3.1 Existing Conditions**

**Regulatory Setting.** Certain special status species and their habitats are protected by Federal, State, or local laws and agency regulations. The Federal Endangered Species Act (FESA) of 1973 (50 CFR 17) provides legal protection for plant and animal species in danger of extinction. This act is administered by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The California Endangered Species Act (CESA) of 1977 parallels FESA

and is administered by the California Department of Fish and Game (CDFG). Other special status species lack legal protection, but have been characterized as “sensitive” based on policies and expertise of agencies or private organizations, or policies adopted by local government. Special-status species are those that meet any of the following criteria:

- Listed or candidate for listing under the Federal Endangered Species Act of 1973 (50 CFR 17).
- Listed or candidate for listing under the California Endangered Species Act of 1977.
- Nesting bird species and active nests of birds listed under the Migratory Bird Treaty Act.
- Species listed in the Bald and Golden Eagle Protection Act.
- Fully protected or protected species under stated CDFG code.
- Wildlife species of special concern listed by the CDFG.
- Plant species listed as Rare under the California Native Plant Protection Act.
- Plant species listed by the California Native Plant Society.
- Species protected by local ordinances such as the Sacramento County Ordinance, Chapter 19.12, Tree Preservation and Protection.
- Species protected by goals and policies of local plans such as the Bufferlands Master Plan.
- Essential Fish Habitat listed under the Magnuson-Stevens Act.
- Essential Fish Habitat is defined in the Magnuson-Stevens Act as “. . . those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The act requires that Federal agencies consult with the National Marine Fisheries Service when any activity proposed to be permitted, funded, or undertaken by a Federal agency may have adverse effects on designated Essential Fish Habitat.

### **Special-Status Species Evaluation**

Discussions of biological resources have been provided in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR (Corps, 1998 and 2004b). Analysis of special-status species with the potential to be impacted by the overall South Sacramento County Streams Project were conducted in preparation of these previous documents. In addition, environmental studies have been conducted for three other projects in the Bufferlands adjacent to the western portion of the study area including the RT South Line Extension Supplemental Draft EIS/Subsequent Draft EIR Draft Section 4(f) prepared in January 2007, the Interstate 5/Cosumnes River Boulevard Interchange Project Revised Draft EIR prepared in December 2006, and the Freeport Regional Water Authority Project EIR/EIS prepared in 2004. These documents were reviewed to obtain background information for the preparation of this EA/IS. Full studies for biological resources and potential wetlands and other waters of the U.S. were also conducted for this project.

HDR biologists conducted a database search and biological surveys of the study area. The biological surveys conducted for this EA/IS included general biological surveys, botanical surveys, and a wetland delineation. Biological surveys were conducted on April 23, May 2, May 5, and May 16, 2008. The study area was surveyed by walking along the south bank of

Unionhouse Creek and visually scanning the bed and banks of the creek, using binoculars where necessary. The database search consisted of obtaining a list of Federally-listed endangered, threatened, and candidate species that may be affected by projects in the Florin USGS quad on April 30, 2008 via the USFWS website. In addition, a search of the California Natural Diversity Database (CNDDDB) for the Florin USGS quad was conducted on May 16, 2008. The CNDDDB search indicated that there were no reported occurrences of Federal or State-listed special-status species in the study area. The USFWS and CNDDDB lists are included in Appendix A. A list of regionally occurring special-status species was compiled from the USFWS and CNDDDB lists and is included in Appendix B. The list of regionally-occurring special-status species was compared to the habitats observed in the study area during surveys. Special-status species that were not identified as occurring or having habitat in the project area are not discussed in detail in this document. The Coordination Act Report provided in Appendix D was also reviewed for special-status species. Table 3.3.1 lists the Federal and State listed special-status species that were identified as having the potential to occur in the study area or the immediate vicinity and could be impacted by construction activities.

**Table 3.3 Regionally Occurring Special Status Species with the Potential to be Impacted by the Proposed Project**

Species	Status: Federal/ State/ CNPS	General Habitat	Potential to Occur
<b>Animals</b>			
<b><i>Invertebrates</i></b>			
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FT/--/--	A variety of vernal pool and other seasonally ponded habitats.	<b>Medium.</b> The seasonal wetland adjacent to the south bank of Unionhouse Creek provides marginal habitat for this species. Several reported occurrences on the Florin USGS quad.
<i>Branchinecta mesovallensis</i> Midvalley fairy shrimp	--/SSC/--	A variety of vernal pool and other seasonally ponded habitats.	<b>Medium.</b> The seasonal wetland adjacent to the south bank of Unionhouse Creek provides marginal habitat for this species. Several reported occurrences on the Florin USGS quad.
<i>Lepidurus packardi</i> Vernal pool tadpole shrimp	FE/--/--	A variety of vernal pool and other seasonally ponded habitats.	<b>Medium.</b> The seasonal wetland adjacent to the south bank of Unionhouse Creek provides marginal habitat for this species. Several reported occurrences on the Florin USGS quad.
<b><i>Amphibians</i></b>			
<i>Ambystoma californiense</i> California tiger	FT/SSC/--	Grassland and pool complexes	<b>Low.</b> The seasonal wetland adjacent to the

Species	Status: Federal/ State/ CNPS	General Habitat	Potential to Occur
salamander		in the Central Valley and North and Central Coast regions.	south bank of Unionhouse Creek may provide marginal habitat for this species. No reported occurrences on the Florin USGS quad.
<b>Reptiles</b>			
<i>Thamnophis gigas</i> Giant Garter Snake	FT/ST/--	Marshes, sloughs, drainage ditches, and creeks containing suitable cover, often associated with rice fields.	<b>Medium.</b> Unionhouse Creek provides a dispersal corridor for this species during flood events. No documented occurrences in Unionhouse Creek.
<b>Mammals</b>			
<i>Antrozous pallidus</i> Pallid bat	--/SSC/--	Roosts in caves, rock crevices, buildings, on the undersides of bridges in a variety of habitats.	<b>Medium.</b> Bridges in the study area provide potential roosting habitat for this species.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	--/SSC/--	Roosts in caves, trees, buildings, lava tubes, and on the undersides of bridges in a variety of habitats.	<b>Medium.</b> Bridges in the study area provide potential roosting habitat for this species.
<b>Birds</b>			
<i>Accipiter cooperii</i> Cooper's hawk	--/SSC/--	Nests in medium to tall trees usually located in a riparian or wooded area.	<b>High.</b> Potential nesting and foraging habitat for this species occurs in and adjacent to the study area. This species was observed adjacent to the study area during surveys.
<i>Athene cunicularia</i> Burrowing owl	--/SSC/--	Grasslands or other habitats with low growing vegetation and mammal burrows for denning.	<b>High.</b> Potential nesting and foraging habitat for this species occurs in and adjacent to the study area. This species is known to occur along the banks of Unionhouse Creek in the Bufferlands.
<i>Buteo swainsoni</i>	--/ST/--	Nests in large	<b>High.</b> Potential nesting

Species	Status: Federal/ State/ CNPS	General Habitat	Potential to Occur
Swainson's hawk		trees in open areas adjacent to suitable foraging habitat such as grasslands, grain or alfalfa fields, or livestock pastures.	and foraging habitat for this species occurs adjacent to the study area. This species was observed adjacent to the study area during surveys.
<i>Elanus leucurus</i> White-tailed kite	--/FP/--	Nests in medium to tall trees in foothill or valley grasslands, as well as in lowlands next to marsh or riparian habitat.	<b>High.</b> Potential nesting and foraging habitat for this species occurs adjacent to the study area. This species was observed adjacent to the study area during surveys.
<b>Plants</b>			
<i>Sagittaria sanfordii</i> Sanford's arrowhead	--/--/1B.2	Assorted, shallow, freshwater, marshes and swamps including sloughs and drainage ditches.	<b>Low.</b> There are reported occurrences of this species on the Florin quad, however it was not observed in the study area during surveys.
<b>Listing Status:</b>  <b>Federal Listing Status under the Federal Endangered Species Act</b> FE = Federal Endangered FT = Federal Threatened SSC = State Species of Special Concern		<b>State Listing Status under the California Endangered Species Act</b> ST = State Threatened FP = Fully Protected  <b>California Native Plant Society (CNPS) Listing Status</b> 1B = Rare, threatened, or endangered in California and elsewhere 1B.2 = Fairly endangered in California (20-80% occurrences threatened)	

The list of special-status species with the potential to occur in the Unionhouse Creek Channel Upgrades study area obtained from the USFWS, CNDDDB, and CNPS database searches was compared to the lists of special-status species identified in the 1998 EIS/EIR and 2004 SEIR as having the potential to occur in the overall project area. One bird species was identified during the database searches conducted for this study as having the potential to occur in the project area that was not identified in the 1998 EIS/EIR and 2004 SEIR: Cooper's hawk (CA species of concern).

The following species were identified in the 1998 EIS/EIR as having the potential to be affected by the overall South Sacramento County Streams Project: Delta smelt, winter-run

Chinook salmon, giant garter snake, American peregrine falcon, Swainson's hawk, burrowing owl, vernal pool fairy shrimp, vernal pool tadpole shrimp, northwestern pond turtle, and Sanford's arrowhead.

The 2004 SEIR identified several new species as having the potential to be affected by the overall South Sacramento County Streams Project: California tiger salamander, conservancy fairy shrimp, Valley elderberry longhorn beetle, Boggs lake hedge-hyssop, slender Orcutt grass, Sacramento Orcutt grass, Crampton's tuctoria, pallid bat, long-eared myotis bat, tri-colored blackbird, white-tailed kite, loggerhead shrike, California horned lizard, western spadefoot, midvalley fairy shrimp, Suisun marsh aster, dwarf downingia, rose-mallow, Ahart's dwarf rush, Delta tule pea, legenere, pincushion navarretia, and blue skullcap.

Based on the specific habitat requirements of the above-listed special-status species, it was determined that there was no habitat present in the Unionhouse Creek Channel Upgrades study area for the following species and they are not discussed further in this document: Delta smelt, winter-run Chinook salmon, American peregrine falcon, northwestern pond turtle, conservancy fairy shrimp, Valley elderberry longhorn beetle, long-eared myotis bat, tri-colored blackbird, loggerhead shrike, California horned lizard, western spadefoot, Boggs lake hedge-hyssop, slender Orcutt grass, Sacramento Orcutt grass, Crampton's tuctoria, Suisun marsh aster, dwarf downingia, rose-mallow, Ahart's dwarf rush, Delta tule pea, legenere, pincushion navarretia, and blue skullcap. Species with potential to occur in the study area are discussed in the following paragraphs.

***Native Oak Trees.*** The Sacramento County Ordinance, Chapter 19.12, Tree Preservation and Protection (Oak tree ordinance), regulates the removal or disturbance of all species of oak trees native to Sacramento County. These species include valley oak, interior live oak, blue oak, oracle oak, and black oak. The ordinance applies to any native oak tree. No native oak trees occur in the study area.

***Vernal Pool Fairy Shrimp (Branchinecta lynchi).*** The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, including one exceeding 25 acres, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.05 acre. These are most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. Vernal pool fairy shrimp is currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California (USFWS, 2005).

There are five recorded occurrences in CNDDDB of vernal pool fairy shrimp on the Florin USGS quad. The closest recorded occurrence to the study area is in a vernal pool complex located along the west side of the UPRR tracks less than one mile west of the study area. The seasonal wetland located along the south bank of Unionhouse Creek adjacent to the study area provides marginal habitat for this species. Fairy shrimp disperse passively during the "resting egg" stage on the feet and in the guts of birds and on the feet of other animals, as well as via wind. Vernal pool fairy shrimp cysts could passively disperse into the seasonal wetland from known populations in the vicinity.

**Midvalley Fairy Shrimp (*Branchinecta mesovallensis*).** This species inhabits shallow ephemeral pools, vernal swales, and various artificial ephemeral wetland habitats in the central portion of the Central Valley (USFWS, 2005).

There are nine recorded occurrences in CNDDDB of midvalley fairy shrimp on the Florin USGS quad. The closest recorded occurrence to the study area is in a vernal pool complex located along the west side of the UPRR tracks less than one mile west of the study area. The seasonal wetland located along the south bank of Unionhouse Creek adjacent to the study area provides marginal habitat for this species. Fairy shrimp disperse passively during the “resting egg” stage on the feet and in the guts of birds and on the feet of other animals, as well as via wind. Midvalley fairy shrimp cysts could passively disperse into the seasonal wetland from known populations in the vicinity.

**Vernal pool tadpole shrimp (*Lepidurus packardii*).** This species inhabits vernal pools and swales containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie. Pools range from grass-bottomed pools in unplowed grasslands to highly turbid mud-bottomed pools. This species is also often found in manmade ditches along roadsides or railroad tracks in the vicinity of other occurrences. The vernal pool tadpole shrimp is currently distributed across the Central Valley of California and in the San Francisco Bay area (USFWS, 2005).

There are 12 recorded occurrences in the CNDDDB of vernal pool tadpole shrimp on the Florin USGS quad. Six of these occurrences are in roadside ditches and other man-made ditches. The closest recorded occurrence to the study area is in a vernal pool complex located along the west side of the UPRR tracks less than one mile west of the study area. There are also recorded occurrences of this species approximately two miles south of the study area south of Sims Road between Franklin Boulevard and the UPRR tracks. Vernal pool tadpole shrimp occurs in vernal pools and roadside ditches in this location. The seasonal wetland located along the south bank of Unionhouse Creek adjacent to the study area provides marginal habitat for this species. Tadpole shrimp disperse passively during the “resting egg” stage on the feet and in the guts of birds and on the feet of other animals, as well as via wind. Vernal pool tadpole shrimp cysts could passively disperse into the seasonal wetland from known populations in the vicinity.

**California tiger salamander (*Ambystoma californiense*).** California tiger salamanders have a two part life cycle with an aquatic larval stage and a terrestrial adult stage. Adults travel to breeding sites, mate, and lay eggs after the ponds have filled up from winter rains. The adults then leave the pools. With the exception of breeding activity and occasional dispersal trips overland during rains, the adults spend their time underground. The larvae typically require 100-120 days or more to complete metamorphosis, after which time they leave their natal pools and seek suitable underground refugia. California tiger salamanders typically breed in vernal pools and seasonal ponds, including many constructed stockponds, in grassland and oak savannah plant communities from sea level to about 1,500 feet in central California. Adults utilize mammal burrows in upland areas for refugia during dry periods. In the Coastal region, populations are scattered from Sonoma County in the northern San Francisco Bay Area to Santa Barbara County,

and in the Central Valley and Sierra Nevada foothills from Yolo to Kern counties (USFWS, 2008).

The study area is located within the current range of California tiger salamander according to the CDFG's California Wildlife Habitat Relationships System (CWHR). California tiger salamander is considered by the Sacramento Fish and Wildlife Office as having the potential to occur in or be affected by projects in the Florin quad (Appendix A). There are no reported occurrences of California tiger salamander in CNDDDB for the Florin USGS quad and this species has not been observed on the Bufferlands property. The closest documented occurrence of this species is approximately 15 miles southeast of the study area on the Galt quad where this species was observed in 1914. This occurrence is considered extirpated. The seasonal wetland located along the south bank of Unionhouse Creek adjacent to the study area may provide potential breeding habitat for California tiger salamander and the annual grassland habitat may provide upland refugia. California tiger salamander could potentially occupy suitable habitat adjacent to the study area including the large seasonal wetland adjacent to the south side of Unionhouse Creek as well as mammal burrows along the south bank of the creek.

***Giant Garter Snake (*Thamnophis gigas*)***. Giant Garter Snake (GGS) inhabit agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley. Because of the direct loss of natural habitat, the GGS relies heavily on rice fields in the Sacramento Valley, but also uses managed marsh areas in Federal National Wildlife Refuges and State Wildlife Areas. Habitat requirements consist of (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and, (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter. GGS are typically absent from larger rivers because of lack of suitable habitat and emergent vegetative cover, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations. GGS feed primarily on small fishes, tadpoles, and frogs. The GGS inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period. GGS typically select burrows with sunny exposure along south and west facing slopes.

There are six reported occurrences of giant garter snakes in CNDDDB on the Florin USGS quad. There is one reported occurrence in Elk Grove Creek 0.4 miles west of 99 and 0.5 miles north of Elk Grove Boulevard; one in Laguna Marsh; one in Beach Lake; two in Laguna creek - both in the vicinity of the confluence marsh at the junction of Laguna creek and Elk Grove creek; and one in lower Morrison creek south of Beach Lake and west of I-5. The majority of the sightings in the region are from the 1980's and early 1990's. However, one of the giant garter snake sightings in Laguna Creek is from 2005.

A report done by George Hansen for the 1998 EIS/ EIR (Corps, 1998) concluded that giant garter snakes may venture into Unionhouse Creek from more suitable habitats during downstream flooding or other dispersal activities, but that the long-term survival of giant garter

snakes in Unionhouse Creek was unlikely. Unionhouse Creek lacks suitable cover for the snake and does not provide a sufficient prey base. Known occurrences of the snake in the watershed occur southwest of Unionhouse Creek in the vicinity of Beach and Stone lakes and southeast in Laguna and Elk Grove creeks where suitable habitat for the snake occurs. These sightings are all in water bodies that meet the habitat requirements of the species including cover such as cattails and willows and sufficient water to provide cover and a prey base for the snake.

***Pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*)***. Pallid bat is found in deserts, grasslands, shrublands, woodlands, and forests. It is most common in open dry habitats with rocky areas for roosting. Pallid bat feeds mainly in open areas on beetles and other large insects, often landing on the ground to catch prey. Roosting habitats suitable for pallid bat include caves, rock crevices, buildings, and the undersides of bridges. In order for roosts to be suitable for pallid bat they must adequately protect roosting individuals from high temperatures. Pallid bat is extremely sensitive to human disturbance of roosting sites. Townsend's big-eared bat is found throughout California in nearly all habitats except alpine and subalpine zones. This species is typically associated with caves or cave-like structures, which it usually uses for roosting habitat. However, this species has been reported roosting in large hollows of redwood trees, in attics and abandoned buildings, in lava tubes, and under bridges (Gruver and Keinath, 2006).

There are no reported occurrences of pallid bat or Townsend's big-eared bat on the Florin USGS quad and no bats were observed during surveys.

***Cooper's hawk (*Accipiter cooperii*)***. Cooper's hawk nest in deciduous trees or conifers in crotches or cavities that are usually 20 to 50 feet off the ground. The nest is a stick platform lined with bark. Nests are usually placed in second growth coniferous stands or in the deciduous riparian areas that are closest to streams.

There is one record for nesting Cooper's hawk in CNDDDB on the Florin USGS quad. The nest record is from 2005 and is located approximately 1.7 miles south of the study area in the Bufferlands property near Sims Road. Two young hawks were successfully fledged from this nest in 2005. The annual grassland adjacent to the study area provides potential nesting and foraging habitat for Cooper's hawk. A Cooper's hawk was observed foraging over the annual grassland adjacent to the study area during the biological surveys conducted for this project, but no potential nests were observed in or adjacent to the study area.

***Burrowing owl (*Athene cunicularia*)***. Burrowing owls are often found in open, dry grasslands, agricultural and range lands, and desert habitats. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. Burrowing owls occur at elevations ranging from 200 feet below sea level to over 9,000 feet. In California, the highest elevation where burrowing owls are known to occur is 5,300 feet above sea level in Lassen County. In addition to natural habitats, burrowing owls can be found in urban habitats such as at the margins of airports, golf courses and in vacant urban lots. Burrowing owls nest in burrows in the ground, often in old ground squirrel burrows or badger dens. They are also known to use artificial burrows such as abandoned pipes or culverts. The nesting season for burrowing owls can begin as early as February 1 and continues through August 31. The owl commonly perches on fence

posts or on top of mounds outside its burrow. Burrowing owls forage in adjacent grasslands and other suitable habitats primarily for insects and small mammals, and less often for reptiles, amphibians, and other small birds.

There are 11 records for nesting burrowing owls in CNDDDB on the Florin USGS quad. The closest record is located on the south bank of Unionhouse Creek adjacent to the study area. Several burrowing owls were observed nesting in this location on October 13, 2005. Two other nest records also occur in the Bufferlands property. As many as 18 pairs of burrowing owls have been identified nesting on the Bufferlands in a single season (SRCSD, 2000). Locations on the Bufferlands that are or have been occupied by burrowing owls include the northeastern portion of the Bufferlands in the vicinity of the study area, the area along the UPRR tracks, the plant process area, and areas south in the vicinity of North Beach Lake (SRCSD, 2000).

Although no burrowing owls were observed nesting in or adjacent to the study area, there is potential nesting and foraging habitat for this species along the banks and adjacent to Unionhouse Creek. SRCSD is actively conducting burrowing owl exclusion for the 2008 nesting season in the northeast portion of the Bufferlands in the vicinity of the study area to prevent impacts to nesting burrowing owls as a result of current construction projects. Burrowing owl exclusion is not being conducted along Unionhouse Creek east of Franklin Boulevard. There are no nesting records for burrowing owls along Unionhouse Creek between Franklin Boulevard and Center Parkway. However, burrowing owls currently being excluded from the south bank of Unionhouse Creek in the Bufferlands, could potentially begin nesting in the study area.

***Swainson's hawk (Buteo swainsoni)***. Swainson's hawk is an uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and the Mojave Desert. Swainson's hawk breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley and forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Swainson's hawks breed in California and over winter in Mexico and South America. Swainson's hawks usually arrive in the Central Valley between March 1 and April 1, and migrate south between September and October. Swainson's hawks nests usually occur in trees near the edges of riparian stands, in lone trees or groves of trees in agricultural fields, and in mature roadside trees. Valley oak, Fremont cottonwood, walnut, and large willow with an average height of about 58 feet, and ranging from 41 to 82 feet, are the most commonly used nest trees in the Central Valley. Suitable foraging areas for Swainson's hawk include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Swainson's hawks primarily feed on voles; however, they will feed on a variety of prey including small mammals, birds, and insects.

There are 11 reported occurrences of Swainson's hawk in CNDDDB on the Florin USGS quad. The two closest nest records to the study area are located on the Bufferlands property to the southwest. The closest record is approximately 0.8 miles southwest of the study area where Swainson's hawk was last reported nesting in 2002. The other record is approximately 1.2 miles southwest of the study area where Swainson's hawk was last reported nesting in 2004. The annual grassland adjacent to the study area provides potential foraging habitat for Swainson's hawk. A Swainson's hawk was observed foraging over the annual grassland adjacent to the study area, but no potential nests were observed in or adjacent to the study area.

**White-tailed Kite (*Elanus leucurus*).** The white-tailed kite is a common to uncommon, yearlong resident in coastal and valley lowlands and is rarely found away from agricultural areas. However, it does inhabit herbaceous and open stages of most habitats, mostly west of the Sierra Nevada. The main prey of the white-tailed kite is voles and other small, diurnal mammals, but it occasionally preys on birds, insects, reptiles, and amphibians. White-tailed kite forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands. Nests are made of loosely piled sticks and twigs and lined with grass, straw, or rootlets and placed near the top of a dense oak, willow, or other tree stand; usually 20-100 ft above ground. Nests are located near open foraging areas in lowland grasslands, agricultural areas, wetlands, oak-woodland and savannah habitats, and riparian areas associated with open areas.

There are no reported occurrences of nesting white-tailed kite in CNDDDB for the Florin USGS quad. However, a pair of white-tailed kites was observed nesting in a pine tree on the north side of Unionhouse Creek approximately 1,700 feet west of the study area. The nesting white-tailed kites were observed on all survey dates (April 23, May 2, May 5, and May 16, 2008). A white-tailed kite nest record was submitted to CNDDDB in late April, 2008. White-tailed kite have been observed nesting in this tree for the past two years (Pers. comm. Jennifer Albright). Numerous other trees in the vicinity of the study area provide nesting habitat for white-tailed kite and the annual grassland adjacent to the study area provides foraging habitat.

**Swallows, Black Phoebes, and Other Migratory Birds.** Swallows, black phoebes, and other migratory birds commonly nest on the underside of bridges and other structures in the vicinity of streams and other watercourses. These species are protected from disturbance during the nesting season by the Migratory Bird Treaty Act (MBTA). Swallow and black phoebe nests were observed on the undersides of the Franklin Boulevard and Center Parkway bridges over Unionhouse Creek and numerous swallows were observed flying around the bridges during biological surveys.

**Sanford's arrowhead (*Sagittaria sanfordii*).** Sanford's arrowhead is an emergent perennial herb found in assorted, shallow, freshwater marshes and swamps including sloughs and drainage ditches from 0 to 2,133 ft in elevation. It is currently known to occur in Butte, Del Norte, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, Shasta, San Joaquin, Tehama, and Ventura counties. This species blooms between May and October.

Potential habitat for Sanford's arrowhead occurs in Unionhouse Creek in the study area. There are 11 reported occurrences of Sanford's arrowhead in CNDDDB for the Florin USGS quad. The closest records are one mile north of the study area in Elder Creek. There are also several records for this species in Unionhouse Creek and Strawberry Creek (a tributary to Unionhouse Creek) between one and two miles east of the study area. This species was not observed in Unionhouse Creek during surveys conducted during the bloom season (May to October). Although surveys were conducted early in the bloom season, this perennial herb would have been evident at the time surveys were conducted if it was present in the creek. Therefore, Sanford's arrowhead does not presently occur in the study area.

### 3.3.2 Environmental Effects

**Basis of Significance.** Adverse effects on special status species were considered significant if an alternative would result in any of the following:

- Direct or indirect reduction in the growth, survival, or reproductive success of species listed or proposed for listing as threatened or endangered under the Federal or State Endangered Species Acts.
- Direct mortality, long-term habitat loss, or lowered reproduction success of Federally or State-listed threatened or endangered animal or plant species or candidates for Federal listing.
- Direct or indirect reduction in the growth, survival, or reproductive success of substantial populations of Federal species of concern, State-listed endangered or threatened species, plant species listed by the California Native Plant Society, or species of special concern or regionally important commercial or game species.
- Have an adverse effect on a species' designated critical habitat.

**No Action Alternative.** Under the no action alternative, there would be no effects on existing special status species in the project area. The types of species and their associated habitat would be expected to remain the same.

**Construct Unionhouse Creek Channel Upgrades.** Construction of the Unionhouse Creek Channel Upgrades would directly and indirectly affect the giant garter snake and its habitat and could potentially impact habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, midvalley fairy shrimp, and California tiger salamander. The project could also result in direct and indirect impacts to nesting raptors and other migratory birds including Swainson's hawk, burrowing owl, white-tailed kite, Cooper's hawk, and bridge nesting swallows and black phoebes. These effects would be considered significant to these special status species.

Effects to Vernal Pool Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Midvalley Fairy shrimp: Construction of Unionhouse Creek channel upgrades would occur within 250 feet of potentially occupied habitat and could potentially result in direct and indirect impacts to these vernal pool branchiopods. Construction activity within 250 feet of potential habitat could potentially impact these species through hydrologic disruption or decreased water quality of the seasonal wetlands.

Effects to California Tiger Salamander. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to California tiger salamander. California tiger salamander is not known to occur in the study area, but USFWS protocol surveys have not been conducted for this species. The seasonal wetlands within 250 feet of the impact area may provide potential breeding habitat for this species and the annual grassland may provide potential upland habitat. California tiger salamander could potentially occur in the study area and direct effects could potentially result from the project such as physical harm to individual salamanders during site preparation and construction activities. Indirect effects of the project could potentially include hydrologic disruption or decreased water quality of the seasonal

wetlands, physical vibration of aestivation habitat, and an increase in site disturbance during operation of equipment and trucks during construction activities. These site disturbances could cause salamanders to leave their burrows exposing them to increased chances of predation or other physical harm.

Effects to Giant Garter Snake. Construction of the Unionhouse Creek channel upgrades would potentially result in direct and indirect affects to the giant garter snake. This species is unlikely to reside for long periods of time in the segment of Unionhouse Creek in the study area; however, it could potentially disperse through the study area. In addition, the banks of Unionhouse Creek provide marginal basking habitat and refugia for the giant garter snake. Individual giant garter snakes dispersing through the study area or temporarily utilizing the study area for basking habitat could potentially be harmed during site preparation and construction activities. Potential aquatic dispersal habitat for the snake would be temporarily disturbed during excavation of the existing low flow channel of the creek and the quality of habitat with the new channel would likely be reduced compared to the existing conditions due to a reduction in forage opportunities and cover. Potential upland habitat for the giant garter snake would be permanently lost through concrete lining of Unionhouse Creek in the study area. Concrete lining the banks of Unionhouse Creek will increase the likelihood of fatalities for individual giant garter snakes dispersing through the area for the life of the project. Snakes caught in the creek channel during flood events would be exposed to an increased risk of predation due to a lack of cover as compared to the existing conditions. Due to the rectangular design with vertical walls on both sides of the channel, giant garter snakes dispersing through the project area would likely be confined to the bottom of the channel, lacking escape routes or access to upland habitat. Indirect effects of the project could potentially include physical vibration and an increase in site disturbance during operation of equipment and trucks during construction activities. If construction takes place during the active season for giant garter snakes, these site disturbances could cause snakes to leave their burrows exposing them to increased chances of predation or other physical harm.

Table 3.3.2 summarizes impacts to the giant garter snake habitat as a result of the proposed project.

**Table 3.4 Impacts to Giant Garter Snake Habitat**

	<b>Habitat Type</b>	<b>Existing Area (Acres)</b>	<b>Area of Impact/ Type</b>	<b>Giant Garter Snake Habitat (Yes or No)</b>
<b>Project Impact Area</b>				
68 ft wide Unionhouse Creek corridor	Disturbed Habitat on Creek bank	7.62	7.62 acres/ Permanent	Yes
	Perennial Drainage	1.60	1.60 acres/ Temporary	Yes
	Improved areas	0.35	No impact	No
South of Unionhouse Creek corridor	Disturbed Habitat outside Creek	0.51	0.51 acres/ Permanent	No
<b>Buffer Area</b>	Disturbed Habitat	6.6	≤ 6.6 acres/ Temporary	No
<b>Total Permanent Impacts to Giant Garter Snake Upland Habitat</b>				<b>7.62 acres</b>
<b>Total Temporary Impacts to Giant Garter Snake Aquatic Habitat</b>				<b>1.60 acres</b>

Effects to Pallid bat and Townsend’s big-eared bat. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to these bat species if they begin roosting on the undersides of the Franklin Boulevard or Center Parkway bridges prior to construction.

Effects to Cooper’s Hawk. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to Cooper’s hawk. The closest nest record to the study area for Cooper’s hawk is from 2005 and is located approximately 1.7 miles south of the study area in the Bufferlands property near Sims Road. No Cooper’s hawk nests were observed in or adjacent to the study area. However, construction of the project could potentially result in direct and/or indirect affects to Cooper’s hawk if this species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

Effects to Burrowing Owl. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to the burrowing owl. Burrowing owls have utilized the south bank of Unionhouse Creek in and adjacent to the study area for roosting, nesting, and foraging. Construction of the project could potentially result in direct and/or indirect affects to the burrowing owl if this species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult owls. In addition, concrete lining the banks of the channel would result in a permanent loss of potential burrowing owl nesting and foraging habitat along the project segment of Unionhouse Creek.

Effects to Swainson’s Hawk. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to Swainson’s hawk. Swainson’s hawk has

been reported nesting within one mile of the study area near the water treatment plant. Construction of the project could potentially result in direct and/or indirect affects to Swainson's hawk if this species begins nesting adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

Effects to White-tailed Kite. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to white-tailed kite. As discussed previously, a white-tailed kite nest was observed on the north side of Unionhouse Creek approximately 1,700 feet west of the study area. Construction of the project could potentially result in direct and/or indirect affects to the white-tailed kite if this species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

Effects to Nesting Swallows, Black Phoebes and Other Migratory Birds. Construction of the Unionhouse Creek channel upgrades could potentially result in temporary direct and indirect affects to nesting swallows, black phoebes, and other migratory birds. Swallow nests were observed on the undersides of the Franklin Boulevard and Center Parkway bridges over Unionhouse Creek in the study area during biological surveys. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by these species during the breeding season.

Effects to Sanford's Arrowhead. Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to this species. This species was not observed in the study area, but Unionhouse Creek provides potential habitat and this species could colonize the creek from upstream populations prior to construction. Individuals of this species could be destroyed by construction if it were to colonize the study area prior to construction, which is anticipated to occur in spring/summer of 2009 or 2010.

### **3.3.3 Mitigation**

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. Because construction would occur within 250 feet of potentially occupied habitat for these species, consultation with USFWS has been initiated to determine appropriate mitigation measures for any potential direct and indirect impacts to these species that could occur as a result of the proposed project (Appendix E). Mitigation measures may include, but are not limited to; (1) implementing BMPs and adherence to all project permit requirements to prevent water quality impacts to the seasonal wetland; (2) preservation of seasonal wetland habitat for habitat affected at a ratio of 2:1 at a USFWS approved location, and, (3) other appropriate mitigation as determined by USFWS.

The proposed mitigation would reduce the effects on vernal pool fairy shrimp and vernal pool tadpole shrimp to less than significant.

Midvalley Fairy Shrimp. The proposed mitigation for vernal pool fairy shrimp and vernal pool tadpole shrimp would reduce the effects on midvalley fairy shrimp to less than significant.

California Tiger Salamander. Mitigation measures proposed for vernal pool fairy shrimp and vernal pool tadpole shrimp are expected to reduce the potential effects on California tiger salamander to less than significant. Prior to construction, the habitat suitability of the study area and adjacent wetlands would be determined in consultation with USFWS. If suitable habitat for California tiger salamander is determined to be present, the Corps would consult with USFWS to determine if additional mitigation measures are needed above those included in this document for vernal pool branchiopods. Additional measures may include, but are not limited to: (1) biological monitoring during initial construction activities in suitable habitat for this species; (2) worker awareness training to inform construction personnel of the potential occurrence of California tiger salamander; and, (3) proper procedures for protecting the species if it is observed during construction.

The proposed mitigation would reduce the effects on the California tiger salamander to less than significant.

Giant Garter Snake. Potential aquatic dispersal habitat for the giant garter snake would be temporarily disturbed during excavation of the existing low flow channel and dewatering of the study area. Potential giant garter snake upland bank habitat in the project area would be permanently lost due to concrete lining of the channel banks. The area of the giant garter snake habitat temporarily affected is 1.60 acres of aquatic habitat consisting of the existing concrete lined low flow channel. The area of the giant garter snake habitat permanently lost is 7.62 acres of marginal upland habitat consisting of the existing vegetated banks of Unionhouse Creek. Revegetation of 2.0 acres of habitat along the north bank of Unionhouse Creek for construction of the vegetated swale would not benefit the giant garter snake because it is on the top of bank outside of the rectangular concrete lined channel. The banks of the channel are vertical and range from 17 to 20 feet in height. Giant garter snake individuals potentially dispersing through the creek would not be able to climb out of the channel in the study area and access the revegetated area for basking or refugia. Therefore, all existing bank habitat along Unionhouse Creek that would be impacted due to the construction of the proposed project is considered a permanent loss of giant garter snake upland habitat.

The Corps has re-initiated consultation with USFWS under Section 7 of the Endangered Species Act (Appendix E). The following mitigation measures included in the 2004 SEIR would be implemented. The Corps and the non-federal sponsor will ensure implementation of the respective terms and conditions and reasonable and prudent measures identified in the resulting Biological Opinion once it is received. Construction in aquatic habitat or upland habitat within 200 feet of Unionhouse Creek will conform to the USFWS's *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat*, including the requirement that construction be limited to the period between May 1 and October 1, the active period for the snake. Additional measures such as worker awareness training and biological monitoring for GGS during construction and habitat protection would be implemented as determined appropriate by USFWS. The Corps has proposed to USFWS to also compensate for the permanent loss of 7.62 acres of potential upland giant garter snake habitat through the purchase of credits at a USFWS approved mitigation bank at a 3:1 ratio.

The proposed mitigation would reduce the effects on the giant garter snake to less than significant.

Pallid bat and Townsend's big-eared bat. Preconstruction bat surveys would be conducted to inspect the undersides of the Franklin Boulevard and Center Parkway bridges for roosting bats. If no roosting bats are found, no further mitigation would be necessary. If bats are detected within the roost at the time of construction, excluding any bats from roosts would be accomplished by a bat specialist prior to the onset of any construction activities. Exclusionary devices, such as plastic sheeting, plastic or wire mesh, can be used to allow for bats to exit but not re-enter any occupied roosts. Expanding foam and plywood sheets can be used to prevent bats from entering unoccupied roosts.

The proposed mitigation would reduce the effects on special-status bats to less than significant.

Swainson's Hawk, Burrowing Owl, Cooper's Hawk, White-tailed Kite, and other Raptors. If construction is scheduled to occur between March 15 and September 15, preconstruction surveys would be conducted in suitable nesting habitat within 0.5 miles of the study area for Swainson's hawk, within 1,000 feet of the study area for tree nesting raptors including Cooper's hawk and white-tailed kite, and within 500 feet of the project site for burrowing owls, similar to the 1998 EIS/EIR and the 2004 SEIR.

As stated in the 2004 SEIR, surveys shall conform to the Swainson's Hawk Technical Advisory Committee Guidelines and CDFG burrowing owl recommendations, where feasible. Burrowing owl surveys shall be conducted in both the breeding (April 15 to July 17) and non-breeding (December 1 to January 31) seasons. If nesting raptors are recorded within their respective buffers, CDFG would be consulted regarding suitable measures to avoid impacting breeding effort. Mitigation measures would include but are not limited to the following mitigation measures taken from the 2004 SEIR:

- Maintaining an appropriately sized buffer around each active raptor nest determined in consultation with CDFG; no construction activities will be allowed within this buffer except as allowed through consultation with CDFG.
- Depending on conditions specific to each nest, and the relative location and rate of construction activities, it may be feasible for construction to occur as planned within the buffer without impacting breeding effort. In this case, as determined by consultation with CDFG, the nest(s) shall be monitored by a qualified biologist during construction within the buffer. If the monitoring biologist determines that construction will impact the nest, the biologist shall immediately inform the construction manager and CDFG. Construction activities within the buffer will be stopped until either the nest is no longer active or the project receives approval to continue by CDFG.

The proposed mitigation would reduce the effects on the above-listed special-status raptors to less than significant.

Swallows, Black Phoebe, and Other Migratory Birds. If construction is scheduled to occur during the typical nesting season for these birds, March 1 through September 1, a preconstruction survey would need to be conducted within two weeks prior to construction for nesting birds under the project bridges and in other suitable habitats. If no nests are detected, no further mitigation would be necessary. If active nests are detected, CDFG would need to be contacted to determine appropriate mitigation measures to prevent impacts to nesting birds.

Alternatively, in order to prevent swallows and black phoebes from nesting under the bridge, a nest survey should be conducted prior to the nesting season in the year that construction is scheduled to commence. In consultation with CDFG, the existing unoccupied nests under the bridge should be removed prior to the nesting season by pressure washer or mechanical means. Nests can only be removed in consultation with CDFG and prior to eggs being laid in the nests. Nest exclusion should be conducted throughout the nesting season consisting of either removing partially built nests weekly through the nesting season or installing exclusionary netting for as long as necessary to prevent swallows from attempting to rebuild the nests.

The proposed mitigation would reduce any temporary effects during construction on nesting migratory birds to less than significant.

Sanford's Arrowhead. As stated in the 1998 EIR/EIS, pre-construction surveys would be conducted in Unionhouse Creek prior to construction. If Sanford's arrowhead is not found, then no further mitigation would be necessary. If Sanford's arrowhead is found in the study area, appropriate mitigation would be worked out with CDFG to avoid impacts to this species. Mitigation could include transplanting any Sanford's arrowhead plants found in the study area to suitable habitats up or downstream.

### **3.4 Air Quality**

This section describes the existing air quality conditions in and near the project area. This includes the regional setting, regulatory setting, existing air quality, and sensitive receptors.

#### **3.4.1 Existing Conditions**

##### **Regional Setting**

General Climate and Meteorology. Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions (wind speed, wind direction, and air temperature) in combination with local surface topography (geographic features such as mountains and valleys) determine how air pollutant emissions affect local air quality.

The project area lies within the Sacramento Valley Air Basin (SVAB). The climate of the SVAB is Mediterranean in character, with mild, rainy winter weather from November through March and warm to hot dry weather from May through September. Sacramento Valley temperatures range from 20 to 115 degrees Fahrenheit, and the average annual rainfall is 20 inches. The topographic features giving shape to the SVAB are the Coast Range to the west, the

Sierra Nevada to the east, and the Cascade Range to the north. These mountain ranges channel winds through the SVAB, but also inhibit the dispersion of pollutant emissions.

Sacramento Valley is subject to eight unique wind patterns. The predominant annual and summer wind pattern is the full sea breeze, commonly referred to as Delta breezes (CARB, 1984). These cool winds originate from the Pacific Ocean and flow through a sea-level gap in the Coast Range called the Carquinez Straits. In the winter (December to February), northerly winds predominate. Wind directions in the Sacramento Valley are influenced by the predominant wind flow pattern associated with each season. During about half the days from July through September, the Schultz Eddy prevents the Delta breezes from transporting pollutants north and out of the Sacramento Valley by causing the wind pattern to circle back south and keep air pollutants in the Sacramento Valley.

The vertical and horizontal movement of air is an important atmospheric component involved in the dispersion and subsequent dilution of air pollutants. Without movement, air pollutants can collect and concentrate in a single area, increasing the associated health hazards. For instance, in the winter, the SVAB typically experiences calm atmospheric conditions that result in stagnant basin air and increased air pollution. As a result, persistent inversions occur frequently in the SVAB, especially during autumn and early winter, and restrict the vertical dispersion of pollutants released near ground level.

### **Regulatory Setting**

Air quality management exists at Federal, State, and local levels of government. Air quality planning programs have generally been developed in response to requirements established by the Federal Clean Air Act (CAA) and subsequent amendments to the act; however, the enactment of the California Clean Air Act (CCAA) of 1988 resulted in additional changes in the structure and administration of air quality management programs in California.

### **Federal Air Quality Management**

Air quality in the United States is governed by the CAA, which resulted in the adoption of federal air pollutant standards, known as National Ambient Air Quality Standards (NAAQS), for pollutants including carbon monoxide (CO), ozone (O<sub>3</sub>), sulfur dioxides (SO<sub>2</sub>), nitrogen dioxides (NO<sub>2</sub>), lead (Pb), particulate matter less than ten microns in diameter (PM<sub>10</sub>), and fine particulate matter (PM<sub>2.5</sub>). Federal NAAQS are shown in Table 3.4.1.

In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the CCAA. The California air pollutant standards are known as the California Ambient Air Quality Standards (CAAQS) and are generally more stringent than the NAAQS. CAAQS are shown in Table 3.4.1. Existing compliance (i.e., area “attainment”) with the NAAQS and CAAQS for criteria pollutants is discussed below, along with existing pollutant concentrations.

**Table 3.5 - Federal and State Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone	1 Hour	0.09 parts per million (ppm) (180 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ))	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 $\mu\text{g}/\text{m}^3$ )		0.08 ppm (157 $\mu\text{g}/\text{m}^3$ )		
Respirable Particulate Matter (PM10)	24 Hour	50 $\mu\text{g}/\text{m}^3$	Gravimetric or Beta Attenuation	150 $\mu\text{g}/\text{m}^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Average	20 $\mu\text{g}/\text{m}^3$		-		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 $\mu\text{g}/\text{m}^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Average	12 $\mu\text{g}/\text{m}^3$	Gravimetric or Beta Attenuation	15 $\mu\text{g}/\text{m}^3$		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 $\mu\text{g}/\text{m}^3$ )	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 $\mu\text{g}/\text{m}^3$ )	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 $\mu\text{g}/\text{m}^3$ )		35 ppm (40 $\mu\text{g}/\text{m}^3$ )		
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.030 ppm (56 $\mu\text{g}/\text{m}^3$ )	Gas Phase Chemiluminescence	0.053 ppm (100 $\mu\text{g}/\text{m}^3$ )	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (338 $\mu\text{g}/\text{m}^3$ )		-		
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	-	Ultraviolet Fluorescence	0.030 ppm (80 $\mu\text{g}/\text{m}^3$ )	-	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 $\mu\text{g}/\text{m}^3$ )		0.14 ppm (365 $\mu\text{g}/\text{m}^3$ )	-	
	3 Hour	-		-	0.5 ppm (1300 $\mu\text{g}/\text{m}^3$ )	-
	1 Hour	0.25 ppm (655 $\mu\text{g}/\text{m}^3$ )		-	-	-
Lead	30 Day Average	1.5 $\mu\text{g}/\text{m}^3$	Atomic Absorption	-	-	-
	Calendar Quarter	-		1.5 $\mu\text{g}/\text{m}^3$	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 $\mu\text{g}/\text{m}^3$	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu\text{g}/\text{m}^3$ )	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 $\mu\text{g}/\text{m}^3$ )	Gas Chromatography			

Source: CARB 2008

At the federal level, the CAA is administered by the United States Environmental Protection Agency (USEPA). In California, the CCAA is administered by the CARB at the state level and by the Air Quality Management Districts at the regional and local levels. The project alternatives are located in the SVAB. The Sacramento Metropolitan Air Quality Management District (SMAQMD) is the agency principally responsible for air pollution control in the SVAB.

**Federal Attainment Status.** Pursuant to the 1990 Federal CAA amendments, the USEPA classifies air basins (or portions) as “attainment” or “non-attainment” for each criteria air pollutant based on whether or not the national standards had been achieved. The project area lies within Sacramento County, which forms part of a multicounty region referred to as the Sacramento Federal Ozone Non-Attainment Area (SFNA).

The SFNA includes all of Sacramento and Yolo Counties, the Sacramento Valley portion of Solano County, parts of El Dorado and Placer Counties, and the southern portion of Sutter County. The SFNA has been designated as “serious” non-attainment for the national 1-hour and 8-hour average ozone standard.

Sacramento County is also designated as non-attainment for the national PM10 standard. Additionally, in June 2001, the USEPA proposed classifying Sacramento County as in attainment of the new Federal PM2.5 standard. Sacramento County is “attainment” or “unclassified” with respect to the other ambient air quality standards. A designation of “unclassified” indicates that there is insufficient data for determining attainment or non-attainment (CARB, 2005).

**Federal Conformity Requirements.** Federal projects are subject to either the Transportation Conformity Rule (40 CFR 51, Subpart T), which applies to Federal highway and transit projects, or the General Conformity Rule (40 CFR 51, Subpart W), which applies to all other Federal projects. Because the project is not a Federal highway or transit project, it is subject to the General Conformity Rule.

The purpose of the General Conformity Rule is to ensure that Federal projects conform to applicable state implementation plans (SIPs) so that they do not interfere with strategies used to attain the national ambient air quality standards. The rule applies to Federal projects in non-attainment areas for any of six criteria pollutants for which the USEPA has established these national standards and in areas designated as “maintenance” areas. The rule covers direct and indirect emissions of criteria pollutants or their precursors that result from a Federal project, are reasonably foreseeable, and can be practicably controlled by the Federal agency through its continuing program responsibility. The rule applies to all Federal projects, including projects, approvals, and funding, except:

- Projects specifically included in a transportation plan or program that is found to conform under the Federal transportation conformity rule.
- Projects with associated emissions below specified “de minimis” threshold levels (levels beyond which an air quality effect is considered significant).
- Certain other projects which are exempt or presumed to conform.

Sources that are exempt include those that require a permit under the New Source Review or Prevention of Significant Deterioration program. Projects presumed to conform are those that are presumed to result in insignificant quantities of emissions, including routine maintenance and repair, routine operations, and prescribed burning.

The project area is in serious non-attainment of Federal ozone, non-attainment of Federal PM10, and unclassified or attainment for all other criteria pollutants. If the applicable Federal project would result in total direct and indirect emissions in excess of the de minimis emission rates, it must be demonstrated through conformity determination procedures that the emissions conform to the applicable SIP for each affected pollutant.

A Federal project that does not exceed the de minimis threshold rates may still be subject to a general conformity determination if the sum of direct and indirect emissions would exceed 10 percent of the emissions of the non-attainment or maintenance area. If emissions would exceed 10 percent, the Federal project is considered “regionally significant,” and thus general conformity rules apply. This allows regulatory agencies to address those Federal projects that would not exceed the de minimis, levels but would have the potential to adversely affect the air quality of a region. If the emissions would not exceed the de minimis levels and are not regionally significant, then the project is assumed to conform, and no further analysis or determination is required.

### **State Air Quality Management**

The CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional air pollution control districts and air quality management districts. CARB regulates local air quality indirectly by establishing State ambient air quality standards and vehicle emissions and fuel standards, and by conducting research, planning, and coordinating activities.

The CAA requires each state to prepare a SIP, a planning document containing emission inventories, emission standards for motor vehicles and consumer products, and attainment plans adopted by local districts and approved by CARB for inclusion in the SIP. The USEPA must review each SIP to determine its compliance with the Federal CAA and air quality standards. Amendments to the CAA further required states containing areas that are in non-attainment for national ambient air quality standards to amend their SIPs to add additional control measures. Although the state prepares the majority of the SIP, local districts are responsible for adopting air quality attainment plans that are included in the SIP. Each attainment plan must demonstrate its compliance with the CAA and air quality standards.

Pursuant to Section 39606(b) of the California Health and Safety Code, California has adopted ambient standards that are more stringent than the national standards for some criteria air pollutants (PM10 daily and annual average standards). In July 2003, the CARB’s new annual standards for PM10 and PM2.5 took effect. The annual PM10 standard was revised from 30 to 20 µg/m<sup>3</sup>, and the annual PM2.5 standard was revised from 15 to 12 µg/m<sup>3</sup>. The State standards are also shown in Table 2.

California law defines toxic air contaminants (TACs) as air pollutants having carcinogenic effects. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated as TACs under California law; they include the 189 Federal Hazardous Air Pollutants (HAPs) adopted in accordance with AB 2728. The Air Toxics “Hot Spots” Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; AB 2588 does not regulate air toxics emissions.

**State Attainment Status.** Under the CCAA, which has been patterned after the Federal CAA, areas are designated as attainment or non-attainment with respect to the State standards. Sacramento County is designated as non-attainment for State ozone, PM10, and PM2.5 standards (CARB, 2008). The County is designated as attainment or unclassified for all other criteria pollutants.

### **Local Air Quality Management**

The regional and county air districts are primarily responsible for developing local air quality plans and regulating stationary emission sources and facilities. The project area lies within the jurisdiction of the SMAQMD, the agency empowered to regulate air pollutant emissions from stationary sources in Sacramento County. As noted earlier, the Federal CAA and the CCAA require plans to be developed for areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM10 standard). Plans are also required under Federal law for areas designated as “maintenance” for national standards. Such plans are to include strategies for attaining these standards.

The first air quality plan for the Sacramento Air Quality Maintenance Area was prepared in 1979 to meet Federal CAA requirements and to address the non-attainment designation for the national ozone and carbon monoxide standards. This 1979 plan was updated in 1982. Under the 1990 amendments to the Federal CAA, revised plans were required for those areas, such as the Sacramento metropolitan area, which had not attained the standards.

With respect to the national ozone standard, revised documents were published in 1993 and 1994. The 1994 Sacramento Regional Clean Air Plan is the current Federal air quality ozone plan for the Sacramento metropolitan area. It predicts attainment of the national 1-hour ozone standard (SMAQMD et al., 1994). To attain the standard, the 1994 ozone plan relies heavily on local air districts’ stationary-source control programs and on statewide mobile-source control programs. With respect to the national carbon monoxide standard, the revised plan includes a “maintenance” plan that demonstrates how Sacramento County will continue to maintain carbon monoxide concentrations below the standard.

Pursuant to State air quality planning requirements, the 1991 Sacramento Air Quality Attainment Plan, which is updated triennially, was developed to reduce population exposure to unhealthy levels of ozone through tighter industry controls, cleaner cars and trucks, cleaner fuels, and increased commute alternatives. The Sacramento Regional Clean Air Plan (SMAQMD et al., 1994) discussed in relation to Federal air quality requirements also served as the first triennial update under State air quality requirements. The most recent update is the 2003 Triennial Report,

adopted April 28, 2005, which identifies “all feasible measures” that the SMAQMD will analyze or adopt over the next three years (SMAQMD, 2005).

These attainment plans depend heavily on SMAQMD’s permit authority, which is exercised through SMAQMD’s Rules and Regulations. With respect to the construction phase of the project, applicable SMAQMD regulations would relate to construction equipment, particulate matter generation, architectural coatings, and paving materials. Equipment used during project construction would be subject to the requirements of SMAQMD Regulation 2 (Permits), Rule 201 (General Permit Requirements); and Regulation 4 (Prohibitory Rules), Rule 401 (Ringelmann Chart/Opacity), Rule 402 (Nuisance), Rule 403 (Fugitive Dust), Rule 404 (Particulate Matter), Rule 405 (Dust and Condensed Fumes), Rule 420 (Sulfur Content of Fuels), Rule 442 (Architectural Coatings), and Rule 453 (Cutback and Emulsified Asphalt Paving Materials).

**County of Sacramento General Plan.** The Air Quality Element of the County of Sacramento General Plan (County of Sacramento, 2003) contains the following air quality goal, objectives, and policies that would apply to the project.

Goal. Air quality which protects and promotes the public health, safety, welfare, and environmental quality of the community.

Objectives. A safe and healthful environment for pollution sensitive residential land uses and sensitive receptors.

- A reduction in motor vehicle emissions through a decrease in the average daily trips and vehicle miles traveled.
- Compliance with Federal and State air quality standards.
- A reduction in releases of ozone depleting compounds in order to ensure the protection of the stratospheric ozone layer.

Policies.

*Policy AQ-17:* Require that development projects be located and designed in a manner which will conserve air quality and minimize direct and indirect emission of air contaminants.

*Policy AQ-19:* Identify the air quality effects of development proposals to avoid significant adverse effects and require appropriate mitigation measures or offset fees.

*Policy AQ-20:* Submit development proposals to AQMD for review and comment in compliance with California Environmental Quality Act prior to consideration by the appropriate decision-making body.

*Policy AQ-22:* Provide for buffers between sensitive land uses and sources of air pollution or odor.

*Policy AQ-37: Maximize air quality benefits through selective use of vegetation in landscaping and through revegetation of appropriate areas.*

### **Existing Air Quality**

Air quality in the Sacramento metropolitan area primarily reflects emissions generated within the metropolitan area. However, it is also affected by wind-driven pollutant transport from the San Francisco Bay Area and the San Joaquin Valley (CARB, 1996). Conversely, emissions generated within the Sacramento area occasionally contribute to air quality problems in the Mountain Counties Air Basin, upper Sacramento Valley, San Joaquin Valley, and the San Francisco Bay Area.

### **Criteria Air Pollutants**

**Ozone.** Ozone is a reactive pollutant. It is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>). ROG and NO<sub>x</sub> are precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO<sub>x</sub> under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials.

Once formed, ozone remains in the atmosphere for one or two days. Ozone is then eliminated through chemical reaction with plants (reacts with chemicals on the leaves of plants), rainout (attaches to water droplets as they fall to earth), and washout (absorbed by water molecules in clouds and later falls to earth with rain). The SVAB is designated as a non-attainment area for ozone, based on both national and State standards.

**Carbon Monoxide.** Carbon monoxide is a nonreactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High carbon monoxide concentrations 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 carbon monoxide emission rates at low air temperatures. When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in less oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

**Particulate Matter.** PM10 and PM2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and that can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, grading and construction, and motor vehicle use. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others such as vehicular traffic have a more regional effect. Very small particles of certain substances (sulfates and nitrates) can cause lung damage directly or can contain adsorbed gases (chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

PM10 concentrations in Sacramento County are a result of a mix of rural and urban sources including agricultural activities, industrial emissions, dust suspended by vehicular traffic, and secondary aerosols formed by reactions in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter when more fireplaces are used and when meteorological conditions prevent the dispersion of directly emitted contaminants.

**Toxic Air Contaminants.** Non-criteria air pollutants or TACs are airborne substances capable of causing short-term (acute) or long-term, chronic, or carcinogenic (cancer-causing) illnesses. TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, diesel engines, dry cleaners, industrial operations, and painting operations. TACs are regulated separately from the criteria air pollutants at both the Federal and State levels.

### **Sensitive Receptors**

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include preexisting health problems, proximity to the emission source, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public.

Residential areas are also sensitive to poor air quality because people usually stay home for extended periods of time. The nearest residences are located on either side of the project area, the nearest having approximately 50 to 100 feet between their backyard and excavation areas. Residential uses also occur along the haul routes. Construction traffic to and from the project site would use SR 99 to Cosumnes River Boulevard, and Franklin Boulevard.

### **3.4.2 Environmental Effects**

This section evaluates the effects of the proposed alternatives on the air quality in the project area. This is a quantitative evaluation of the types and levels of emissions associated with the construction activities.

**Basis of Significance.** Adverse effects on air quality were considered significant if an alternative would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

The following analysis discusses the first four criteria; the fifth is not discussed because the project would not involve development of the types of land uses typically associated with odor issues.

**No Action Alternative.** The no action alternative would have no effects on air quality in the Sacramento area or project area. The existing sources of air pollution would be expected to remain the same. The Sacramento area would continue to be designated by the USEPA as being in non-attainment for ozone and PM10, and designated by the State as being in non-attainment for ozone, PM10, and PM2.5.

**Construct Unionhouse Creek Channel Upgrades.** Air quality effects fall into two categories: short-term construction-related effects and long-term operations-related effects. Short-term construction activities would primarily result in the generation of ROG, NOx, and PM10. The project would not include any long-term operational emission sources other than the nominal vehicle emissions associated with routine inspection and maintenance of the proposed project.

Short-term construction emissions were calculated by obtaining an inventory of required construction equipment and the hours of operation and horsepower of each piece of equipment for each construction phase. These data were then incorporated into the SMAQMD Road Construction Emissions Model. Additional information on the air emission calculations is included in Appendix F.

SMAQMD's standard emission thresholds and the USEPA's de minimis conformity thresholds were then used to determine the significance of the calculated air quality emissions. The amount of each pollutant generated during construction of each proposed alternative was compared to these thresholds. The results of this comparison are described below, as well as other criteria used to determine the overall significance of the proposed project on air quality.

According to 40 CFR 93.153, conformity determinations are required only of Federal actions that occur in nonattainment areas and result in generation of emissions that exceed established de minimis levels, shown below in Table 3.4.2.

**Table 3.4.2: Federal De Minimis Levels**

<b>Pollutant</b>	<b>Area Type</b>	<b>Tons/Year</b>
Ozone (VOC or NOx)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Carbon monoxide, SO2 and NO2	All nonattainment & maintenance	100
PM-10	Serious nonattainment	70
	Moderate nonattainment and maintenance	100

Source: EPA 2008

SMAQMD has established daily construction and operations emissions thresholds for ROG and NOx for development projects within its jurisdiction. Because SMAQMD does not have construction thresholds for CO, sulphur oxides (SOx), or PM10, the analysis conducted for the project alternatives used the federal emissions thresholds for these criteria pollutants. Table 3.4.3 summarizes the SMAQMD emissions thresholds applicable to this project.

**Table 3.4.3 Criteria Air Pollutant Emission Thresholds**

<b>Pollutant</b>	<b>SMAQMD Thresholds (pounds/day)</b>
NOx	85 (construction)
	65 (operation)
ROG	65 (operation)

Source: SMAQMD 2008

Construction of the proposed Unionhouse Creek Channel Upgrades is not expected to have any long-term effects on air quality since the operational activities (including inspection and maintenance) are expected to be similar to existing conditions. However, construction would result in direct, short-term effects on air quality. The two types of short-term emissions would be combustion emissions and dust emissions. The nearest sensitive receptors would be adjacent residences described above.

Combustion emissions would result from the use of construction equipment, truck haul trips, and worker vehicle trips to and from the construction site. Exhaust emissions from these sources would include ROG, CO, NOx, and PM10. Exhaust emissions would vary depending on the type of equipment, the duration of its use, and the number of construction worker and haul trips to and from the construction sites. Combustion emissions from heavy equipment and construction worker commute trips would vary from day to day, and would contribute incrementally to regional ozone concentrations over the construction period.

Table 3.4.4 shows that emissions of ROG, NOx, CO, and PM10 resulting from construction of the Unionhouse Creek Channel Upgrades would each be less than the de minimis thresholds established by the USEPA for conformity analyses. Consequently, the proposed action does not require an in-depth conformity analysis to evaluate ambient air quality

concentrations and instead is presumed to conform to the region’s ozone State implementation plan. Thus, the proposed action is exempt from the conformity rule. Additionally, the short-term construction-related emissions of ROG, NO<sub>x</sub>, CO, and PM<sub>10</sub> would not exceed the significance thresholds established by the SMAQMD and thus would be less than significant.

**Table 3.4.4 Estimated Air Emissions for Construction of the Unionhouse Creek Channel Upgrades**

	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>PM<sub>10</sub></b>
Site Preparation & Construction Total emissions (lbs/day)	9	70	60	11
SMAQMD thresholds (lbs/day)	65	85	N/A	N/A
Federal de minimis standards (tons/year)	50	50	100	100
Note: Estimates rounded. See Appendix F				

### 3.4.3 Mitigation

According to SMAQMD, construction projects with a maximum actively disturbed area of less than five acres would not require mitigation (Appendix B of SMAQMD’s Guide to Air Quality Assessment for Sacramento County). The PM<sub>10</sub> effects from construction activities would be considered less than significant if the maximum actively disturbed area was no more than five acres subject to heavy construction operations on any given day during grading and/or construction (Appendix B of SMAQMD’s Guide to Air Quality Assessment for Sacramento County). The maximum actively disturbed area for this project is expected to be approximately 9.5 acres; therefore, mitigation measures are required. Implementation of the BMPs listed below would reduce air emissions and ensure that the project emissions would be reduced to less-than-significant levels.

Equipment operation, activities, or processes performed by the contractor would be in accordance with all Federal and State air emission and performance laws and standards.

Dust particles, aerosols, and gaseous by-products from construction activities, and processing and preparation of materials would be controlled at all times, including weekends, holidays, and hours when work is not in progress. The contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control would be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The contractor would comply with all State and local visibility regulations.

All on-street trucks hauling soil, sand, and other loose materials would be covered or would maintain at least two feet of freeboard. Exposed surfaces, graded areas, and storage piles would be watered periodically to reduce generation of dust.

The Corps would also prepare a dust and particulate suppression plan and submit it to the SMAQMD for review before initiating construction activities. The plan would include as many of the following mitigation measures, as applicable, depending on the maximum actively

disturbed area during construction (Appendix B of SMAQMD's Guide to Air Quality Assessment for Sacramento County).

- Water exposed soil at least three times daily (55 percent mitigation factor) and additionally as required to prevent fugitive dust.
- Maintain at least two feet of freeboard for on-street trucks hauling soil, sand, or other loose materials or cover loads (1 percent mitigation factor).
- Water soil piles three times daily (55 percent mitigation factor) and additionally, as required, to prevent fugitive dust.
- Keep soil moist at all times (75 percent mitigation factor) and additionally as required to prevent fugitive dust.
- Use emulsified diesel or diesel catalysts on applicable heavy duty diesel construction equipment.
- Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, and/or other options as they become available.

### **3.5 Water Resources and Quality**

This section evaluates the effects of the proposed alternatives on the water resources and quality in the project area.

#### **3.5.1 Existing Conditions**

**Regulatory Setting.** Federal and State law mandates a series of programs for the management of surface water quality. The Clean Water Act (CWA) is the Federal law that establishes the baseline that all state and local water quality laws must meet. The CWA also gives states the authority to adopt more stringent water quality programs to manage waters within the state. The State Porter-Cologne Water Quality Control Act, which created the State Water Resources Control Board (SWRCB), regulates the California waterways and establishes pollution prevention plans and penalties.

The SWRCB is divided into nine Regional Water Quality Control Boards (RWQCB). Each RWQCB is responsible for enforcing the State water quality laws and objectives, establishing beneficial uses for each State waterway, and developing and updating basin plans that protect water quality based on beneficial use. The project area is within the Central Valley RWQCB (CVRWQCB), which authorizes discharges into State waterways under the National Pollutant Discharge Elimination System (NPDES) permitting process. NPDES permits apply to stormwater discharges or potential discharge in the project area. Construction activities that disturb more than one acre of land would require a NPDES permit for potential stormwater discharges and construction dewatering.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into wetlands and waters of the U.S. The Corps and the USEPA both have responsibilities in administering this program and typically issue permits for these regulated activities. Unionhouse

Creek falls under the jurisdiction of the Clean Water Act. Although the Corps does not issue itself permits for its own Civil Works projects, Corps regulations require the Corps to apply the guidelines and substantive requirements of Section 404 to its activities. A 404(b)(1) analysis for the proposed project is included in Appendix G.

Section 401 of the Clean Water Act, which is regulated by the RWQCB, controls the discharge of dredged or fill material into waters of the U.S. and wetlands. The Section 401 program is intended to complement Section 404 goals and to encourage basin-level analysis and protection of wetlands and riparian areas.

**Surface Water.** Unionhouse Creek experiences low summer flows from urban wastewater and agricultural runoff. The stream reach in the project area was straightened, channelized, and is maintained by the City of Sacramento on an annual basis. Maintenance consists of debris and vegetation removal. The stream reach in the project area has a nearly flat gradient. There is limited published surface water quality data for the upper and lower basins.

The Morrison Creek streams group in south Sacramento County drains a large urban and agricultural watershed with many potential commercial and industrial sources of pollutants. The water quality of the streams is heavily influenced by land uses and their respective stormwater runoff, which dilutes and transports pollutants and sediments. Morrison and Elder Creeks were listed on the 2002 Clean Water Act Section 303(d) list of water quality limited segments. Currently, according to the 2006 CWA Section 303(d) list of water quality limited segments, Morrison and Elder Creek are not listed as impaired.

Because the Morrison Creek streams group is a primary water source for the Beach and Stone Lakes area, the relative water quality of the creeks can directly affect water resources in Beach and Stone Lakes. Operations of the City's pump number 90 help to reduce water quality effects on the lakes. Summer flows and low stormwater flows are diverted from Morrison Creek into the Sacramento River by the pump structure. However, the pump's limited capacity prevents diversion of all runoff from moderate to high stormwater events, resulting in some polluted runoff flowing into the Beach and Stone lakes area.

**Groundwater.** Groundwater is present in two saturated water-bearing zones. The first zone is referred to as the "shallow saturated zone" and is located about 20 to 50 feet below the ground surface. The second zone is referred to as the "first aquifer" and is located about 50 to 80 feet below the ground surface. Groundwater elevations in wells at the Sacramento Regional Wastewater Treatment Plant show seasonal changes of about five feet. The groundwater system in the project area has very little exchange with the Sacramento River and is considered hydrologically independent. The aquifers are predominantly recharged by infiltration from streams in the watershed. Monitoring wells in and around the treatment plant provide the existing data on groundwater in the project area. Since the same groundwater basin underlies the entire study area, it is assumed that groundwater in the project area has similar characteristics to the groundwater below the treatment plant.

Groundwater monitoring at the Sacramento Regional Wastewater Treatment Plant has been conducted since 1982 although some 1990 monitoring was conducted at a limited number

of wells. The purpose of the monitoring is to identify potential releases from the treatment plant's solids disposal facility and any associated effects on underlying groundwater. More extensive monitoring began in 1990 to comply with waste discharge requirements issued by the CVRWQCB in accordance with Chapter 15 of the California Code of Regulations. Chapter 15 pertains to water quality aspects of waste discharge to land. Numerous groundwater studies were conducted at the treatment plant to comply with Chapter 15. As a part of these studies, up gradient groundwater conditions were established for the two water-bearing zones.

Between 1990 and 1994, quarterly monitoring was performed for specific conductance, pH, nitrate as elemental nitrogen, chloride, total dissolved solids, arsenic, and chromium. Results from monitoring indicate that (1) the concentrations of these constituents varied from one monitoring well to another, and (2) the concentrations in the upper and lower saturated zones varied dramatically (SRCSD, 1994). Cadmium, copper, nickel, and zinc were analyzed annually, and pesticides and biphenyls were tested every other year. Testing results for these constituents were below detection limits.

### **3.5.2 Environmental Effects**

**Basis of Significance.** Adverse effects on water quality were considered significant if an alternative would result in any of the following:

- Substantially alter the existing drainage pattern of the area, including the alteration of the course of a stream, in a manner which would result in substantial erosion or sedimentation on- or offsite.
- Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or lowering of the local groundwater table level.
- Substantially degrade surface water or groundwater quality such that it would violate criteria or objectives identified in the CVRWQCB Basin Plan or otherwise substantially degrade water quality to the detriment of beneficial uses.

**No Action Alternative.** Under the no action alternative, no construction would take place. As a result, the existing water quality in the study area would continue to be affected by local conditions such as stormwater and urban runoff. In addition, the project area would not be able to safely contain a flood event with a 1% chance of occurrence in any given year or ensure that the area meets the minimum FEMA level of flood protection.

**Construct Unionhouse Creek Channel Upgrades.** The proposed channel upgrades would be constructed between May and October when flows in Unionhouse Creek are low. Under this alternative, water quality in the project area could be degraded both during and immediately after construction. In-channel staging and construction activities would disturb soils, which could be carried downstream by flows in the creek. In addition, accidental fuel spills could contaminate Unionhouse Creek. Channel excavation, bridge retrofitting, and construction of the drop structure would require the diversion and dewatering of the Unionhouse Creek channel during construction activities. Creek flows would be pumped around the construction area and reintroduced downstream of Franklin Boulevard. Diversion of water could temporarily

increase turbidity below the affected channel section. Stormwater flows in the excavated channel section could also increase turbidity downstream of the construction area.

Contamination of surface water and/or channel soils could result from construction activities within Unionhouse Creek. Spills of oil, grease, fuels, hydraulic fluids, or related pollutants could occur during vehicle refueling, parking, and maintenance. Improper handling, storage, or disposal of fuels and materials or improper cleaning of machinery close to or within Unionhouse Creek could cause surface water quality degradation if these fuels are washed into the creek. Because the construction work would take place during low-flow summer months with very little precipitation, it is less likely that construction activities in Unionhouse Creek would affect downstream waterways.

As discussed in Section 3.1.2, although there would be a loss of permeable surface for infiltration due to the reshaping of the existing channel, there would not be an increase in non-point source runoff as a result of the project. Flap gates would be periodically spaced over the length of the rectangular channel to convey runoff and drainage from the vegetated swale and the maintenance road into the channel.

Operations of the City's pump number 90, downstream of the project area, help to reduce water quality effects on the Beach and Stone Lakes. Summer flows and low stormwater flows are diverted from Morrison Creek into the Sacramento River by the pump. Summer flows from Morrison Creek would be low in volume and would be diluted by the relatively large volume of flow in the Sacramento River. As a result of dilution, effects on water quality in the Sacramento River from contaminants in Morrison Creek and thereby in Unionhouse Creek would likely be minimal.

The proposed project would be regulated under the CWA Section 404 and 401 programs. To comply with Section 402 of the CWA, a NPDES permit would be obtained from the CVRWQCB. Because the proposed construction activities would disturb more than one acre, the applicable permit is the General Permit for Discharges of Storm Water Associated with Construction Activity, known as a General Construction Permit. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must list BMPs that the contractor would use to control storm water runoff and reduce erosion and sedimentation. Therefore, by complying and obtaining the above mentioned regulations and permits along with implementing the mitigation and BMPs proposed below, the potential to affect surface water quality would be minimized.

Operation of the proposed project is anticipated to relieve local flooding. According to the Draft Hydraulic Design Documentation Report for the proposed project, (HDR, 2008) flow velocities between the unlined trapezoidal channel that was proposed in the 2004 Technical Appendices to the Limited Reevaluation Report (LRR) and the proposed concrete rectangular would be within the allowable limits and would average 5.4 feet/second.

Potential hydraulic impacts of the proposed channel modifications on the existing channel upstream of the project reach were assessed at three locations along Unionhouse Creek: 1) upstream face of Center Parkway; 2) downstream of the confluence with Strawberry Creek;

and, 3) upstream face of Highway 99. A stage-discharge relationship, or rating curve, was utilized to assess the hydraulic impacts at each of above mentioned locations along Unionhouse Creek. The rating curves reflect the existing channel geometry and the refined design channel geometry. Review of the rating curves indicates that the peak stages are reduced by the proposed channel geometry. Upon reviewing the pre-project and post-project floodplains, the reduced stages indicate that there would not be a negative upstream backwater effect due to the proposed channel upgrades.

The hydrologic review for the project included examining existing conditions and future conditions. Future conditions hydrology included evaluating all proposed future development and improvements for the project. The proposed project upgrades are designed to raise the level of flood protection in the project area to a point that it can safely contain a flood event with a 1% chance of occurrence in any given year considering increases in the flows due to future development and the improvements from the project. Therefore, as a result of the hydrologic review for the proposed project there would be no negative downstream hydraulic effects due to the proposed channel upgrades.

There is a low potential for ground-water quality and levels to be affected by the proposed action. However, contaminants such as petroleum products could be spilled and seep into local ground-water sources. Implementation of the mitigation measures presented below including the BMPs proposed would minimize the potential for a spill to affect ground-water quality in the project area. The proposed construction activities would not substantially change the existing channel conditions in terms of soil permeability. As a result, there would be little or no change in ground-water recharge or depletion of ground water sources used for other beneficial uses.

### **3.5.3 Mitigation**

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. The contractor would be required to obtain a NPDES permit from the CVRWQCB, since the project would disturb one or more acres of land and involve possible storm water discharges to surface waters. In addition, the contractor would prepare a SWPPP identifying BMPs to be used to avoid or minimize any adverse effects of construction on surface waters. Implementation of the following BMPs would act as mitigation as they would ensure that the effects on water quality would remain at less-than-significant levels.

- Prepare a spill control plan and a SWPPP prior to initiation of construction activities. The SWPPP would be developed in accordance with guidance from the CVRWQCB. These plans would also be reviewed and approved by the Corps.
- Implement appropriate measures to prevent any debris, soil, rock, or other construction activities from getting into the water. The contractor will use appropriate measures to control dust on the project site and stockpiles.
- Properly dispose of oil or liquid wastes.
- Fuel and maintain vehicles in specified areas that are designed to capture spills.

- Inspect and maintain vehicles and equipment to prevent dripping of oil and other fluids.
- Schedule construction to avoid as much of the wet season as possible. If rains are forecast during the construction period, erosion control measures would be implemented as described in the CVRWQCB Erosion and Sediment Control Field Manual.
- Train construction personnel in stormwater pollution prevention practices.
- Revegetate and restore areas cleared by construction in a timely manner to control erosion.

In addition, the Unionhouse Creek channel section under construction would be dewatered by installing temporary cofferdams and by diverting streamflow through a culvert and around the channel section to be excavated. When construction is completed, the cofferdam would be removed, and flow would enter the new channel. The concrete lining of the channel would be allowed the appropriate time to cure before flow is returned to the creek channel.

Additional implementation of the measures in the Spill Prevention and Response Plan and the Erosion and Sediment Control Plan would prevent any significant adverse effects to water quality in the project area. The inclusion of the above mitigation measures would reduce any impacts to a less than significant level.

### **3.6 Traffic and Circulation**

This section evaluates the effects of the proposed alternatives on traffic and circulation in the project area.

#### **3.6.1 Existing Conditions**

**Regional Transportation.** This section describes the existing roadways, transit, bicycle, parking, and pedestrian systems that serve the community in and near the project area. Information was obtained from field observations, surveys, previous environmental reports, and available information from the County, Caltrans, the Sacramento Area Council of Governments (SACOG), and Regional Transit.

**Freeway/Roadway Network.** Nearby freeway interchanges on SR 99 include Mack Road and Cosumnes River Boulevard. Other roadways providing access to the project area include Center Parkway and Franklin Boulevard. These roadways are shown on Plate 3.

State Route (SR) 99 is located east of the project area and extends from the north of the City of Sacramento to south of Bakersfield near the Tehachapi Mountains. This multi-lane, interstate freeway provides regional access to the project area.

Cosumnes River Boulevard extends in an east-west direction from Franklin Boulevard to SR 99. East of SR 99 Cosumnes River Boulevard becomes Calvine Road which extends to Grant Line Road. Near the project area, the roadway has two lanes and is contiguous to open space and residential uses. The Cosumnes River Boulevard extension project has been planned and

approved and will extend Cosumnes River Boulevard through the Bufferlands to the town of Freeport and will construct an interchange at Interstate 5.

Center Parkway extends in a northwest-southeast direction from just south of Florin Road until it turns east 90 degrees and becomes Sheldon Road. Sheldon Road continues east of SR 99 and extends to Grant Line Road. Near the project area, Center Parkway is a divided four lane improved arterial and serves mainly residential and some commercial uses.

Franklin Boulevard extends in a north-south direction from Broadway near the Highway 50 and SR 99 interchange to approximately Mokelumne City where it becomes Thornton Road. Franklin Boulevard is a divided four lane improved roadway that primarily serves local residences and is contiguous to open space and commercial uses in the project area.

**Transit System.** The Sacramento RT provides transit service. RT operates a system of bus and light rail routes. Several bus routes run through the project vicinity. These routes include numbers 7, 51, 54, 56, 58, 61, 62, and 67, which travel on Franklin Boulevard, Center Parkway, and other roadways in the area. Currently, there are no light rail stations or tracks in the project vicinity. The nearest light rail station is located on Meadowview Road. RT proposes to extend the South Line light rail system along the existing UPRR tracks south to the confluence of Morrison Creek and Unionhouse Creek where the South Line would then turn east and run adjacent to the planned Cosumnes River Boulevard extension project. The RT South Line Extension Supplemental Draft EIS/Subsequent Draft EIR Draft Section 4(f) prepared in January 2007 indicates that a park and ride and station would be located within the Bufferlands property west of Franklin Boulevard. The RT South Line light rail tracks would continue east between the existing Cosumnes River Boulevard and the Unionhouse Creek project area.

**Bicycle and Pedestrian Circulation.** The project area is located adjacent to a suburban neighborhood and not far from Cosumnes River College. Most access to the area is by automobile with some transit use. Sidewalks for pedestrians are provided on some of the roadways that access the project area, including Franklin Boulevard, Center Parkway, and Cosumnes River Boulevard. In addition, residential roadways in the project vicinity provide sidewalks for pedestrians, but not on-road bicycle lanes. Many streets in the study area do not have official posted bike lanes but still provide adequate striped shoulders with prohibited parking. These shoulders allow safe bicycling.

### **3.6.2 Environmental Effects**

**Basis of Significance.** Adverse effects on traffic were considered significant if an alternative would result in any of the following:

- Substantially increase traffic in relation to existing traffic load and capacity of the roadway system.
- Substantially disrupt the flow and/or travel time of traffic.
- Expose people to significant public safety hazards resulting from construction activities on or near the public road system.
- Reduce supply of parking spaces sufficiently to increase demand above supply.

**No Action Alternative.** The no action alternative would have no effect on traffic and circulation in the project area. The existing freeway/roadway network, proposed RT rail lines, bicycle and pedestrian facilities, types of traffic, and circulation patterns would be expected to remain the same. The volume of traffic could continue to increase in the region due to continuing development.

**Construct Unionhouse Creek Channel Upgrades.** Construction of the Unionhouse Creek Channel Upgrades would have short-term effects on the traffic and circulation in the project area. Construction activities could affect the types, volumes, and movement of traffic; public safety; and parking availability in and near the project area. Worker vehicles would include private cars and pickup trucks. These types of vehicles would be consistent with existing types of traffic on regional roadways and neighborhood streets. However, while the trucks transporting equipment and materials would be consistent with the types of traffic on regional roadways, they would not be consistent with the typical types of residential traffic using nearby neighborhood streets.

The volume of traffic on regional roadways and neighborhood streets would temporarily increase during construction of the project. This increase would result from the use of these roadways by worker vehicles and haul trucks to access the project area and work sites. Based on estimated trips per day and durations, construction of the Unionhouse Creek Channel Upgrades would increase the traffic volume by five to ten roundtrip truck trips per day. This increase in Average Daily Trips (ADTs) would represent a minimal increase in vehicle traffic in the regional transportation network. In addition, this small increase would not be expected to affect the current Level of Service on SR 99, Franklin Boulevard, or Cosumnes River Boulevard. Therefore, this increase in regional traffic would not be considered significant.

Based on field visits, the existing volumes of traffic on the project area roadways are consistent with other similar arterials, with higher volumes during the a.m. and p.m. peak hours. While the ADT increase would be five to ten truck trips, the daily number of trips and durations during construction would actually vary, depending on the work being conducted. This number could range from approximately five to ten roundtrip truck trips per day for 60 days during site preparation to approximately five roundtrip truck trips per day for 120 days during construction of the channel upgrades. These increases would not be considered significant.

During construction, trucks and worker vehicles would be entering and exiting the project area via Cosumnes River Boulevard and Franklin Boulevard and to a limited extent on Center Parkway for access to Unionhouse Creek and to turn trucks around only. This could disrupt the traffic flow at these intersections and possibly pose a safety hazard to other motorists, pedestrians, and bicyclists on and along these roadways particularly when local schools are in session. Signs and flaggers would be used, as needed, to ensure public safety. The trucks and worker vehicles would be parked in designated areas in the staging areas. No construction-related vehicles would be parked along regional roadways or nearby residential areas. As a result, there would be no effects on parking supply or availability. While construction of the Unionhouse Creek Channel Upgrades would not substantially disrupt the flow and/or travel time of traffic, expose people to significant safety hazards, or reduce the supply of parking spaces,

traffic in the project area would increase during construction. In addition, above-deck bridge retrofit construction, such as parapet wall installation, may require temporary lane closures on some roadways. Any lane closures would have short-term effects on traffic flows and are assumed to last two to four weeks.

As stated in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR; the Corps, the CVFPB, and SAFCA would acquire an encroachment permit and would coordinate with the City of Sacramento and Caltrans to develop a traffic management plan that would recommend measures to minimize the temporary effect to traffic flows on city and State roadways caused by any project construction traffic, as well as any temporary lane and road closures. The traffic management plan would include specific plans for retrofitting activities at the Franklin Boulevard and Center Parkway bridges, minimizing the amount of time lanes would be closed and providing appropriate detours as needed to reduce the level of effect to traffic to less than significant. Therefore, since all traffic effects would be short-term and temporary, and a traffic management plan and mitigation measures would be implemented, it is anticipated that potential impacts to traffic and transportation would be less than significant.

### **3.6.3 Mitigation**

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. The following measures would be implemented to reduce the adverse affects on traffic and circulation:

- Construction vehicles shall not be permitted to block any roadways or private driveways.
- Access shall be provided for emergency vehicles at all times.
- Haul routes shall be selected to avoid schools, parks, and high pedestrian use areas, when possible. Crossing guards shall be provided when truck trips coincide with school hours and when haul routes cross student travel paths.
- On-street parking shall be limited for construction workers, and adequate off-street parking shall be provided for construction workers.
- All speed limits, traffic laws, and transportation regulations shall be obeyed during construction.
- Signs and flaggers shall be used as needed to alert motorists, bicyclists, and pedestrians to avoid conflicts with construction vehicles or equipment.
- Different streets shall be used for truck entering and exiting.

Although, there would be an increase in traffic in the project area during construction, this increase would be short-term and would be reduced to a less-than-significant level with implementation of these measures.

## **3.7 Noise**

This section evaluates the effects of the proposed alternatives on the noise levels in the project area. The effects of vibration on buildings are also considered.

### 3.7.1 Existing Conditions

Noise can be defined as unwanted sound. Sound traveling through the air as waves emanating outward from a source exerts a sound pressure level (referred to as sound level), which is measured in decibels (dB). Pressure waves traveling through air exert a force registered by the human ear as sound. Zero dB corresponds roughly to the threshold of human hearing, and 120 to 140 dB corresponds to the threshold of pain. Continuous human exposure to sound above roughly 90 dB can cause permanent hearing loss.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted of each measured Hz and corresponding sound power level. The audible sound spectrum consists of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force of all wave energy in the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. Consequently, when assessing potential effects of noise, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz to imitate the human ear's decreased sensitivity to low and extremely high frequencies. This emulation of the human ear's frequency sensitivity is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the specific sound level from a source is measured using a meter incorporating an electrical filter corresponding to the A-weighting curve. All of the noise levels reported here are A-weighted unless otherwise stated.

**Noise Exposure and Community Noise.** While a noise level is a measure of noise at a given instant in time, noise exposure is a measure of sound experienced over a period of time. Community noise varies over time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of (1) many distant, unidentifiable noise sources that constitute relatively stable background noise throughout a typical day and (2) short duration single event noise sources that are readily identifiable to the individual. Because of the noise level variability, the measurement of noise exposure over a period of time is required to accurately characterize community noise and evaluate cumulative effects on noise. This time-varying characteristic of environmental noise is described using the statistical noise descriptors summarized below:

**Leq:** The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The Leq is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (the average noise exposure level for the given time period).

**Lmax:** The instantaneous maximum noise level for a specified period of time.

**L10:** The noise level that is equaled or exceeded 10 percent of the specified time period. The L10 is often considered the maximum noise level averaged over the specified time period.

**Ldn:** See DNL, the Ldn is the same as the DNL.

**L90:** The noise level that is equaled or exceeded 90 percent of the specified time period. The L90 is often considered the background noise level averaged over the specified time period.

**DNL:** The day/night average sound level is the 24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted by adding 10 dBA to take into account the greater annoyance of nighttime noise (formerly called Ldn).

**CNEL:** Similar to the DNL, the community noise equivalent level adds a 5-dBA penalty for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

**SEL:** A receiver's cumulative noise exposure from a single noise event. Often used to calculate Leq and DNL values.

**Effects of Noise on People.** The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. For increases in A-weighted noise level, the following relationships occur (Caltrans, 1998):

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA.

- Outside of such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise.
- It is widely accepted that the average healthy ear can barely perceive noise level changes of 3 dBA.
- A change in level of 5 dBA is a readily perceptible increase in noise level.
- A 10-dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple linear fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

**Noise Attenuation.** Stationary “point” sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending on environmental conditions (atmospheric conditions and noise barriers, either vegetative or manufactured). Widely distributed noises such as a large industrial facility spread over many acres or a street with moving vehicles (a “line” source) would typically attenuate at a lower rate, approximately 3 to 4.5 dBA per doubling distance from the source (also depends on environmental conditions) (Caltrans, 1998). Noise from large construction sites (or a landfill with heavy equipment moving dirt and solid waste daily and trucks entering and exiting the main gate daily activities similar to construction sites) would have characteristics of both point and line sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

**Noise Regulation and Management.** In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, as well as commercial and industrial activities, are also major sources of noise in some areas.

Generally, the Federal Government sets noise standards for transportation noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks. For those noise sources, the State is preempted from establishing more stringent standards. The State sets noise standards for those transportation noise sources that are not preempted from regulation, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies.

**Federal Noise Regulation and Management.** Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The Federal truck pass-by noise standard is 80 dB at 49.2 feet from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

**State Noise Regulation and Management.** Title 4, California Code of Regulations, has guidelines for evaluating the compatibility of various land uses as a function of community noise

exposure. The State establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State pass-by standard is consistent with the Federal limit of 80 dB. The State pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dB at 49.2 feet from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by State and local law enforcement officials.

The State has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations). The noise insulation standards set forth an interior standard of DNL 45 dB in any habitable room. They require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to exterior noise levels greater than DNL 60 dB. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

**Local Noise Regulations and Management.** Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans. General plans recognize that different types of land uses have different sensitivities toward their noise environment. Residential areas are generally considered to be the most sensitive type of land use to noise, and industrial/commercial areas are generally considered to be the least sensitive.

Noise ordinances set forth the specific standards and procedures for addressing particular noise sources and activities. Local noise ordinances typically set forth standards related to construction activities, nuisance-type noise sources, and industrial property-line noise levels. Noise in the project area is regulated by the City of Sacramento via the General Plan (1988) and the Noise Ordinance (2007).

**City of Sacramento General Plan.** The Health and Safety Element of the City General Plan establishes specific policies for noise sources. The applicable policies include:

- |                         |   |
|-------------------------|---|
| <b>Goal A, Policy 2</b> | Require mitigation measures to reduce noise exposure to the “Normally Acceptable Levels” except where such measures are not feasible.   |
| <b>Goal C, Policy 1</b> | Review projects that may have noise generation potential to determine what impact they may have on existing uses. Additional acoustical analysis may be necessary to mitigate identified impacts. |
| <b>Goal C, Policy 2</b> | Enforce the Sacramento Noise Ordinance as the method to control noise from sources other than transportation sources.   |
| <b>Goal D, Policy 2</b> | Encourage the incorporation of the latest noise control technologies in all projects.   |

**City of Sacramento Noise Ordinance.** The City’s Noise Control Ordinance sets limits for exterior noise levels on designated agricultural and residential property. The ordinance is primarily concerned with regulating noise other than noise generated by transportation noise sources such as passing cars or aircraft flyovers. The ordinance limits the duration of sound based on many factors, including the type of source, ambient noise levels, and time of day, by using a system of noise criteria not to be exceeded based on the duration of noise over any given hour. The City’s exterior noise standards that would apply to the project are described below (City of Sacramento, 2007b).

- A. The following noise standards unless otherwise specifically indicated in this article shall apply to all agricultural and residential properties.
  - 1. From 7:00 a.m. to 10:00 p.m. the exterior noise standard shall be 55 dBA.
  - 2. From 10:00 p.m. to 7:00 a.m. the exterior noise standard shall be fifty (50) dBA.
- B. It is unlawful for any person at any location to create any noise which causes the noise levels when measured on agricultural or residential property to exceed for the duration of time set forth following, the specified exterior noise standards in any one hour by:

<u>Cumulative Duration of the Intrusive Sound</u>	<u>Allowance Decibels</u>
Cumulative period of 30 minutes per hour	0
Cumulative period of 15 minutes per hour	+5
Cumulative period of 5 minutes per hour	+10
Cumulative period of 1 minute per hour	+15
Level not to be exceeded for any time per hour	+20

The City’s noise standards also include exemptions for the following activities:

Noise sources due to the erection (including excavation), demolition, alteration or repair of any building or structure between the hours of 7:00 a.m. and 6:00 p.m., on Monday, Tuesday, Wednesday, Thursday, Friday and Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday; provided, however, that the operation of an internal combustion engine shall not be exempt pursuant to this subsection if such engine is not equipped with suitable exhaust and intake silencers which are in good working order.

**Sources and Levels of Noise.** The primary sources of noise in and near the project area are traffic on area roadways, occasional planes and helicopters, residential and recreational activities, and natural sounds such as wind and wildlife. However, the overall ambient noise level is defined mainly by traffic, especially on Franklin Boulevard and Center Parkway.

**Sensitive Land Uses and Receptors.** Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses.

Noise sensitive land uses in the project area are primarily residential uses, generally 50 to 100 feet from the project area. However, in some cases, residences are as close as 15 feet from the creek and potential project construction activities. Residential uses also occur along the haul routes. Construction traffic to and from the project site would use State Route 99, Cosumnes River Boulevard, Center Parkway, and Franklin Boulevard.

**Vibration.** Construction equipment can create seismic waves that radiate along the surface of the earth and downward into the earth. Surface waves can be felt as ground vibration. Ground vibration can result in effects ranging from annoyance to people to damage of structures. Varying geology and distance result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes decrease with increasing distance from the vibration source.

As seismic waves travel outward from a source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (ppv).

Potential annoyance and physical damage to buildings from vibration are the primary issues associated with groundborne vibration. Table 3.7.1 shows the human response to continuous groundborne vibration (Whiffen, 1971). Table 3.7.2 shows damage potential thresholds for vibration generated by construction activities (AASHTO, 1990).

**Table 3.6 Human Response to Continuous Vibration From Traffic**

<b>PPV (in/sec)</b>	<b>Human Response</b>
0.4-0.6	Unpleasant
0.2	Annoying
0.1	Begins to annoy
0.08	Readily perceptible
0.006-0.019	Threshold of perception

Source: Whiffen, 1971.

**Table 3.7 AASHTO Maximum Vibration Levels For Preventing Damage**

Type of Situation	Limiting Velocity (in/sec)
Historic sites or other critical locations	0.1
Residential buildings with plastered walls	0.2-0.3
Residential buildings in good repair with gypsum board walls	0.4-0.5
Engineered structures without plaster	1-1.5

Source: AASHTO, 1990

### **3.7.2 Environmental Effects**

**Basis of Significance.** Adverse effects on noise are considered significant if an alternative would result in any of the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Substantial short-term or periodic increase in ambient noise levels in the project vicinity above existing levels without the project.
- Substantial long-term increase in ambient noise levels in the project vicinity above levels without the project.
- Vibration exceeding 0.2 inch per second within 75 feet of existing buildings.

**No Action Alternative.** Under the no action alternative, the Corps would not construct the flood damage reduction features included in the previously authorized SSCSP. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Existing sources of noise, and sensitive land uses and receptors would be expected to remain the same.

**Construct Unionhouse Creek Channel Upgrades.** Construction activity noise levels at and near the Unionhouse Creek Channel Upgrades construction areas would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving), which can be particularly annoying. Table 3.7.3 shows typical noise levels during different construction stages. Table 3.7.4 shows typical noise levels produced by various types of construction equipment.

**Table 3.8 Typical Construction Noise Levels**

<b>Construction Phase</b>	<b>Noise Level (dBA, Leq)<sup>a</sup></b>
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

<sup>a</sup> Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Source: U.S. Environmental Protection Agency, 1971.

**Table 3.9 Typical Noise Levels From Construction Equipment**

<b>Construction Equipment</b>	<b>Noise Level (dBA, Leq at 50 feet )</b>
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Scraper	88
Jack Hammer	88
Dozer	87
Paver	89
Generator	76
Pile Driver	101
Backhoe	85

Source: Cunniff, 1977.

Based on their distance from the project site, sensitive receptors in the project area are anticipated to experience noise levels similar to those described above in Tables 3.7.3 and 3.7.4. Construction noise at these levels would be substantially greater than existing noise levels at nearby sensitive receptor locations. Construction activities associated with the project would be temporary in nature and related noise impacts would be short-term. However, since construction activities could substantially increase ambient noise levels at noise-sensitive locations, especially if they were to occur during the nighttime hours, noise from construction would be potentially significant without mitigation. Implementation of the mitigation measures presented below would reduce noise effects to less-than-significant.

### **3.7.3 Mitigation**

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR.

The following measures would be implemented to reduce the adverse effects on noise as much as possible:

- Construction activities shall be limited; and will occur between the hours of 7:00 a.m. and 6:00 p.m., on Monday through Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday in accordance with the City’s Noise Ordinance.

- Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.
- Construction equipment, haul trucks, and worker vehicles shall be turned off when not in use for more than 30 minutes.
- Residences shall be notified about the type and schedule of construction.
- A voluntary pre- and post-construction survey shall be conducted in order to assess potential architectural damage from construction vibration related to project construction at each residence within 75 feet of construction activities.

Compliance with the local noise ordinance would minimize the exposure of residents to excessive noise.

### **3.8 Aesthetics/Visual Resources**

This section evaluates the effects of the proposed alternatives on the aesthetics in the project area. This evaluation is based on the changes in character and quality of views as compared to existing conditions.

#### **3.8.1 Existing Conditions**

Aesthetic resources are those natural resources, landforms, vegetation, and structures in the environment that generate one or more sensory reactions and evaluations by viewers. In the project area, viewers include mainly residents and motorists. The regional viewshed in the area includes large areas of residential, commercial, and industrial urban development. There are no State-designated visual resources in the project area.

Local views in the project area include both developed and natural areas. On the north side of Unionhouse Creek are landscaped homes, driveways, and neighborhood streets. The 12-foot-high earthen berm is visible to those residents living directly north of the creek. The Creek banks are vegetated above the low-flow concrete lined channel. The banks of Unionhouse Creek are regularly maintained and include very little woody vegetation. The south side of Unionhouse Creek between Franklin Boulevard and Center Parkway is a vacant area that lacks landscaping. There are many City facilities located south of the creek in the project area. A transfer station is located southwest of the Franklin Boulevard Bridge. A sump facility and a pump station also occur on the south side of the creek. The sump is located between Franklin Boulevard and Center Parkway and the pump station is located east of Center Parkway.

#### **3.8.2 Environmental Effects**

**Basis of Significance.** Adverse effects on aesthetics and visual resources were considered significant if an alternative would result in any of the following:

- Have a substantial adverse effect on scenic views.

- Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings near a State Scenic Highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.

**No Action Alternative.** The no action alternative would have no effects on aesthetics or visual resources in the project area. The basic components, character, and quality of the regional and local viewsheds would be expected to remain the same although some open areas could be replaced with urban development in the region.

**Construct Unionhouse Creek Channel Upgrades.** Construction of the Unionhouse Creek Channel Upgrades would have both short-term and long-term effects on the aesthetics in the project area. During construction, the presence and use of equipment, trucks, and worker vehicles would disrupt the current viewshed in the project area. Residents north of Unionhouse Creek would be aware of the movement of vehicles in the proximity of their back property lines. However, all direct construction activities would be contained to the Unionhouse Creek Channel and banks and therefore would be shielded from residents. In addition, all equipment, trucks, and worker vehicles would be removed once construction is completed. As a result, the character of the local viewshed would change substantially during construction.

Site preparation for the Unionhouse Creek Channel Upgrades would not involve removing any trees or shrubs. As mentioned previously all construction activities would be contained to the Unionhouse Creek channel and banks, which is currently degraded and lacking in visual appeal.

Once construction is completed, all disturbed areas would be restored. Disturbed areas would be reseeded with native grasses to promote revegetation. The staging areas would also be reseeded and planted with native trees and shrubs. The grasses, as well as annuals and some small shrubs, would be expected to grow relatively quickly and restore that part of the viewshed within a year or two. As a result, the project would not be considered a significant effect on the visual character of the area.

Plate 6 shows photos of the project area. Unionhouse Creek is channelized and urban in nature. Construction of the proposed project would not significantly change the assessment of visual effects conducted in the 1998 EIS/EIR, 2004 EA, or 2004 SEIR. However, due to constrained right-of-way availability as a result of other planned projects in the vicinity additional channel upgrades are being proposed that were not initially identified in the 1998 EIS/EIR, 2004 EA, or 2004 SEIR.

The proposed action consists of upgrading the channel of Unionhouse Creek for approximately 5,800 feet). The primary purpose of this effort is to increase the creek channel's capacity to handle higher flows during flood events. Unionhouse Creek currently has a low-flow, concrete-lined trapezoidal channel that is 12 feet wide on the bottom and 68 feet wide on the top. The proposed action includes reshaping the creek bed and channel into a rectangular concrete lined channel.

The rectangular concrete channel would be approximately 40 feet wide by 17 feet deep. The concrete channel would extend above grade on both sides of the channel. On the south side, the extended concrete channel would be two to three feet above ground level and on the north side it would be two to five feet above ground level. The above ground extension of the concrete channel would have a uniform thickness of approximately one foot on either side. The extension of the concrete channel contributes to the structural integrity of the rectangular channel. A vegetated swale would be constructed within the 72 feet wide project impact area. The vegetated swale would serve both a water quality function and a drainage function for the project area. A 15-foot wide maintenance road would also be constructed within the 72 feet wide project impact area between the eastern edge of the Franklin Boulevard Bridge and the western edge of the Center Parkway Bridge.

Since construction activities would be short-term, there would be no significant effects on aesthetics or the public view as a result of construction. Residents and motorists in the area would have a limited view of the proposed maintenance road and channel upgrades due to existing barriers and fences that would minimize any adverse effects of the visual quality of the proposed project. Graffiti, however, is an ongoing problem in the project area. The proposed extension of the concrete channel above grade could provide additional areas for graffiti. Both residents and motorists in the area may have a limited view of any graffiti on the extended concrete channel walls due to existing barriers and fences that would minimize any adverse effects of the visual quality of the proposed project. In addition, since there would be minimal area for graffiti to exist and access to the area would be restricted to the public and limited to inspections and maintenance crews, any potential impacts associated with the long-term operation of the project would be considered less-than-significant on the visual character of the area.

The visual effects of the extended concrete channel walls would be further lessened with implementation of design features. Such features could include coating the extended concrete channel walls with paint that facilitates the removal of graffiti. There would also be a routine graffiti removal program, implemented, as part of operation and maintenance. As a result any impacts to aesthetics and visual resources would be less than significant.

### **3.8.3 Mitigation**

The commitments set forth in the impact discussion above provide measures to reduce or mitigate potential adverse short-term effects in the character and quality of the viewshed during construction. There would be no significant long-term effects on aesthetics or visual resources in the project area. As a result, adverse effects to aesthetics would be considered less than significant and no mitigation is required.

## **3.9 Cultural Resources**

This section addresses the sensitivity of the project area for cultural resources. A cultural resource is the term used to describe several different types of properties, including archaeological, architectural, and traditional cultural properties. Archaeological sites include both prehistoric and historic deposits. Architectural properties include buildings, bridges, and infrastructure. Traditional cultural properties (TCP) include those locations of importance to a particular ethnic group. Most

often TCP's are of importance to Native American groups because of the role the location has in traditional ceremonies or activities.

### **3.9.1 Existing Conditions**

**Regulatory Setting.** Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800) 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 National Register of Historic Places. To determine whether an undertaking could affect National Register-eligible properties, cultural resources (including archeological, historical, and traditional cultural properties) must be inventoried and evaluated for listing in the National Register prior to implementation of the undertaking.

CEQA also requires that for public or private projects financed or approved by public agencies, the effects of the projects on historical resources and unique archeological resources must be assessed. Historical resources are defined as buildings, sites, structures, objects, or districts that have been determined to be eligible for listing in the California Register of Historical Resources. Properties listed in the National Register are automatically eligible for listing in the California Register.

**Cultural Setting.** The term "Cultural resources" is used to describe several different types of properties: prehistoric and historic archeological sites; architectural properties, such as buildings, bridges, and infrastructure; and resources of importance to Native Americans (traditional cultural properties). Artifacts include any objects manufactured or altered by humans.

Prehistoric archeological sites date to the time before recorded history and in this area of the U.S. are primarily sites associated with Native American use before the arrival of Europeans. Archeological sites dating to the time when these initial Native American-European contacts were occurring are referred to as protohistoric. Historic archeological sites can be associated with Native Americans, Europeans, or any other ethnic group. In the project vicinity, these sites could include the remains of historic structures and buildings.

Structures and buildings are considered historic when they are more than 50 years old or when they are exceptionally significant. Exceptional significance can be gained if the properties are integral parts of districts that meet the criteria for eligibility for listing in the National Register or if they meet special criteria considerations.

A traditional cultural property is defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Although normally associated with Native Americans, traditional cultural properties can include those that have significance derived from the role the property plays in any cultural group's or community's historically rooted beliefs, customs, and practices.

**Cultural Resources in the Area of Potential Effects (APE).** Discussion of cultural resources has been provided in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR (Corps, 1998 and 2004 and SAFCA, 2004). The lower and upper basins along Unionhouse Creek were surveyed for cultural resources sites in and adjacent to the project area in reconnaissance studies conducted in 1994 and 1995 (Corps, 2004b). The area of potential effects (APE) in the upper and lower basins was investigated for cultural resources in the 1998 EIS/EIR to include other areas of the project previously not examined in the 1994 or 1995 studies.

**Records and Literature Search.** For the 2004 EA the Corps conducted a records and literature search at the Northwest Information Center at California State University, Sacramento. Based on the records and literature search, there are no recorded prehistoric or historic archeological sites or historic structures within the APE. No properties are listed on, or eligible for, the National Register of Historic Places.

For the 2004 EA, the Corps also requested and received concurrence from the State Historic Preservation Officer (SHPO). Following up on the 2004 consultation, in a letter dated July 9, 2008, the Corps again requested concurrence from the SHPO for the proposed project. Concurrence with the finding of no historic properties affected was received from the SHPO on July 16, 2008 (see Appendix H).

### **3.9.2 Environmental Effects**

**Basis of Significance.** Adverse effects on cultural resources that are listed or eligible for listing on the National Register are considered to be significant. Effects are considered to be adverse if they:

- Alter, directly or indirectly, any of the characteristics of a cultural resource that qualify that resource for the National Register so that the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association is diminished.
- In California, effects to a historic resource or unique archaeological resource are considered to be adverse if they cause a substantial adverse change in the significance of a historical or archaeological resource.

**No Action Alternative.** Under the no action alternative, the Corps would not construct the flood damage reduction features included in the previously authorized SSCSP. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Thus, cultural resources would remain as described in the existing conditions and there would be no effect to these resources.

**Construct Unionhouse Creek Channel Upgrades.** Construction of the Unionhouse Creek Channel Upgrades is anticipated to have a minimal or no effect on cultural resources. There were no identified historical or Native American traditional cultural properties within the defined APE for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. Therefore, it is likely that there would be no effect to cultural resources. However, construction of the Unionhouse Creek

Channel Upgrades could result in damage to previously unidentified buried archaeological and/or human remains during ground disturbing activities of project construction. Disturbance to buried cultural resources would result in a significant effect. Implementation of the mitigation measures presented below would reduce potential effects on cultural resources to less-than-significant.

### **3.9.3 Mitigation**

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR.

Prior to construction, the Corps would complete any additional investigations necessary and then consult with the California State Historic Preservation Office for concurrence with the Corps' findings. To date, no historic properties or Native American traditional cultural properties have been identified in the APE. As a result, no mitigation program for cultural resources is anticipated.

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

If buried cultural resources such as chipped or ground stone, midden deposits, historic debris, building foundations, human bone, or paleontological resources are inadvertently discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a qualified archaeologist or paleontologist can assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with the City and other appropriate agencies.

If remains of Native American origin are discovered during project construction, it will be necessary to comply with state laws concerning the disposition of Native American burials, which fall within the jurisdiction of the California Native American Heritage Commission (NAHC). If any human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- The Sacramento County coroner has been informed and has determined that no investigation of the cause of death is required; and
- If the remains are of Native American origin, the descendants of the deceased Native Americans have made a recommendation to the landowner 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 5097.98; or
- The NAHC has been unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.

### 3.10 Hazardous and Toxic Waste

This section evaluates the effects of the proposed alternatives on hazards and hazardous materials in the project area.

#### 3.10.1 Existing Conditions

This section describes the existing hazardous, toxic, and radiological waste (HTRW) conditions in and near the project area. This includes the regulatory setting, results of Environmental Site Assessments (ESAs) conducted for the project area, and potential for wildland fires. Regulations governing the project area originate at both the Federal and State level, but many are implemented and enforced at the local or regional level. Most hazardous materials regulation and enforcement in Sacramento County is managed by its Environmental Management Department (SCEMD), which refers large cases of hazardous materials contamination or violations to the Regional Water Quality Control Board (RWQCB) and the Department of Toxic Substances Control (DTSC).

**Federal Regulations.** Federal regulatory agencies include the USEPA, the Occupational Safety and Health Administration (OSHA), the Nuclear Regulatory Commission, the Department of Transportation (DOT), and the National Institute of Health. Federal laws and guidelines governing hazardous substances are listed below.

- Pollution Prevention Act (42 United States Code (U.S.C.) 13101 et seq./40 Code of Federal Regulations (CFR)).
- Clean Water Act (33 U.S.C. 1251 et seq./40 CFR).
- Oil Pollution Act (33 U.S.C. 2701-2761/30, 33, 40, 46, 49 CFR).
- Clean Air Act (42 U.S.C. 7401 et seq./40 CFR).
- Occupational Safety and Health Act (29 U.S.C. 651 et seq./29 CFR).
- Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq./40 CFR).
- Comprehensive Environmental Response Compensation and Liability Act (42 U.S.C. 9601 et seq./29, 40 CFR).
- Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq./40 CFR).
- Safe Drinking Water Act (42 U.S.C. 300f et seq./40 CFR).
- Toxic Substances Control Act (15 U.S.C. 2601 et seq./40 CFR).

At the Federal level, the principal agency regulating the generation, transport, and disposal of hazardous substances is the USEPA, under the authority of the Resource Conservation and Recovery Act (RCRA). Under the RCRA, individual states may implement their own hazardous substance management programs as long as they are consistent with, and at least as strict as, RCRA. The USEPA must approve state programs intended to implement the RCRA requirements.

**Hazardous Substances Worker Safety Requirements.** The Federal OSHA is the agency responsible for ensuring worker safety. Federal OSHA sets Federal standards for

implementation of training in the work place, exposure limits, and safety procedures in the handling of hazardous substances (as well as other hazards). Federal OSHA also establishes criteria by which each state can implement its own health and safety program.

**Hazardous Materials Transportation.** The U.S. DOT regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver-training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA.

**State Regulations.** The California Environmental Protection Agency (CEPA) and the State Office of Emergency Services establish rules governing the use of hazardous substances. The State Water Resources Control Board (SWRCB) has primary responsibility to protect water quality and supply. The CEPA was created in 1991 to better coordinate State environmental programs, reduce administrative duplication, and address the greatest environmental and health risks. The CEPA unifies the State's environmental authority under a single accountable, Cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: Air Resources Board, Integrated Waste Management Board, Department of Pesticide Regulation, SWRCB, DTSC, and Office of Environmental Health Hazard Assessment. Applicable State laws include the following:

- Porter Cologne Water Quality Control Act (California Water Code Section 13000-14076/23 California Code of Regulations).
- California Accidental Release Prevention Law (California Health and Safety Code Section 25531 et seq./19 California Code of Regulations).
- California Building Code (California Health and Safety Code Section 18901 et seq./24 California Code of Regulations).
- California Fire Code (California Health and Safety Code Section 13000 et seq./19 California Code of Regulations).
- California Occupational Safety and Health Act (California Labor Code Section 6300-6718/8 California Code of Regulations).
- Hazardous Materials Handling and Emergency Response "Waters Bill" (California Health and Safety Code Section 25500 et seq./19 California Code of Regulations).
- Hazardous Waste Control Law (California Health and Safety Code Section 25100 et seq./22 California Code of Regulations).
- Carpenter-Presley-Tanner Hazardous Substance Account Act "State Superfund" (California Health and Safety Code Section 25300 et seq./California Revenue and Tax Code Section 43001 et seq.).
- Hazardous Substances Act (California Health and Safety Code Section 108100 et seq.).
- Safe Drinking Water and Toxic Enforcement Act "Proposition 65" (California Health and Safety Code Sections 25180.7, 25189.5, 25192, 25249.5-25249.13/8, 22 California Code of Regulations).

- California Air Quality Laws (California Health and Safety Code Section 39000 et seq./17 California Code of Regulations).
- Aboveground Petroleum Storage Act (California Health and Safety Code Section 25270 et seq.).
- Pesticide Contamination Prevention Act (California Food and Agriculture Code Section 13141 et seq./3 California Code of Regulations).
- Underground Storage Tank Law “Sher Bill” (California Health and Safety Code Section 25280 et seq./23 California Code of Regulations).

Within CEPA, the DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the State agency, for the generation, transport, and disposal of hazardous substances under the authority of the Hazardous Waste Control Law.

**Hazardous Substances Worker Safety Requirements.** The State OSHA (Cal OSHA) assumes primary responsibility for developing and enforcing work place safety regulations within the State. Cal OSHA regulations concerning the use of hazardous substances include requirements for safety training, availability of safety equipment, hazardous substances exposure warnings, and emergency action and fire prevention plan preparation. Cal OSHA enforces the hazard communication program regulations, which include provisions for identifying and labeling hazardous substances, describing the hazards of chemicals, and documenting employee-training programs.

**Hazardous Materials Transportation.** California law requires that hazardous waste (as defined in California Health and Safety Code Division 20, Chapter 6.5) be transported by a State-registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance that includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing. A complete list of requirements can be found in Title 22 CCR, Chapter 13. State agencies with primary responsibility for enforcing Federal and State regulations, and responding to hazardous materials transportation emergencies are the California Highway Patrol and the California Department of Transportation (Caltrans). Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roads.

**Environmental Site Assessments.** The Corps completed two ESAs for the 1998 EIS/EIR to identify any potential sources of HTRW in the project area (Corps, 1998 and 2004). The purpose of the ESAs was to identify the presence of a past, existing, or significant threat of a future release of any hazardous substances or petroleum products in or near the project area. The ESAs included a review of regulatory lists of HTRW sites and a records and database search was also conducted. These ESAs encompassed a one-mile corridor on each side of the Unionhouse Creek channel. None of the facilities or sources of potential contamination identified in the ESAs are in the vicinity of the proposed upgrades or improvements.

### 3.10.2 Environmental Effects

**Basis of Significance.** Development of the proposed alternatives would be considered significant if it would result in any of the following:

- 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 into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school (note that no schools are located within one-quarter mile of the project site).
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and as a result would create a significant hazard to the public or the environment.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss or injury involving wildland fires.

**No Action Alternative.** Under the no action alternative, the Corps would not construct the flood damage reduction features included in the previously authorized SSCSP. The risk of flooding and resulting flood damages due to limited channel capacity in the lower Morrison Creek watershed would continue as described in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR. There would be no effects resulting from HTRW in the project area.

**Construct Unionhouse Creek Channel Upgrades.** Construction of the Unionhouse Creek Channel Upgrades is anticipated to have a minimal or no effect resulting from HTRW in the project area. Since the ESAs did not reveal any evidence of any significant hazardous waste or petroleum contamination or threat of contamination in or near the project area, existing HTRW concerns related to the project are not anticipated. During excavation, grading, and construction activities for the project, it is anticipated that limited quantities of miscellaneous hazardous substances such as gasoline, diesel fuel, hydraulic fluid, solvents, and oils would be brought onto the proposed project sites and staging areas. As with any liquid and solid, the potential for an accidental release exists during handling and transfer from one container to another. Depending on the relative hazard of the material, if a spill were to occur of significant quantity, the accidental release could pose a hazard to both construction employees and the environment. Implementation of the Spill Prevention and Response Plan, Erosion and Sediment Control Plan, and SWPPP, each required to be prepared as part of the contract, would reduce this to a less-than-significant effect.

The Unionhouse Creek Channel Upgrades project area is located within a low moderate to high fire hazard severity zone. Construction of the project may introduce potential sources for fire. During construction, equipment and vehicles may come in contact with vegetated areas

within the creek channel and may accidentally spark and ignite the vegetation. Therefore, potential effects related to wildland fires are considered significant. Implementation of the mitigation measures presented below would reduce the risk of wildland fire to a less-than-significant effect.

### **3.10.3 Mitigation**

The mitigation presented below is consistent with previous mitigation that has been developed and approved for the 1998 EIS/EIR, 2004 EA, and 2004 SEIR.

To minimize any potential for wildland fires during construction, the Corps would ensure (through enforcement of contractual obligations) that staging areas, welding areas, or other areas slated for construction using spark-producing or intense heat-producing equipment would be cleared of dried vegetation or other materials that could serve as fire fuel. The contractor would keep these areas clear of combustible materials in order to maintain a firebreak. Any construction equipment that normally includes a spark arrester would be equipped with an arrester in good working order. This includes, but is not limited to, vehicles and heavy equipment.

## **4.0 SOCIOECONOMICS AND GROWTH-INDUCING EFFECTS**

This discussion is based on the results of the U.S. Census taken in 2000. This discussion has not significantly changed from the 2004 EA or 2004 SEIR. Due to continued growth and development in Sacramento County, the population, housing units, and public facilities and services have increased throughout the County. According to the 2000 census, the population of Sacramento County was 1,223,499 (U.S. Census Bureau, 2008). The ethnic composition of Sacramento County in 2000 was about 64 percent white, 10 percent African American, 11 percent Asian, 16 percent Hispanic or Latino, and 2 percent other [exceeds 100 percent because individuals may report more than one race] (U.S. Census Bureau, 2008.)

Based on the 2000 census, the 2007 population estimate for Sacramento County was 1,386,667 (U.S. Census Bureau, 2008). According to the California Department of Finance, the 2010 population estimate for the County is 1,451,866 (California Department of Finance, 2008). Much of this growth is expected in the south Sacramento area because of the availability of land and close proximity to urban Sacramento. Commercial development and public services will continue to expand to support the increased residential population in the area.

The rate of unemployment in Sacramento County for the year 2000 was 4.2 percent (U.S. Census Bureau, 2008), as compared to California's year 2000 estimate for the rate of unemployment at 4.3 percent (California Employment Development Department, 2008). The 2000 median household income was \$43,816, and the per capita income was \$21,142 (U.S. Census Bureau, 2008). Construction of the project would not significantly affect the socioeconomic conditions in the area. The adjacent residential areas to Unionhouse Creek do not represent economically disadvantaged populations or concentrations of minority populations. In addition, the project would not be considered growth-inducing. Even though the proposed project would provide flood protection in the project area to a point that it can safely contain a flood event with a 1% chance of occurrence in any given year, there is a lack of available land in the

regional project area for growth and development because the regional area is already heavily built out and/ or planned for development. The designated land uses, growth rates, employment opportunities, and housing values would continue to be determined by local government regulations and regional economic conditions in the regional project area.

## **5.0 CUMULATIVE EFFECTS**

The NEPA regulations and CEQA guidelines require that an EIS/EIR discuss project effects that, when combined with the effects of other projects, result in significant cumulative effects. The NEPA regulations define a cumulative effect as:

“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor or collectively significant actions taken over a period of time” (40 CFR 1508.7).

The CEQA Guidelines require that an EIR discuss cumulative effects “when they are significant” (Section 15130). The CEQA Guidelines define cumulative effects as “two or more individual effects which, when considered together, compound or increase other environmental impacts” (Section 15355). Additionally, the CEQA Guidelines state: “The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to the other closely related past, present, and reasonable foreseeable probable future projects” (Section 15355).

### **5.1 Local Projects**

Other projects that are within the proposed project vicinity are discussed in Section 1.3.1. These local projects include the Cosumnes River Boulevard Extension Project, the Cosumnes River Boulevard Widening Project, the Freeport Regional Water Authority Pipeline and Intake Project, the Lower Northwest Interceptor Project, the RT South Line Phase 2 Extension Project, and the SASD Central Trunk Sewer Rehabilitation Project. All of these projects are required to evaluate the effects of the proposed project features on environmental resources in the area. In addition, mitigation or compensation measures must be developed to avoid or reduce any adverse effects to less than significant based on Federal and local agency criteria. Those effects that cannot be avoided or reduced to less than significant are more likely to contribute to cumulative effects in the area. Table 5.1 shows the relationship between the proposed project impacts and the impacts identified in the other local project’s environmental documentation.

**Table 5.1 Projects with Potential to Contribute to Cumulative Impacts**

Project	Potential Resource Impacts									
	Land Use and Community Impacts	Vegetation and Wildlife	Special Status Species	Air Quality	Water Resources and Quality	Traffic and Circulation	Noise	Aesthetics/Visual Resources	Cultural Resources	Hazardous and Toxic Waste
<b>South Sacramento County Streams Project</b>	√	√	√	√	√	√	√	√	√	√
<b>Cosumnes River Boulevard Extension</b>		√	√	√	√	√	√	√		√
<b>Freeport Regional Water (Diversion) Project</b>		√	√	√		√	√	√	√	
<b>Sacramento County Regional Sanitation District, Lower Northwest Interceptor</b>	√	√	√	√	√	√	√	√	√	√
<b>South Sacramento Corridor Phase 2</b>	√	√	√	√	√	√	√	√	√	√
<b>Sacramento Area Sewer District, Central Trunk Sewer Rehabilitation Project</b>	√	√	√	√	√	√	√	√	√	

Source: (Corps, 1998), (Corps, 2004b), (SAFCA, 2004), (City of Sacramento, 2006), (Freeport Regional Water Authority, 2003), (SRCSD, 2003), (RT, 2007), and (SASD, 2008)

## 5.2 Cumulative Effects

**Land Use and Community Impacts.** The project is consistent with adopted plans and policies on land use in the project area and would not contribute significantly to cumulative effects on land use.

**Vegetation, Wildlife, and Special Status Species.** Construction of the Unionhouse Creek Channel Upgrades would directly and indirectly affect the giant garter snake and could directly and indirectly affect potential habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, midvalley fairy shrimp, and the California tiger salamander. Construction of additional design refinements authorized by the South Sacramento County Streams Project downstream of the project impact area along with the proposed project could result in cumulative effects to the giant garter snake habitat in the vicinity. Downstream design refinements completed during the fall of 2008 as a part of a separate project are estimated to impact approximately three acres of potential giant garter snake habitat; however, the Corps is undergoing informal consultation with the USFWS and will apply appropriate mitigation measures as recommended to reduce impacts. Mitigation measures in this EA/IS have also been prescribed to offset potential impacts to the giant garter snake along with habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, midvalley fairy shrimp, and the California tiger salamander. Therefore, there would be no significant cumulative effects to the giant garter snake or other special status species as a result of the proposed project. The project could also result in direct and indirect impacts to nesting raptors and other migratory birds including Swainson's hawk, burrowing owl, white-tailed kite, Cooper's hawk, and bridge nesting swallows and black phoebes. Mitigation measures in this EA/IS have been prescribed to offset potential impacts to nesting raptors and other migratory birds. As a result, it is not anticipated that there would be any cumulative effects to nesting raptors and migratory birds.

**Fisheries.** The proposed project is not expected to have an adverse affect on special-status fish species or their habitats: 1) the existing fish habitat is currently poor; 2) Unionhouse Creek does not currently support special-status fish species except during flood events; and, 3) Unionhouse Creek is not designated as Essential Fish Habitat or Critical Habitat. Therefore the project is not anticipated to contribute to a cumulative adverse impact on fisheries.

**Air Quality.** According to SMAQMD, a project is considered to have a significant cumulative effect if:

- The project requires a change in the existing land use designation (general plan amendment or rezone), and
- Projected emissions (ROG or NOx) or emission concentrations (criteria pollutants) of the proposed project are greater than the emissions anticipated for the site if developed under the existing land use designation.
- The project individually would result in a significant effect on air quality.

Construction of the proposed project is not expected to have any long-term effects on air quality since the operational activities (including inspection and maintenance) are expected to be similar to existing conditions. However, construction would result in direct, short-term effects on

air quality mainly related to combustion emissions and dust emissions. Implementation of mitigation measures during construction would reduce emissions to the extent possible. Since the project would not require a change in the existing land use designation, long-term projected emissions of criteria pollutants would be the same with or without the project. In addition, the project individually would not result in a significant effect on air quality. Therefore, the project would not contribute significantly to cumulative effects on air quality.

**Water Resources and Quality.** The project and other local projects could result in accidental spills or leaks that could affect surface and ground water resources. Measures included in each of these projects would be implemented to avoid or reduce these effects to less than significant. The proposed project would not result in negative hydrologic impacts in the project area, and in fact would ensure that the project area can safely contain a flood event with a 1% chance of occurrence in any given year and that the area meets the minimum FEMA level of flood protection. As a result, the proposed project would not contribute significantly to cumulative effects on water resources and quality.

In addition, the proposed project may have an overall positive effect on water quality. By diminishing the possibility for a flood event, this will avoid significant long-term impacts to water quality by avoiding contamination from flooded vehicles, household and industrial chemicals, raw sewage, and other wastes that may be present in the area.

**Traffic and Circulation.** Construction activities associated with the proposed project would contribute to an overall increase in traffic volumes on the existing and planned roadway network on a localized and temporary basis only. Following construction, the proposed project would not contribute to cumulative regional traffic and transportation impacts associated with other projects in the region.

**Noise.** Noise impacts associated with the proposed project would occur primarily during construction and would be short-term in nature. From a long-term operational standpoint, noise from equipment or machinery operation will be mitigated to achieve the necessary noise limits established in the local regulations for noise sensitive locations. Therefore, cumulative noise impacts would be mitigated to a less than significant level.

**Aesthetics and Visual Resources.** The project would result in short-term and long-term changes to the aesthetics in the project area. No trees would be removed during construction of the project. All areas that would be disturbed during construction would be restored and revegetated upon completion of construction activities.

**Cultural Resources.** Based on existing information from literature searches and field examination, no cultural resources were identified in the project area. If necessary, mitigation measures would be implemented to provide for any buried resources that might be uncovered during construction. Since the anticipated effects on known and potential archaeological sites would be less than significant, the project would not contribute significantly to cumulative effects on cultural resources.

**Hazardous and Toxic Waste.** Construction of the proposed project and other reasonably foreseeable future projects in the region could result in the exposure of workers or the public to hazardous materials due to disturbance of contaminated sites, or the unintentional release or spill of hazardous materials. These impacts would be reduced to a less than significant level through the implementation of mitigation measures, including the thorough investigation of the project site prior to construction; clean up of known contaminated sites; use of proper personal protective equipment if contamination were encountered; proper use, handling, and storage of hazardous materials to prevent spills; and adequate Emergency Response Plans (ERPs) that would be implemented in the event of a release or spill.

## **6.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS**

### **6.1 Federal**

#### **6.1.1 Executive Order 11988 (Floodplain Management)**

*Full Compliance.* 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 siting in a floodplain, the agency must minimize potential harm to or in the floodplain and explain why the action is proposed in the floodplain. This EA/IS is proposed to improve existing flood protection facilities and does not directly or indirectly propose floodplain development.

#### **6.1.2 Fish and Wildlife Coordination Act**

*Partial Compliance.* The Fish and Wildlife Coordination Act 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 the Fish and Wildlife Coordination Act is being carried out with the Resource agencies. USFWS provided recommendations for the proposed project, which are included as Appendix D. The CDFG was provided information on the proposed project with opportunity for input. The CDFG will be provided a copy of the draft EA/IS for review.

#### **6.1.3 Archaeological Resources Protection Act of 1979, 16 U.S.C. 470, et seq.**

*Full Compliance.* This act prohibits the removal, sale, receipt, and interstate transportation of archaeological resources obtained illegally (without permits) from public lands. The proposed project would not involve any such archaeological resources.

#### **6.1.4 Clean Air Act of 1972, as amended, 42 U.S.C. 7401, et seq.**

*Partial compliance.* The proposed project would not exceed the USEPA's general conformity *de minimis* threshold or hinder the attainment of air quality objectives in the local air basin. The Corps has determined that the proposed project would have no significant adverse effect on the future air quality of the area. Implementation of BMPs and mitigation measures would be implemented to reduce equipment emissions (including NO<sub>x</sub>) and PM<sub>10</sub> to the extent possible. Thus, the Corps has determined that the proposed project would have no significant effects on the future air quality of the area. A copy of the Draft EA/IS will be provided to the SMAQMD.

#### **6.1.5 Clean Water Act of 1972, as amended, 33 U.S.C. 1251, et seq.**

*Partial compliance.* The proposed project is not expected to adversely affect surface or ground water quality or deplete ground water supplies. BMPs would be implemented to avoid movement of soils or accidental spills. The Corps has determined that the proposed project would have no significant effects on the future water quality of the area.

The contractor would be required to obtain a NPDES permit from the CVRWQCB, since the project would disturb one or more acres of land and involve possible storm water discharges to surface waters. The contractor would also be required to prepare a SWPPP identifying BMPs to be used to avoid or minimize any adverse effects of construction on surface waters. A copy of the Draft EA/IS will be provided to the CVRWQCB.

#### **6.1.6 Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq.**

*Terrestrial Species. Partial compliance.* The project has the potential to result in adverse impacts to the following federally listed threatened and endangered species and/or their habitats: vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, and giant garter snake. In accordance with Section 7(c), the Corps has requested re-initiation of consultation with USFWS to amend the existing Biological Opinion (Ref# 1-1-01-F-0043) for the giant garter snake issued for the South Sacramento County Streams Project on April 15, 2002 stating that the project may affect, but is not likely to adversely affect the giant garter snake. In addition, the Corps has initiated consultation with USFWS for vernal pool fairy shrimp and vernal pool tadpole shrimp to ensure that the project does not result in adverse impacts on these species. USFWS consultation is included as Appendix E. The Biological Opinion for giant garter snake and consultation for the other federally listed species will identify all required terms and conditions, reasonable and prudent measures, and reporting requirements. Mitigation for giant garter snake will likely include, but is not limited to, implementing the USFWS's Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat during construction in aquatic habitat or upland habitat within 200 feet of Unionhouse Creek including the requirement that construction be limited to the period between May 1 and October 1, the active period for the snake. Additional measures such as worker awareness training and biological monitoring for GGS during construction and habitat protection will be implemented as determined appropriate by USFWS. The Corps will also compensate for the permanent loss of 7.62 acres of potential giant garter snake upland habitat through the purchase

of credits at a USFWS approved mitigation bank at a 3:1 ratio. Mitigation for vernal pool fairy shrimp and vernal pool tadpole shrimp may include implementing BMPs and adhering to all project permit requirements in order to prevent water quality impacts to the seasonal wetland. Mitigation measures may also include preservation of seasonal wetland habitat for habitat affected at a ratio of 2:1 at a USFWS approved location and other appropriate mitigation as determined by USFWS. Prior to construction, the habitat suitability of the study area and adjacent wetlands for California tiger salamander will be determined in consultation with USFWS. If suitable habitat for California tiger salamander is determined to be present, the Corps will consult with USFWS to determine if additional mitigation measures are needed above those included in this document for vernal pool branchiopods. Additional measures may include, but are not limited to: (1) biological monitoring during initial construction activities in suitable habitat for this species; (2) worker awareness training to inform construction personnel of the potential occurrence of California tiger salamander; and, (3) proper procedures for protecting the species if it is observed during construction.

*Aquatic Species. Full compliance.* The proposed project is not expected to have an adverse affect on special-status fish species or their habitats because the existing fish habitat is poor; Unionhouse Creek does not currently support special-status fish species except during flood events, and Unionhouse Creek is not designated as Essential Fish Habitat or Critical Habitat. No mitigation is necessary for aquatic species.

#### **6.1.7 Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.**

*Full compliance.* This order directs all Federal agencies to identify and address adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. There are no minority or low-income populations in the project area. All nearby residents would benefit from the proposed flood control measures of the project.

#### **6.1.8 Migratory Bird Treaty Act (15 U.S.C 701-18h).**

*Full compliance.* Construction would be timed to avoid destruction of active bird nests or young of birds that breed in the area. If this is not feasible, a qualified biologist would survey the area prior to initiation of construction. If active nests are located, a protective buffer would be delineated and the entire area avoided, preventing disturbance of nests until they are no longer active.

#### **6.1.9 National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, et seq.**

*Partial Compliance.* This EA/IS is in partial compliance with this act. The document will be released for public comment. Comments received during the public review period will be incorporated into the EA/IS, as appropriate, and a comments and responses appendix will be prepared and included in the final document. The final EA/IS will be accompanied by a signed FONSI, if determined appropriate based on agency coordination and public comments. These actions will provide full compliance with this act.

#### **6.1.10 National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.**

*Full Compliance.* The project is in compliance with Section 106 of this act. Discussion of cultural resources has been provided in the 1998 EIS/EIR, 2004 EA, and 2004 SEIR (Corps, 1998 and 2004 and SAFCA, 2004). The lower and upper basins along Unionhouse Creek were surveyed for cultural resources sites in and adjacent to the project area in reconnaissance studies conducted in 1994, 1995, and 1998 (Corps, 2004b).

For the 2004 EA the Corps conducted a records and literature search at the Northwest Information Center at California State University, Sacramento. Based on the records and literature search, there are no recorded prehistoric or historic archeological sites or historic structures within the APE. No properties are listed on, or eligible for, the National Register of Historic Places. For the 2004 EA, the Corps also requested and received concurrence with this determination from the State Historic Preservation Officer (SHPO). Following up on the 2004 consultation, in a letter dated July 9, 2008, the Corps again requested concurrence from the SHPO for the proposed project. Concurrence with the finding of no historic properties affected was received from the SHPO on July 16, 2008 (see Appendix H)

#### **6.1.11 Farmland Protection Policy Act (7 U.S.C. 4201, et seq).**

*Full compliance.* There are no prime and unique farmlands in the project area.

#### **6.1.12 Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.).**

*Full compliance.* No Wild and Scenic Rivers are within the project area.

#### **6.1.13 Executive Order 11990, Protection of Wetlands.**

*Partial compliance.* The proposed project is not expected to adversely affect wetlands. There are no wetlands in the study area. However, four seasonal wetlands occur within 250 feet of the study area. BMPs will be implemented and all project permit requirements will be adhered to in order to prevent water quality impacts to wetlands in the vicinity of the study area. The contractor would be required to obtain a NPDES permit from the CVRWQCB, since the project would disturb one or more acres of land and involve possible storm water discharges to surface waters. In addition, the contractor would prepare a SWPPP identifying BMPs to be used to avoid or minimize any adverse effects of construction on surface waters.

### **6.2 State**

#### **6.2.1 California Clean Air Act of 1988.**

*Full compliance.* The SMAQMD determines whether project emission sources and emission levels significantly affect air quality based on Federal standards established by the USEPA and State standards set by CARB. The project is in compliance with all provisions of the Federal and State Clean Air Acts.

## **6.2.2 California Endangered Species Act of 1984.**

*Full compliance.* The following State-listed threatened species have the potential to be adversely affected by the proposed project: giant garter snake and Swainson's hawk. In addition, the following State species of concern have the potential to be adversely affected: California tiger salamander, midvalley fairy shrimp, pallid bat, Townsend's big-eared bat, Cooper's hawk, burrowing owl, and white-tailed kite (fully protected). Potential impacts to giant garter snake and California tiger salamander as a result of the proposed project and necessary mitigation measures are being fully coordinated with USFWS (discussed above), the lead agency responsible for stewardship of these species. Mitigation for vernal pool fairy shrimp and vernal pool tadpole shrimp will reduce the potential impacts to midvalley fairy shrimp to less than significant. Preconstruction bat surveys would be conducted to inspect the undersides of the Franklin Boulevard and Center Parkway bridges for roosting bats. If no roosting bats are found, no further mitigation would be necessary. If bats are detected within the roost at the time of construction, excluding any bats from roosts would be accomplished by a bat specialist prior to the onset of any construction activities. If construction is scheduled to occur between March 15 and September 15, preconstruction surveys will be conducted in suitable nesting habitat within 0.5 miles of the study area for Swainson's hawk, within 1,000 feet of the study area for tree nesting raptors including Cooper's hawk and white-tailed kite, and within 500 feet of the project site for burrowing owls. Surveys shall conform to the Swainson's Hawk Technical Advisory Committee (2000) Guidelines and CDFG burrowing owl recommendations, where feasible. If nesting raptors are recorded within their respective buffers, CDFG will be consulted regarding suitable measures to avoid impacting breeding effort.

## **6.2.3 California Environmental Quality Act, California Public Resources Code, Section 21000 et seq.**

*Partial compliance.* The CVFPB as the non-Federal sponsor will undertake activities to ensure compliance with the requirements of this act. CEQA requires the full disclosure of the environmental effects, potential mitigation, and environmental compliance of the proposed project. The draft EA/IS will be distributed for a 30-day public review, and all comments received will be considered and incorporated into the EA/IS, as appropriate. A comments and responses appendix will be prepared and included in the final EA/IS. The final EA/IS will be accompanied by a Mitigated Negative Declaration, if determined appropriate based on agency coordination and public comments. Approval of the Mitigated Negative Declaration and the final EA/IS by the CVFPB will provide full compliance with this act.

## **6.3 Local Plans, Policies, and Requirements**

### **6.3.1 City of Sacramento General Plan.**

*Full compliance.* The project area is located within the jurisdiction of the City of Sacramento General Plan. The proposed project is expected to comply with all of the relevant local plans. All proposed activity involving the placement of encroachments within or under city road rights-of-way must be covered by an encroachment permit. Consultation with appropriate

local agencies, as necessary, to obtain encroachment permits will occur. In addition, all relevant city and county ordinances, such as tree ordinances, will be complied with.

## **7.0 COORDINATION AND REVIEW OF THE DRAFT EA/IS**

The draft EA/IS will be circulated for 30 days to agencies, organizations and individuals known to have a special interest in the project. Copies of the draft EA/IS will be made available for viewing at the local public library. This project has been coordinated with all the appropriate Federal, State, and local government agencies.

## **8.0 FINDINGS**

This EA/IS evaluates the environmental effects of the no action and the proposed action alternative of making design refinements to the previously authorized South Sacramento County Streams Project. Potential adverse effects to the following resources were evaluated in detail: vegetation and wildlife, special status species, air quality, water resources and quality, traffic and circulation, noise, aesthetics, cultural resources, hazardous and toxic waste, and socioeconomics. Results of the evaluation indicate that the proposed action would not result in any significant effects on the environment or that mitigation would reduce environmental effects to less than significant.

Results of the EA/IS, field visits, and coordination with other agencies indicate that the proposed project would have no significant long-term effects on vegetation and wildlife, special status species, air quality, water resources and quality, traffic and circulation, noise, aesthetics, hazardous and toxic waste, and socioeconomics. Short-term effects during construction would either be less than significant or mitigated to less than significance using best management practices.

Based on this evaluation, the proposed project meets the definition of a FONSI as described in 40 CFR 1508.13. A FONSI may be prepared when an action would not have a significant effect on the human environment and for which an environmental impact statement would not be prepared. Therefore, a FONSI will be prepared and will accompany the Final EA/IS.

Title 14 of California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act Article 6 Negative Declaration process Section 15070 states that a public agency shall prepare a proposed Negative Declaration when the Initial Study identifies potentially significant effects, but revisions in the project plans or proposal made by, or agreed to by the applicant before a proposed initial study is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur. Based on the evaluation in this EA/IS, and on the CEQA Guidelines, the proposed project meets the requirements for a Mitigated Negative Declaration. Therefore, a draft Mitigated Negative Declaration will be prepared.

## 9.0 LIST OF PREPARERS

HDR Inc.  
Laurie Warner Herson, Project Manager  
Linda Fisher, Environmental Planner  
Jeanette Winter, Environmental Planner  
Stephen Stringer, Biologist

Brian Buttazoni  
Biological Scientist, Corps of Engineers  
4 years environmental management and environmental studies  
Report preparation and coordination

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[http://factfinder.census.gov/servlet/SAFFPopulation?\\_event=ChangeGeoContext&\\_geo\\_id=05000US06067&\\_geoContext=01000US&\\_street=&\\_county=sacramento&\\_cityTown=sacramento&\\_state=04000US06&\\_zip=&\\_lang=en&\\_sse=on&\\_ActiveGeoDiv=geoSelect&\\_useEV=&\\_pctxt=fph&\\_pgsl=010&\\_submenuId=population\\_0&\\_ds\\_name=null&\\_ci\\_nbr=null&\\_qr\\_name=null&\\_reg=null%3Anull&\\_keyword=&\\_industry=](http://factfinder.census.gov/servlet/SAFFPopulation?_event=ChangeGeoContext&_geo_id=05000US06067&_geoContext=01000US&_street=&_county=sacramento&_cityTown=sacramento&_state=04000US06&_zip=&_lang=en&_sse=on&_ActiveGeoDiv=geoSelect&_useEV=&_pctxt=fph&_pgsl=010&_submenuId=population_0&_ds_name=null&_ci_nbr=null&_qr_name=null&_reg=null%3Anull&_keyword=&_industry=)

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**Personal Communication:**

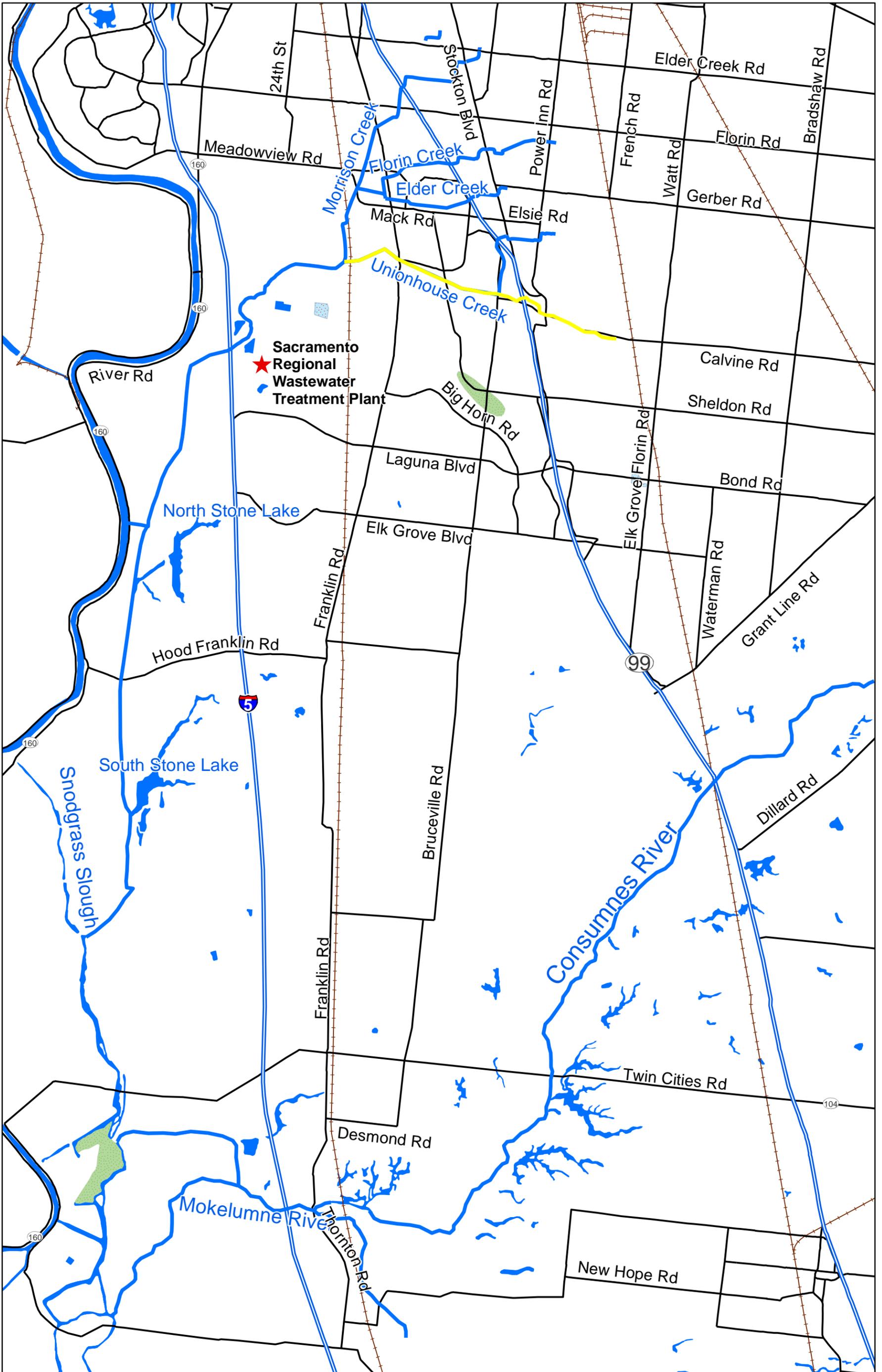
- Jennifer Albright. Natural Resource Specialist. Sacramento Regional County Sanitation District. Conversation on April 23, 2008.

## Plates

## **Plates**

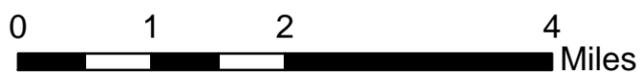
1. State and Vicinity Maps
2. Project Area and access routes
3. Unionhouse Creek Conceptual Cross Section – **needs to be created**
- 4a & 4b. General habitat maps
5. Project Area Photography





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### Unionhouse Creek Channel Upgrades





Project Impact Area

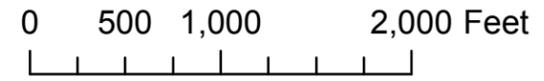
Center Parkway

Franklin Boulevard

Cosumnes River Boulevard

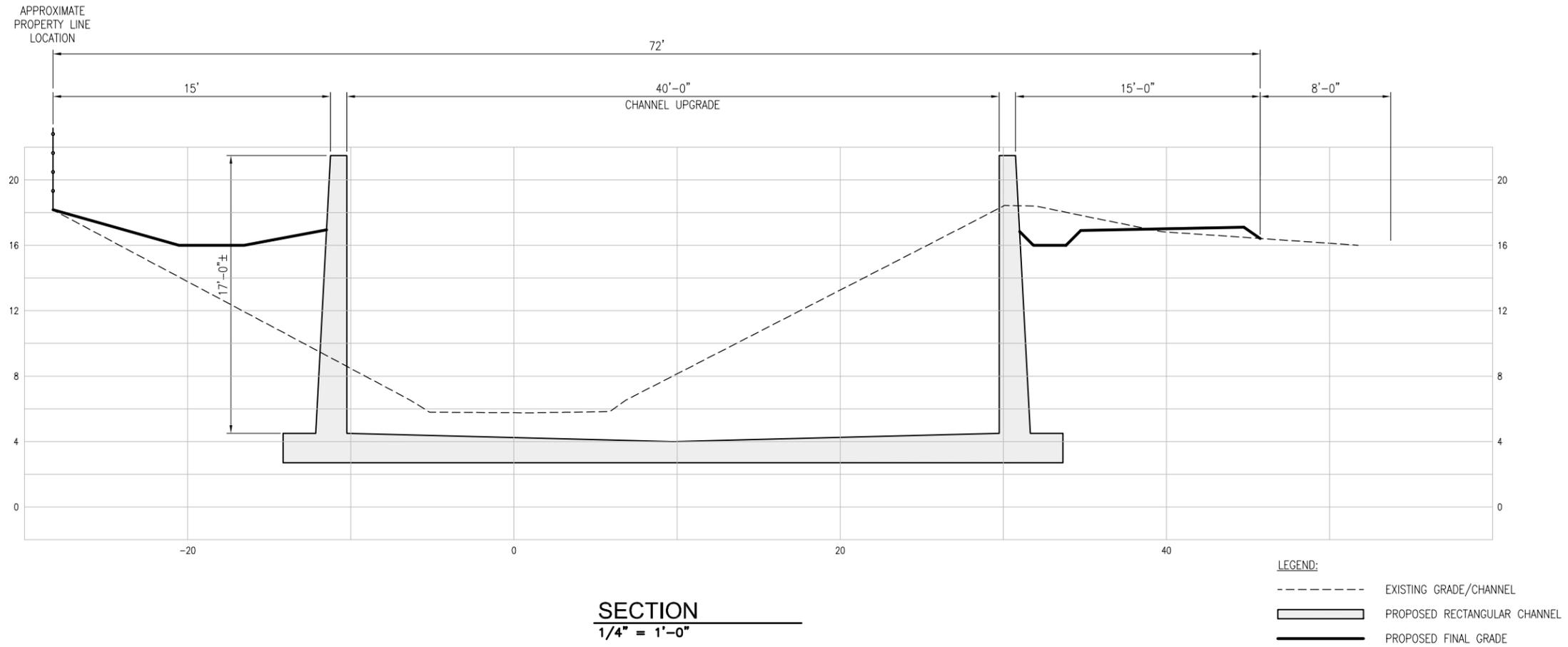
**Legend**

- Construction Access
- Project Impact Area
- Buffer Area



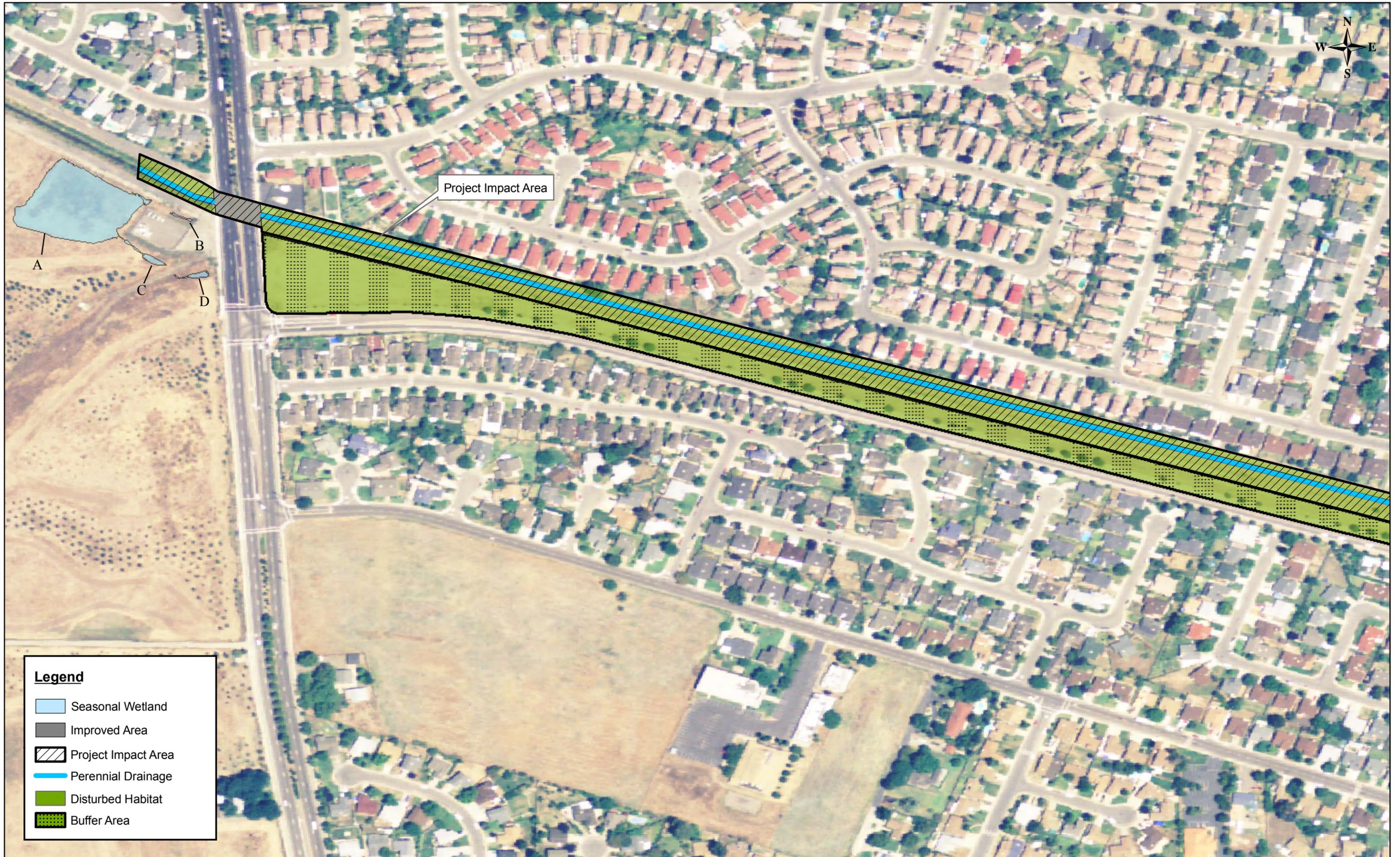
**Project Location and Access Routes**  
PLATE 3

NORTH  
←



SOUTH SACRAMENTO COUNTY STREAMS PROJECT  
UNIONHOUSE CREEK CHANNEL UPGRADES  
CONCEPTUAL CROSS SECTION





Project Impact Area

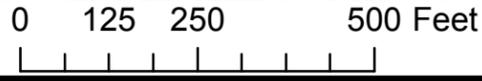
- Legend**
- Seasonal Wetland
  - Improved Area
  - Project Impact Area
  - Perennial Drainage
  - Disturbed Habitat
  - Buffer Area



Project Impact Area

**Legend**

- Improved Area
- Project Impact Area
- Perennial Drainage
- Disturbed Habitat
- Buffer Area



## Plate 6: Site Photos



*Photo 1. View of Unionhouse Creek looking downstream from the Franklin Blvd Bridge (5/16/08).*



*Photo 2. View of Unionhouse Creek looking upstream from the Franklin Blvd bridge (5/16/08).*



*Photo 3. View toward the southwest of the wetland adjacent to the south levee of Unionhouse Creek from the south bank of the Creek (5/16/08).*



*Photo 4. View toward the north of the Franklin Blvd Bridge over Unionhouse Creek from the south bank of Unionhouse Creek in the project area (5/16/08).*



*Photo 5. View of Unionhouse Creek looking upstream from Center Parkway (5/16/08).*



*Photo 6. View of Unionhouse Creek looking upstream from the Franklin Blvd Bridge (6/26/08).*

## **Appendix A**

### **Special Status Species Lists**

California Department of Fish and Game  
Natural Diversity Database  
Selected Elements by Scientific Name - Landscape  
Florin Quad

Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1 <i>Accipiter cooperii</i>	Cooper's hawk	ABNKC12040			G5	S3		SC
2 <i>Actinemys marmorata marmorata</i>	northwestern pond turtle	ARAAD02031			G3G4T3	S3		SC
3 <i>Agelaius tricolor</i>	tricolored blackbird	ABPBXB0020			G2G3	S2		SC
4 <i>Ardea alba</i>	great egret	ABNGA04040			G5	S4		
5 <i>Ardea herodias</i>	great blue heron	ABNGA04010			G5	S4		
6 <i>Athene cunicularia</i>	burrowing owl	ABNSB10010			G4	S2		SC
7 <i>Branchinecta lynchi</i>	vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3		
8 <i>Branchinecta mesovallensis</i>	midvalley fairy shrimp	ICBRA03150			G2	S2		
9 <i>Buteo swainsoni</i>	Swainson's hawk	ABNKC19070		Threatened	G5	S2		
10 <i>Downingia pusilla</i>	dwarf downingia	PDCAM060C0			G3	S3.1	2.2	
11 <i>Juglans hindsii</i>	Northern California black walnut	PDJUG02040			G1	S1.1	1B.1	
12 <i>Legenere limosa</i>	legenere	PDCAM0C010			G2	S2.2	1B.1	
13 <i>Lepidurus packardii</i>	vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3		
14 <i>Linderiella occidentalis</i>	California linderiella	ICBRA06010			G3	S2S3		
15 <i>Northern Hardpan Vernal Pool</i>	Northern Hardpan Vernal Pool	CTT44110CA			G3	S3.1		
16 <i>Nycticorax nycticorax</i>	black-crowned night heron	ABNGA11010			G5	S3		
17 <i>Phalacrocorax auritus</i>	double-crested cormorant	ABNFD01020			G5	S3		SC
18 <i>Pogonichthys macrolepidotus</i>	Sacramento splittail	AFCJB34020			G2	S2		SC
19 <i>Sagittaria sanfordii</i>	Sanford's arrowhead	PMALI040Q0			G3	S3.2	1B.2	
20 <i>Taxidea taxus</i>	American badger	AMAJF04010			G5	S4		SC
21 <i>Thamnophis gigas</i>	giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3		
22 <i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	ABPBXB3010			G5	S3S4		

Sacramento Fish & Wildlife Office  
Federal Endangered and Threatened Species  
that Occur in or may be Affected by Projects in the  
FLORIN (496B)  
U.S.G.S. 7 1/2 Minute Quad  
Database Last Updated: January 31, 2008  
Document Number: 080516014510

**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. See [www.fws.gov/sacramento/es/spp\\_concern.htm](http://www.fws.gov/sacramento/es/spp_concern.htm) for more information and links to these sensitive species lists.

**Red-Legged Frog Critical Habitat** - The Service has designated final critical habitat for the California red-legged frog. The designation became final on May 15, 2006. See our [map index](#).

## 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)

#### *Oncorhynchus tshawytscha*

Central Valley spring-run chinook salmon (T) (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)

**Key:**

- (E) *Endangered* - Listed (in the Federal Register) 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 Marine 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.
- (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.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regard-less of whether they appear on a quad list.

**Plants**

Any plants on your list are ones that have actually been observed in the quad or quads covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the nine 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 plants and 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.

### **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 14, 2008.

## **Appendix B**

### **Regionally Occurring Species Table**

**Appendix B: List of Regionally Occurring Special-Status Plant and Animal Species.**

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
<b>Invertebrates</b>				
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FT/--/--	The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (USFWS 2005).	<b>HP</b>	Seasonal wetland habitats occurring adjacent to the study area provide potential habitat for this species.
<i>Branchinecta mesovallensis</i> Midvalley fairy shrimp	--/SSC/--	Shallow ephemeral pools, vernal swales, and various artificial ephemeral wetland habitats.	<b>HP</b>	Seasonal wetland habitats occurring adjacent to the study area provide potential habitat for this species.
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT/--/--	Valley elderberry longhorn beetle is endemic to the riparian habitats in the Sacramento and San Joaquin Valleys where it resides on elderberry ( <i>Sambucus</i> spp.) plants. The beetle's current distribution is patchy throughout the remaining riparian forests of the Central Valley from Redding to Bakersfield (USFWS 1984).	A	There are no elderberry shrubs in the study area or within 100 feet.
<i>Lepidurus packardi</i> Vernal pool tadpole shrimp	FE/--/--	This animal inhabits vernal pools containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie (USFWS 2005).	<b>HP</b>	Seasonal wetland habitats occurring adjacent to the study area provide potential habitat for this species.
<b>Fish</b>				
<i>Acipenser medirostris</i> Green sturgeon	FT/SSC/--	Green sturgeon is a long-lived, slow-growing fish and the most marine-oriented of the sturgeon species. Green sturgeon are believed to spend the majority of their lives in nearshore	A	There is no suitable habitat for this species in the study area.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		oceanic waters, bays, and estuaries. Early life-history stages reside in fresh water, with adults returning to freshwater to spawn. Today green sturgeon are believed to spawn primarily in the Rogue River, Klamath River Basin, and the Sacramento River. Spawning appears to rarely occur in the Umpqua River, South Fork Trinity River, and Eel River (NOAA Fisheries 2007).		
<i>Hypomesus transpacificus</i> Delta smelt	FT/ST/--	Delta smelt are tolerant of a wide salinity range. They have been collected from estuarine waters up to 14 ppt (parts per thousand) salinity. For a large part of their one-year life span, delta smelt live along the freshwater edge of the mixing zone (saltwater-freshwater interface), where the salinity is approximately 2 ppt. Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse into river channels and tidally-influenced backwater sloughs. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone. Most spawning happens in tidally-influenced backwater sloughs and channel edgewater. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as cattails, tules, tree roots and submerged branches. Delta smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties (USFWS	A	There is no suitable habitat for this species in the study area.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
<p><i>Oncorhynchus mykiss</i> Central Valley Steelhead Distinct Population Segment (DPS)</p>	<p>FT/--/--</p>	<p>1995). Steelhead spawn in rivers and streams with cool, clear, water and suitable substrate. The Central Valley Steelhead distinct population segment includes all naturally spawned anadromous <i>O. mykiss</i> (steelhead) populations below natural and manmade impassable barriers in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries, as well as two artificial propagation programs: the Coleman NFH, and Feather River Hatchery steelhead hatchery programs.</p>	<p>A</p>	<p>There is no suitable habitat for this species in the study area.</p>
<p><i>Oncorhynchus tshawytscha</i> Winter-run Chinook salmon</p>	<p>FE/--/--</p>	<p>Chinook salmon spawn in rivers and streams with cool, clear, water and suitable substrate. The Sacramento winter-run Chinook ESU includes all naturally spawned populations of winter-run Chinook salmon in the Sacramento River and its tributaries in California (59 FR 440; January 1, 1994), as well as two artificial propagation programs: Winter-run Chinook from the Livingston Stone National Fish Hatchery (NFH), and winter run Chinook in a captive broodstock program maintained at Livingston Stone NFH and the University of California Bodega Marine Laboratory.</p>	<p>A</p>	<p>There is no suitable habitat for this species in the study area. Chinook salmon occur in the Beach/ Stone Lakes basin and could potentially get into Unionhouse Creek during major flood events. However, Chinook salmon do not occur in Unionhouse Creek under non-flood conditions and the creek is unsuitable habitat for salmon.</p>
<p><i>Oncorhynchus tshawytscha</i> Central Valley spring-run Chinook salmon</p>	<p>FT/--/--</p>	<p>Chinook salmon spawn in rivers and streams with cool, clear, water and suitable substrate. The Central Valley spring-run Chinook ESU includes all naturally spawned populations of</p>	<p>A</p>	<p>There is no suitable habitat for this species in the study area. Chinook salmon occur in the Beach/ Stone Lakes basin and</p>

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		spring-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River (64 FR 50394; September 16, 1999). One artificial propagation program is considered part of the ESU: The Feather River Hatchery spring run Chinook program.		could potentially get into Unionhouse Creek during major flood events. However, Chinook salmon do not occur in Unionhouse Creek under non-flood conditions and the creek is unsuitable habitat for salmon.
<i>Oncorhynchus tshawytscha</i> Central Valley Fall/ Late Fall Run Chinook Salmon	FSC/--/--	Chinook salmon spawn in rivers and streams with cool, clear, water and suitable substrate. The ESU includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin River Basins and their tributaries, east of Carquinez Strait, California.	A	There is no suitable habitat for this species in the study area. Chinook salmon occur in the Beach/ Stone Lakes basin and could potentially get into Unionhouse Creek during major flood events. However, Chinook salmon do not occur in Unionhouse Creek under non-flood conditions and the creek is unsuitable habitat for salmon.
<i>Pogonichthys macrolepidotus</i> Splittail	-/SSC/-	Reside in floodplains and backwater areas with flooded vegetation for spawning and rearing. Spawns on submerged vegetation. Spawning occurs in the lower reaches of rivers, bypasses used for flood management, and various sloughs.	A	There is no suitable habitat for this species in the study area. Splittail are not known to occur in Unionhouse Creek or elsewhere in the Beach/ Stone Lakes watershed.
<b>Amphibians</b>				
<i>Ambystoma californiense</i> California tiger salamander	FT/SSC/--	California tiger salamanders are generally restricted to vernal pools and seasonal ponds, including many constructed stockponds, in grassland and oak savannah plant communities from sea level to about 1,500 feet in central	<b>HP</b>	The study area provides suitable habitat for this species but it has never been observed at the Bufferlands or within 10 miles.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		California (USFWS 2008).		
<i>Rana aurora draytonii</i> California red-legged frog	FT/SSC/--	The California red-legged frog occupies a fairly distinct habitat, combining both specific aquatic and riparian components. The adults require dense, shrubby or emergent riparian vegetation closely associated with deep (greater than 2 1/3-foot deep) still or slow moving water. The largest densities of California red-legged frogs are associated with deep-water pools with dense stands of overhanging willows ( <i>Salix</i> spp.) and an intermixed fringe of cattails ( <i>Typha latifolia</i> ). Well-vegetated terrestrial areas within the riparian corridor may provide important sheltering habitat during winter (USFWS 2002).	A	The study area does not provide suitable habitat for this species.
<b>Reptiles</b>				
<i>Actinemys marmorata</i> Western pond turtle	--/SSC/--	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms vegetated with watercress, cattails, waterlilies, or other aquatic vegetation in woodlands, grasslands, and open forests	A	The study area does not provide suitable habitat for this species.
<i>Thamnophis gigas</i> Giant Garter Snake	FT/ST/--	Primarily found in marshes and sloughs. May be found in slow-moving creeks but are absent from large rivers. They are generally aquatic but often bask on emergent vegetation such as cattails and tules.	<b>HP</b>	Unionhouse Creek provides marginal habitat for this species.
<b>Mammals</b>				
<i>Antrozous pallidus</i> Pallid bat	--/SSC/--	Found in deserts, grasslands, shrublands, woodlands, and forests. It is most common in open dry habitats with rocky areas for roosting.	<b>HP</b>	Bridges in the study area provide potential roosting habitat for this species.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Feeds mainly in open areas on beetles and other large insects, often landing on ground to catch prey. Roosts in caves, rock crevices, buildings, on the undersides of bridges. Roosts must be sufficient to protect this species from high temperatures. Pallid bat is extremely sensitive to human disturbance of roosting sites.		
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	--/CSC/--	Found throughout California in nearly all habitats except alpine and subalpine zones. This species is typically associated with caves or cave-like structures, which it usually uses for roosting habitat. However, this species has been reported roosting in large hollows of redwood trees, in attics and abandoned buildings, in lava tubes, and under bridges (Gruver and Keinath 2006).	<b>HP</b>	Bridges in the study area provide potential roosting habitat for this species.
<i>Taxidea taxus</i> American badger	--/SSC/--	In California, Badgers occupy a diversity of habitats. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and mountain meadows near timberline are preferred.	A	There is no suitable habitat for this species in the study area.
<b>Birds</b>				
<i>Accipiter cooperii</i> Cooper's hawk	--/SSC/--	Cooper's hawks nest in deciduous trees or conifers in crotches or cavities that are usually 20 to 50 feet off the ground. The nest is a stick platform lined with bark. Nests are usually placed in second growth coniferous stands or in the deciduous riparian areas that are closest to streams.	<b>P</b>	Cooper's hawk is recorded in CNDDDB as nesting in the vicinity and was observed adjacent to the study area. Potential nesting and foraging habitat for this species occurs in and adjacent to the study area.

<b>Scientific Name/ Common Name</b>	<b>Federal/State/ CNPS Status</b>	<b>General Habitat Description</b>	<b>Habitat Present/ Absent</b>	<b>Rationale</b>
<i>Agelaius tricolor</i> Tri-colored blackbird	--/SSC/--	Common locally throughout central California. Nests and seeks cover in emergent wetland vegetation, specifically cattails and tules. Nesting area must be large enough to support a minimum colony of 50 pairs as they are a highly colonial species. Forages on ground in croplands, grassy fields, flooded land, and edges of ponds.	A	There is no suitable habitat for this species in the project area.
<i>Ardea alba</i> Great egret	--/--/--	Nest in large trees in riparian areas and along lakes, usually in areas that lack a high level of human disturbance. Rookeries are protected from disturbance during the nesting season by the DFG.	A	There is no suitable nesting habitat for this species in the study area or vicinity. This species may forage in the study area but foraging habitat for this species is not protected.
<i>Ardea herodias</i> Great blue heron	--/--/--	Nest in large trees in riparian areas and along lakes, usually in areas that lack a high level of human disturbance. Rookeries are protected from disturbance during the nesting season by the DFG.	A	There is no suitable nesting habitat for this species in the study area or vicinity. This species may forage in the study area but foraging habitat for this species is not protected.
<i>Athene cunicularia</i> Burrowing owl	--/SSC/--	Resides in open, dry annual or perennial grasslands, deserts, and scrublands with low growing vegetation. This species nests underground in existing burrows created by a number of burrowing mammals, most often ground squirrels.	<b>HP</b>	Suitable nesting and foraging habitat for this species occurs in the study area.
<i>Buteo swainsoni</i> Swainson's hawk	--/ST/--	Forages in grasslands, suitable grain or alfalfa fields, or livestock pastures adjacent to nesting habitat. Nests on large trees in open areas.	<b>P</b>	There is no suitable nesting habitat for Swainson's hawk in the study area, but foraging habitat is present. Swainson's

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
				hawk was observed adjacent to the study area during surveys.
<i>Elanus leucurus</i> White-tailed kite	--/FP/--	Occurs primarily in rolling foothills and valley margins with scattered oaks as well as river bottomlands or marshes next to deciduous woodland. Uses isolated, dense topped, trees in open areas for nesting and perching and forages in a variety of habitats including grassland, marshes, and agricultural fields. Feeds on rodents, snakes, and insects.	<b>P</b>	There is no suitable nesting habitat for white-tailed kite in the study area, but foraging habitat is present. An active nest occurs approximately 1,700 ft west of the study area along the north levee of Unionhouse Creek.
<i>Nycticorax nycticorax</i> Black-crowned night heron	--/--/G5, S3	Breeds in wetlands and along the margins of lakes, ponds, and rivers in the Central Valley. Forages mostly on fish but also eats aquatic invertebrates, reptiles, amphibians, and small mammals.	A	There is no suitable habitat for this species in the project area.
<i>Phalacrocorax auratus</i> Double-crested cormorant	--/--/G5, S3	Breeds in coastal areas as well as near inland rivers and lakes. Builds stick nests in trees, on cliff edges, or on the ground on suitable islands and are often found in colonies with other aquatic. Feeds primarily on fish but will eat amphibians and crustaceans.	A	There is no suitable habitat for this species in the project area.
<i>Xanthocephalus xanthocephalus</i> Yellow-headed blackbird	--/--/--	Fairly common breeder in the Central Valley. Nests in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or ponds. Forages in emergent vegetation, along moist shorelines, and in nearby croplands, preferably near water or on moist ground. Nests only where large insects, such as odonates, are abundant and times nesting with maximum emergence of aquatic	A	There is no suitable habitat for this species in the project area.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		insects.		
<b>Plants</b>				
<i>Downingia pusilla</i> Dwarf downingia	--/--/2.2	An annual herb found in valley and foothill grasslands and vernal pools from an elevation of 1-445 meters. Known to occur in Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties. Blooms March to May (CNPS 2008).	A	There is no suitable habitat for this species in the project area.
<i>Gratiola heterosepala</i> Boggs Lake hedge hyssop	--/SE/1B	This species is found in shallow waters or moist clay soils of vernal pools and lake margins in scattered sites from Modoc County south to Fresno County.	A	There is no suitable habitat for this species in the project area.
<i>Juglans hindsii</i> Northern California black walnut	--/--/1B.1	A deciduous tree found in riparian woodlands and riparian forests from an elevation of 0-440 meters. Known to occur in Alameda, Butte, Contra Costa, Lake, Napa, Sacramento, Solano, Sonoma, and Yolo counties. Blooms April to May.	A	There is no suitable habitat for this species in the project area.
<i>Juncus leiospermis</i> var. <i>ahartii</i> Ahart's dwarf rush	--/--/1B	This species is found in mesic habitats in valley and foothill grassland; such as vernal pools, swales, and seasonal wetlands from 30 to 100 meters in elevation. Known to occur in Butte, Calaveras, Placer, Sacramento, Tehama, and Yuba counties. Blooms March to May (CNPS 2008).	A	There is no suitable habitat for this species in the project area.
<i>Legenere limosa</i> Legenere	--/--/1B.1	An annual herb found in vernal pools from an elevation of 1 to 880 meters. Known to occur in Alameda, Lake, Napa, Placer, Sacramento,	A	There is no suitable habitat for this species in the project area.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Santa Clara, Shasta, San Joaquin, San Mateo, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties. Blooms April to June (CNPS 2008).		
<i>Navarretia myersii</i> Pincushion navarretia	--/--/1B.1	An annual herb found in vernal pools from an elevation of 20 to 330 meters. Known to occur in Amador, Calaveras, Merced, Placer, and Sacramento counties. Blooms May (CNPS 2008).	A	There is no suitable habitat for this species in the project area.
<i>Orcuttia tenuis</i> Slender Orcutt grass	FT/SE/1B	Found in vernal pools from an elevation of 35 to 1,760 meters. Known to occur in Butte, Lake, Lassen, Modoc, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties. Blooms May to October (CNPS 2008).	A	There is no suitable habitat for this species in the project area.
<i>Orcuttia viscida</i> Sacramento Orcutt grass	FE/SE/1B	Found in vernal pools from an elevation of 30 to 100 meters. This species is only known from seven occurrences, all in Sacramento County. Blooms April to July (CNPS 2008).	A	There is no suitable habitat for this species in the project area.
<i>Sagittaria sanfordii</i> Sanford's arrowhead	--/--/1B.2	A rhizomatous emergent perennial herb found in assorted, shallow, freshwater, marshes and swamps including sloughs and drainage ditches from 0 to 650 meters in elevation. Currently known to occur in Butte, Del Norte, Fresno, Merced, Mariposa, Orange, Placer, Sacramento, Shasta, San Joaquin, Tehama, and Ventura counties. Blooms May to October (CNPS 2008).	<b>HP</b>	Unionhouse Creek provides potential habitat for this species.
<b>Natural Communities</b>				
Northern hardpan vernal pool	--/--/--	Shallow ephemeral water bodies found in depressions with indurated clay or cemented hardpan. Found in grasslands and open	A	This community does not occur in the study area or within 250 feet.

Scientific Name/ Common Name	Federal/State/ CNPS Status	General Habitat Description	Habitat Present/ Absent	Rationale
		woodlands.		

**Notes:**

Absent [A] - no habitat present in the Action Area and no further work needed. Habitat Present [HP] -habitat is, or may be present in the Action Area. The species may be present. Present [P] - the species is present in the Action Area.

**Listing Status:**

**Federal Listing Status Under the Federal Endangered Species Act**

- FE = Federal Endangered
- FT = Federal Threatened
- FC = Federal Candidate for Listing

**State Listing Status Under the California Endangered Species Act**

- SE = State Endangered
- ST = State Threatened
- SR = State Rare
- SSC = State Species of Special Concern
- FP = Fully Protected

**California Native Plant Society (CNPS)**

- 1B = Rare, threatened, or endangered in California and elsewhere
  - 1B.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
  - 1B.2 = Fairly endangered in California (20-80% occurrences threatened)
  - 1B.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)
- 2 = Rare, threatened, or endangered in California but more common elsewhere.
  - 2.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
  - 2.2 = Fairly endangered in California (20-80% occurrences threatened)
  - 2.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

**Global Rank (Only listed for species with no Federal or State listing status)**

- G1 = Less than 6 viable element occurrences OR less than 1,000 individuals OR less than 2,000 acres.
- G3 = 21-80 element occurrences OR 3,000-10,000 individuals OR 10,000-50,000 acres.

**State Rank (Only listed for species with no Federal or State listing status)**

S1 = Less than 6 element occurrences OR less than 1,000 individuals OR less than 2,000 acres

S1.1 = very threatened

S2 = 6-20 element occurrences OR 1,000-3,000 individuals OR 2,000-10,000 acres

S2.1 = very threatened

S3 = 21-80 element occurrences or 3,000-10,000 individuals OR 10,000-50,000 acres

S3.1 = very threatened

**Other Codes**

-- indicates that there is no listing status

MBTA = Covered by the Migratory Bird Treaty Act

**Source of list:**

CNDDDB search for “Florin” 7.5 Minute USGS Quadrangle; USFWS online list of federal endangered and threatened species that occur in or may be affected by projects on the “Florin” USGS Quadrangle; and other published and unpublished information on wildlife, fisheries, and plant resources contained in the HDR/SWRI library.

## **Appendix C**

### **List of Plant and Animal Species Observed**

## Appendix C: List of Plant and Animal Species Observed

PLANT SPECIES OBSERVED		
Family	Scientific Name	Common Name
<b>Dicots</b>		
Amaranthaceae		
	<i>Salsola tragus</i>	Russian tumbleweed
Apiaceae		
	<i>Foeniculum vulgare</i>	Wild fennel
Apocynaceae		
	<i>Nerium oleander</i>	Oleander
Asteraceae		
	<i>Achyrachaena mollis</i>	Blow wifes
	<i>Carduus pycnocephalus</i>	Italian thistle
	<i>Centaurea solstitialis</i>	Yellow star-thistle
	<i>Chamomila suaveolens</i>	Pineapple weed
	<i>Cichorium intybus</i>	Chicory
	<i>Grindelia sp.</i>	Gumplant
	<i>Lactuca serriola</i>	Prickly lettuce
	<i>Picris echioides</i>	Bristly ox-tongue
	<i>Senecio vulgaris</i>	Butterweed
	<i>Silybum marianum</i>	Milk thistle
	<i>Sonchus oleraceus</i>	Annual sowthistle
	<i>Tragopogon sp.</i>	Goats beard
Boraginaceae		
	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Intermediate fiddleneck
Brassicaceae		
	<i>Brassica nigra</i>	Black mustard
	<i>Lepidium latifolium</i>	Perennial pepperweed
	<i>Raphanus sativus</i>	Wild radish
Convolvulaceae		
	<i>Convolvulus arvensis</i>	Field bindweed
Euphorbiaceae		
	<i>Eremocarpus setigerus</i>	Turkey mullein
Fabaceae		
	<i>Lotus corniculatus</i>	Bird's-foot deerweed
	<i>Medicago polymorpha</i>	Bur clover
	<i>Trifolium hirtum</i>	Rose clover
	<i>Vicia sativa</i>	Common vetch
	<i>Vicia villosa</i>	Hairy vetch
Geraniaceae		
	<i>Erodium botrys</i>	Storksbill

	<i>Erodium cicutarium</i>	Red-stemmed filaree
	<i>Erodium moschatum</i>	White-stemmed filaree
	<i>Geranium dissectum</i>	Cut-leaved geranium
Lythraceae		
	<i>Lythrum</i> sp.	Loosestrife
Malvaceae		
	<i>Malvella leprosa</i>	Alkali mallow
Moraceae		
	<i>Ficus carica</i>	Edible fig
Myrsinaceae		
	<i>Anagallis arvensis</i>	Scarlet pimpernel
Oleaceae		
	<i>Fraxinus latifolia</i>	Oregon ash
Onagraceae		
	<i>Epilobium brachycarpum</i>	Willowherb
	<i>Epilobium ciliatum</i>	Watson's northern willowherb
	<i>Ludwigia</i> sp.	Primrose
Papaveraceae		
	<i>Eschscholzia californica</i>	California poppy
Plantaginaceae		
	<i>Plantago lanceolata</i>	English plantain
Polygonaceae		
	<i>Rumex crispus</i>	Curly dock
Zygophyllaceae		
	<i>Tribulus terrestris</i>	Puncture vine
<b>Monocots</b>		
Cyperaceae		
	<i>Cyperus eragrostis</i>	Sedge
Juncaginaceae		
	<i>Juncus bufonius</i>	Toad rush
Poaceae		
	<i>Avena</i> sp.	Wild oat
	<i>Bromus diandrus</i>	Ripgut brome
	<i>Bromus hordeaceus</i>	Soft chess
	<i>Cynodon dactylon</i>	Bermuda grass
	<i>Hordeum murinum</i>	Barley
	<i>Hordeum murinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley
	<i>Lolium multiflorum</i>	Italian ryegrass
	<i>Paspallum dilatatum</i>	Dallis grass
	<i>Poa annua</i>	Annual bluegrass
	<i>Vulpia myuros</i>	Rattail fescue
Typhaceae		
	<i>Typha</i> sp.	Cattail

<b>ANIMAL SPECIES OBSERVED</b>	
<b>Scientific Name</b>	<b>Common Name</b>
	<b>Birds</b>
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Anas platyrhynchos</i>	Mallard
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Charadrius vociferus</i>	Killdeer
<i>Elanus leucurus</i>	White-tailed kite
<i>Fulica arericana</i>	American coot
<i>Hirundo rustica</i>	Barn swallow
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Petrochelidon pyrrhonota</i>	Cliff swallow
<i>Sayornis nigricans</i>	Black phoebe
<i>Sturnella neglecta</i>	Western meadowlark
<i>Sturnus vulgaris</i>	Starling
<i>Tyrannus verticalis</i>	Western kingbird
<i>Zenaida macroura</i>	Mourning dove

## **Appendix D**

### **Fish and Wildlife Service Coordination Act Report**



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Sacramento Fish and Wildlife Office  
2800 Cottage Way W-2605  
Sacramento, California 95825

In reply refer to:  
81420-2008-FA-0522

AUG 6 2008

Mr. Francis C. Piccola  
Chief, Planning Division  
Sacramento District  
U.S. Army Corps of Engineers  
1325 J Street  
Sacramento, CA 95814-2922

Subject: Draft Supplemental Fish and Wildlife Coordination Act Report for South Sacramento County Streams Project; Unionhouse Creek Channel, Sacramento, California

Dear Mr. Piccola:

This letter is the U.S. Fish and Wildlife Service's (Service) draft Supplemental Fish and Wildlife Coordination Act (FWCA) report for the U.S. Army Corps of Engineers' (Corps) South Sacramento County Streams Project, Unionhouse Creek Channel in South Sacramento County, California. This report has been prepared under the authority of, and in accordance with, the provisions of section 2(b) of the FWCA (48 stat.401, as amended; 16 U.S.C. 661 et seq.).

The Corps, the Central Valley Flood Protection Board (CVFPB), and the Sacramento Area Flood Control Agency (SAFCA) propose additional design refinements to the previously authorized South Sacramento County Streams Project. The proposed action includes channel upgrades, bridge retrofitting and drop structure construction along 5,520 feet of Unionhouse Creek. This action would ensure that flood protection in the area meets the minimum Federal Emergency Management Agency certifiable 100-year level of flood protection.

The information provided herein is based on: (1) the Corps' June 26, 2008, letter requesting concurrence with their determination of "may affect but not likely to adversely affect" the giant garter snake (*Thamnophis gigas*) (GGS); (2) information from a draft Environmental Assessment/Initial Study report received July 7, 2008, via e-mail; (3) an April 30, 2008, site visit conducted by Stephanie Rickabaugh of the Service and Brian Buttazoni of the Corps; and (4) information in existing files at the Service's Sacramento Fish and Wildlife Office.

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IN AMERICA 

## **PROJECT BACKGROUND**

Unionhouse Creek is located in South Sacramento on land owned and managed by the City of Sacramento. Unionhouse Creek is on the northern boundary of the Bufferlands, property owned and managed by the Sacramento County Regional Sanitation District. The Bufferlands are comprised of 2,650 acres of undeveloped wetlands, grasslands and riparian forest habitat that serves as a buffer zone between the Sacramento County Regional Wastewater Treatment Plant and surrounding neighborhoods.

## **ALTERNATIVES DESCRIPTION**

### **Alternative 1, The No-Action Alternative**

This alternative would leave the proposed project site and habitats in their current condition. The surrounding area would likely experience flood events similar to those described in the 1998 Environmental Impact Statement/Environmental Impact Report, 2004 Environmental Assessment, and 2004 Supplemental Environmental Impact Report without implementing the proposed Unionhouse Creek channel upgrades.

### **Alternative 2, Unionhouse Creek Channel Upgrades**

The proposed action consists of re-designing 5,520 feet of stream channel on Unionhouse Creek, beginning 200 feet downstream (west) of Franklin Boulevard and ending 200 feet upstream (east) of Center Parkway. The purpose of the proposed work is to increase channel carrying capacity to prevent flooding during high flow events. Project features and construction details including plans for channel excavation, bridge retrofitting, drop structure placement, equipment, personnel and scheduling, restoration, operation and maintenance plans for the Unionhouse Creek channel upgrades are described below.

### **Project Features**

The Corps, CVFPB, and SAFCA have proposed a rectangular concrete-lined stream channel design to upgrade and replace the current low flow trapezoidal channel in Unionhouse Creek between Franklin Boulevard and Center Parkway. The current channel would be deepened about 2 feet and widened about 32 feet. The new rectangular concrete stream channel dimensions would be 42 feet wide and 7 feet deep. Twelve foot-wide access roads would be constructed on both the north and south sides of Unionhouse Creek for maintenance operations.

This design would allow a greater volume of water to flow down the channel with reduced friction making it more efficient during high water events. In addition to the proposed channel modifications, the bridges located on Franklin Boulevard and Center Parkway would require retrofitting to promote unimpeded flow of water past the structures. The concrete channel underneath both bridges would be removed and select foundation piers would be excavated along with spread footings. New spread footings would be constructed using reinforced concrete. The Center Parkway Bridge would require in-fill walls in addition to new lower spread footings at each pier. Construction of a drop structure is proposed downstream of the Center

Parkway Bridge. The drop structure would serve to prevent erosion in the stream channel where a gradient change currently exists where the newly excavated channel merges into the existing channel. The drop structure would have a 15 foot-wide apron on the upstream side to prevent scouring and resultant sediment buildup that would occur at the structure.

## **BIOLOGICAL RESOURCES - IMPACTS and DISCUSSION**

The Corps intends to avoid and minimize impacts on wildlife and their habitats through appropriate utilization of existing infrastructure. Transport of equipment and materials would take place on local roadways and existing service roads. Equipment entry into the stream channel would occur on existing ramps or new temporary ramps that would be constructed if needed. Temporary cofferdams would be utilized to facilitate in channel construction. All staging and construction would occur inside the channel or on the levee crest. Any vegetation removed from the creek channel and its banks would be disposed of in a landfill. Concrete removed from the bottom of Unionhouse Creek would be disposed of at an authorized concrete disposal site. However, impact to eight acres of upland habitat would occur due to increases in the height of the concrete along the channel. This upland habitat consists of ruderal vegetation which reside on the slopes of the channel. Once construction is complete, all areas that were disturbed would be reseeded with native grasses to replace removed vegetation and to minimize erosion.

### **Special Status Species**

In a letter to the Service, dated June 26, 2008, the Corps requested reinitiation of the Unionhouse Creek Channel Project under section 7 of the Endangered Species Act to address its affects on the federally threatened GGS. While there is currently no critical habitat designated for the GGS, the Unionhouse Creek Channel Project area does contain suitable GGS habitat. The proposed work would occur during the GGS active season, May 1, 2009, through October 2009. The section 7 consultation with the Service is underway.

### **Recommendations**

The Service recommends that the Corps implement the following if the South Sacramento County Streams Project; Unionhouse Creek Channel work is pursued.

1. Avoid impacts to migratory birds, including burrowing owls, and their habitats by complying with the Migratory Bird Treaty Act.
2. Avoid and minimize impacts to fish and wildlife resources and their habitats when selecting staging areas and by utilizing existing access routes and entry points to the Unionhouse Creek channel during construction, as well as for routine maintenance and post-construction activities.
3. Minimize impacts to all disturbed areas of the construction site and staging areas by re-seeding grasslands with native annual grasses at the completion of construction activities.

4. Minimize impacts to wildlife and their habitats by utilizing eco-friendly erosion control materials.
5. Minimize impacts to vegetation during construction activities and by re-seeding areas with native vegetation at the completion of the project, as identified on in the project description under the section titled "Restoration."
6. Contact the California Department of Fish and Game regarding potential impacts to State-listed species.

If you have any questions or comments regarding this letter, please contact Jeremy Redding at (916) 414-6577.

Sincerely,



M. Kathleen Wood  
Assistant Field Supervisor

cc:

Brian Buttazoni, Corps, Sacramento, California  
California Department of Fish and Game, Region 2, Rancho Cordova, California

## **Appendix E**

### **USFWS Consultation**



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

Environmental Resources Branch

SEP 19 2008

Ms. Susan Moore, Field Supervisor  
U.S. Fish and Wildlife Service  
2800 Cottage Way, Suite W2605  
Sacramento, California 95825-1846

Dear Ms. Moore:

This letter requests your concurrence with our determination of "may affect but not likely to adversely affect" the giant garter snake (*Thamnophis gigas*) (GGS), vernal pool fair shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardii*) for Unionhouse Creek Channel Upgrades which is a part of the South Sacramento County Streams project. In addition, the Corps requests reinitiation of formal Section 7 consultation to amend your Biological Opinion (Ref # 1-1-01-F-0043) issued for the South Sacramento County Streams Project on April 15, 2002.

The Corps proposes to upgrade the channel of Unionhouse Creek for approximately 5,800 feet, from 200 feet downstream (west) of Franklin Boulevard to 200 feet upstream (east) of Center Parkway (Enclosure 1). The primary purpose of this effort is to increase the creek's capacity to handle higher flows of water during flood events. The creek bed has a low-flow, concrete-lined trapezoidal channel that is 12 feet wide on the bottom and is 68 feet wide on the top.

The creek bed would be reshaped into a rectangular channel. The channel bottom would be deepened about 2 feet and widened about 32 feet toward the south (Consumnes River Boulevard) bank. The rectangular channel would be approximately 42 feet wide by 17 feet deep. The walls of the channel on the south side would extend 2 to 3 feet above ground level and on the north side would extend 2 to 5 feet above ground level. A 15-foot wide maintenance road would be constructed on the south side of the channel. Bridge retrofitting would occur at the Franklin Boulevard and Center Parkway bridges to accommodate the wider channel.

Work on this project would occur in 2009 or 2010 and would take at least six months to complete. This portion of Unionhouse Creek is immediately adjacent to Consumnes River Boulevard. Although the area is highly urbanized, Unionhouse Creek has been characterized by the Service as marginal GGS habitat (Enclosures 2-4).

There are no areas proposed or designated as critical habitat or any records in the California Natural Diversity Database for GGS in Unionhouse Creek. The existing creek has a low-flow channel concrete bottom lining and is mostly absent of wetland vegetation.

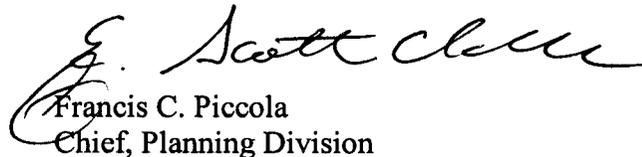
Ongoing maintenance of the low-flow channel includes removal of all vegetation to allow for unobstructed flow of water. Ongoing maintenance of the grassy bank slopes includes mowing operations to reduce the fire hazard. The proposed refinements to the creek channel would result in the permanent loss of 7.62 acres of migratory bank/upland GGS habitat and would temporarily disturb an additional 1.6 acres of marginal aquatic GGS habitat.

Based on the Service's designation of Unionhouse Creek as GGS habitat, the Corps will implement measures to avoid and minimize effects on GGS during construction (Enclosure 5). The Corps proposes to compensate for the permanent loss of 7.62 acres of migratory GGS habitat through the purchase of credits at a Service-approved mitigation bank at a ratio of three to one (22.86 credits). As an initial step, in September 2008, the Corps purchased 5 credits for GGS from Westervelt Ecological Services LLC (Sutter Basin Conservation Bank in Sutter County). Although this project is outside this bank's service area, no other conservation banks for GGS credits are available at this time. With the uncertainty of the project's start date the Corps proposes to complete the purchase of the remaining 17.86 credits by the end of construction, possibly in 2010 or 2011.

Construction activities will occur within 250 feet of potential habitat (seasonal wetlands) for the vernal pool fairy shrimp and vernal pool tadpole shrimp. The seasonal wetlands are located outside the project impact area and are on adjacent property owned by the City of Sacramento and Sacramento Regional County Sanitation District. All work will occur in or immediately adjacent to the creek channel; no work would occur within these wetlands. Protocol level surveys have not been carried out to determine whether or not shrimp are present. The Corps will carry out avoidance measures to ensure the potential habitat is not indirectly or directly affected by the proposed action (Enclosure 6).

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

Sincerely,

  
Francis C. Piccola  
Chief, Planning Division

Enclosures

Copies Furnished:

Mr. Jeremy Redding, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room W-2605,  
Sacramento, California 95825-1846

## **Appendix F**

### **Unionhouse Creek Channel Upgrade Project – Road Construction Emissions Model, Version 6.2**

## Road Construction Emissions Model, Version 6.2

<b>South Sacramento County Streams Project</b>					Exhaust	Fugitive Dust	
<b>Unionhouse Creek Channel Upgrades</b>							
Emission Estimates for ->							
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	
Grubbing/Land Clearing	5	23	40	10		2	8
Grading/Excavation	9	58	68	11		3	8
Drainage/Utilities/Sub-Grade	5	20	37	10		2	8
Paving	4	11	18	2		2	0
Maximum (pounds/day)	9	58	68	11		3	8
<b>Total (tons/construction project)</b>	0.45	2.07	3.51	0.60		0.17	0.44
Notes: Project Start Year -> 2009 Project Length (months) -> 6 Total Project Area (acres) -> 9 Maximum Area Disturbed/Day (acres) -> 1 Total Soil Imported/Exported (yd <sup>3</sup> /day)-> 456 PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified. Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.							

<-tons

<b>South Sacramento County Streams Project</b>					Exhaust	Fugitive Dust	
<b>Emission Estimates for -&gt;</b>							
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	PM10 (kgs/day)	
Grubbing/Land Clearing	2	10	18	4		1	4
Grading/Excavation	4	26	31	5		1	4
Drainage/Utilities/Sub-Grade	2	9	17	4		1	4
Paving	2	5	8	1		1	0
Maximum (kilograms/day)	4	26	31	5		1	4
<b>Total (megagrams/construction project)</b>	0.41	1.88	3.19	0.55		0.15	0.40
Notes: Project Start Year -> 2009 Project Length (months) -> 6 Total Project Area (hectares) -> 4 Maximum Area Disturbed/Day (hectares) -> 0 Total Soil Imported/Exported (meters <sup>3</sup> /day)-> 349 PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified. Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.							

<-megagrams

## **Appendix G**

### **Section 404(b)(1) Analysis for South Sacramento County Streams, Unionhouse Creek Channel Upgrades**

**SECTION 404(b)(1) ANALYSIS  
FOR SOUTH SACRAMENTO COUNTY STREAMS  
UNIONHOUSE CREEK UPGRADES,  
SACRAMENTO, CALIFORNIA  
SEPTEMBER 2008**

Section 404 of the Clean Water Act requires approval by the U.S. Army Corps of Engineers for discharge of dredged or fill material into waters of the United States. This approval is contingent upon the project complying with the guidelines of Section 404(b)(1) of the Clean Water Act. These guidelines are summarized as follows:

- Least Environmentally Damaging Practicable Alternative (LEDPA)-There must be no practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.
- No Violation of Other Laws-The project must not cause or contribute to violation of State water quality standards or toxic effluent standards; must not jeopardize the continued existence of federally listed endangered and threatened species or their critical habitats; and must not violate any requirement to protect marine sanctuaries.
- No Significant Degradation-The project must not cause or contribute to significant degradation of the waters of the United States.
- Minimize and Mitigate Adverse Impacts-The project must include appropriate and practicable steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

The following measures were developed and analyzed either during the reconnaissance phase or early in the feasibility phase of the project. These measures were eliminated from further consideration because: (1) they failed to meet the project flood control goals; (2) the costs exceeded the benefits; or (3) the associated environmental effects were excessive.

**Alternative 1** – Concrete-Lined Trapezoidal Channel with 2H:1V Side Slopes: this alternative was evaluated using the same side slopes as recommended in the LRR and a model was run as if the channel was concrete-lined. This was done to determine if any improvement in channel performance would be offset by narrowing the bottom width of the channel. The minimum allowable bottom width of the channel was set at 10 feet.

**Alternative 2** – Concrete-lined trapezoidal channel with 1.5H:1V side slopes: this alternative was evaluated using the same bottom width as recommended in the LRR and a model was run as if the channel was concrete-lined with 1.5:1 side slopes. This was done to determine if any improvement or reduction in channel performance would be offset by adjusting the bottom width of the channel. The bottom width of the channel was set at 10 feet. Alternative 2 would extend upstream of Center Parkway to the confluence of Unionhouse Creek and Strawberry Creek.

**Alternative 3** – Stone Gabion-Lined Channel with 1H:1V Side Slopes: this alternative was evaluated using the same bottom width as recommended in the LRR, and a model was run as if the channel was lined with stair-stepped stone gabions. It was assumed that the exposed vertical and horizontal faces of the gabions would be three feet. This was done to determine if any improvement or reduction in channel performance would be offset by adjusting the bottom width of the channel. The minimum allowable bottom width of the channel was set at 10 feet.

After initial hydraulic modeling was developed for Alternative 3, it was determined that the cross-section geometry was inadequate and was causing unacceptable increases in water surface elevations. Therefore, the channel geometry for Alternative 3 was altered to reflect a bottom width of 26 feet and 1.5:1 Side Slopes. It was assumed that the exposed vertical faces of the gabion are three feet and horizontal faces of the gabion would be 4.5 feet.

**Alternative 4** – Concrete-Lined Channel with a bottom width of 18 feet, a vertical south bank, and north bank with 1.5H:1V Side Slope: Alternative 4 was evaluated and a model was run as if the channel was concrete-lined with a vertical bank to the south (left bank) and with 1.5:1 side slope for the north bank (right bank). The bottom width of the channel was set at 18 feet. This was done to determine if any improvement or reduction in the width of the typical cross-section could be achieved. This alternative was analyzed between Franklin Boulevard and Center Parkway with the LRR design as the base condition.

Based on the results of the evaluation of the alternatives it was determined that Alternative 2 and Alternative 4 necessitate a significant increase in right-of-way necessary to construct improvements and Alternatives 1 and 3 do not. Alternative 4 provides a slightly higher gain in right of way and a marginal increase in the level of flood protection than Alternative 2. However, the feasibility of constructing Alternative 4 is expected to be less than Alternative 2 due to the inclusion of a vertical structural wall along the south bank of Unionhouse Creek. For these reasons and because Alternatives 1, 2, 3, and 4 would not meet the stated purpose and need of the proposed action, these alternatives were eliminated from further consideration.

## **I. Project Description**

### **a. Location**

The South Sacramento County Streams Project area is located in the lower elevations of the Morrison Creek watershed. Most of the watershed is in the Sacramento Valley, while the eastern-most parts of the watershed are in the lower foothills of the Sierra Nevada. Generally, the Morrison Creek watershed lies south and east of the City of Sacramento. The “Morrison Creek stream group” includes Morrison, Florin, Elder, and Unionhouse Creeks. Unionhouse Creek in the project area is located in southern Sacramento County (**Plate 1** in the EA/IS) on land owned and managed by the City of Sacramento.

Unionhouse Creek is located within the Beach/Stone Lakes basin, a system of streams, lakes, and floodplains that drains the area southeast of Laguna and Elk Grove Creeks and the Morrison Creek watershed. The Beach/Stone Lakes basin receives runoff from approximately 49 square miles of local urban and rural tributary areas and ultimately discharges through the Lambert Road structure into Snodgrass Slough, a tributary of the Mokelumne River and the Sacramento-San Joaquin Delta. The Lambert Road structure is a flap gate designed to allow one-way flow out of North and South Stone Lakes into Snodgrass Slough. An additional water control valve at the Lambert structure can also be opened to allow flow from Snodgrass Slough back into South Stone Lake (SRCSD, 2000).

Historically the Beach/Stone Lakes basin was an overflow area of the Sacramento River (SRCSD, 2000). The primary streams in the Beach/Stone Lakes basin are Morrison Creek and its major tributaries: Elder Creek, Florin Creek, Laguna Creek, and Unionhouse Creek. Unionhouse Creek empties into Morrison Creek less than one mile downstream of the study area. During non-flood conditions, there is no direct hydrologic connectivity between Unionhouse Creek and the Sacramento River (SAFCA, 2004). During these periods, water is pumped from Morrison Creek into the Sacramento River by the City of Sacramento (SAFCA, 2004). Regional hydrology of the Morrison Creek watershed is shown on Plate 2 in the EA/IS.

Unionhouse Creek in the project area flows west of Franklin Boulevard along the northern edge of the Bufferlands. The Bufferlands was established in the 1970s by the Sacramento Regional County Sanitation District (SRCSD) as a planned large undeveloped buffer area between the Sacramento County Regional Wastewater Treatment Plant and surrounding neighborhoods. The Bufferlands encompasses 2,650 acres of managed wetlands, grasslands, and riparian forest habitat.

The proposed project impact area (**Plate 3** in the EA/IS) evaluated for the purpose of this Environmental Assessment/Initial Study (EA/IS) includes an area approximately 72 feet wide

centered along the segment of Unionhouse Creek from approximately 200 feet upstream (east) of Center Parkway to approximately 200 feet downstream (west) of Franklin Boulevard. The project impact area includes a 15 foot wide offset on the north side of the creek, 42 feet wide improvements to the creek, and 15 foot wide offset on the south side of the creek. A maintenance road would be located within the 72 feet wide project impact area between the Franklin Boulevard Bridge and the Center Parkway Bridge. (**Plate 4** in the EA/IS)

A buffer area (**Plate 3** in the EA/IS) adjacent to Unionhouse Creek between the creek and Cosumnes River Boulevard would be used for temporary staging and material disposal and will also be evaluated in this EA/IS. Excavated material from Unionhouse Creek not used for backfill purposes would either be sold or disposed of at an appropriate waste site authorized to accept such waste. The buffer area is vacant and approximately 50 feet wide and covers nearly 6.6 acres. Construction access routes for the project would be along Cosumnes River Boulevard, Franklin Boulevard, and State Route 99. (**Plate 3** in the EA/IS)

## **b. General Description**

The proposed design refinements in this EA/IS are refinements to the feasibility-level plan in the 1998 EIS/EIR, which identified the Consistent High Protection Plan as the selected plan. The primary difference between the original design and the refined design is the increase in channel capacity through channel excavation, bridge retrofits, and box culverts. Due to constrained rights-of-way availability as a result of other planned projects in the vicinity, additional channel upgrades are being proposed that were not initially identified in the 1998 EIS/EIR, 2004 EA, or 2004 SEIR.

The proposed action consists of upgrading the channel of Unionhouse Creek for approximately 5,800 feet, from 200 feet downstream (west) of Franklin Boulevard to 200 feet upstream (east) of Center Parkway (**Plate 3** in the EA/IS). The primary purpose of this effort is to increase the creek channel's capacity to handle higher flows during flood events. Unionhouse Creek currently has a low-flow, concrete-lined trapezoidal channel that is 12 feet wide on the bottom and 68 feet wide on the top. The proposed action includes reshaping the creek bed and channel into a rectangular concrete lined channel.

Rectangular concrete channels are typically used to increase channel capacity by shaping the channel cross-section into a rectangular shape and lining the channel with concrete. The shape of the channel combined with the concrete lining reduces friction in the channel so channel velocity and volume are increased while water surface elevations are decreased. A rectangular concrete channel is proposed for the project area due to the limited rights-of-way available. In limited areas, rectangular channels can be more efficient than trapezoidal channels.

The channel bottom would be deepened approximately two feet and widened approximately 32 feet toward the south bank. The rectangular concrete channel would be approximately 40 feet wide by 17 feet deep. The concrete channel would extend above grade on both sides of the channel. On the south side the extended concrete channel would be two to three feet above ground level and on the north side it would be two to five feet above ground level. The above ground extension of the concrete channel would have a uniform thickness of approximately one foot on either side. The extension of the concrete channel contributes to the structural integrity of the rectangular channel. A vegetated swale would be constructed within the 72 feet wide project impact area. The vegetated swale would serve both a water quality function and a drainage function for the project area. A 15-foot wide maintenance road would also be constructed within the 72 feet wide project impact area between the eastern edge of the Franklin Boulevard Bridge and the western edge of the Center Parkway Bridge. Flap gates would be periodically spaced over the length of the rectangular channel to convey drainage from the vegetated swale and the maintenance road into the channel.

In-channel construction methods would be utilized. The Franklin Boulevard and Center Parkway bridges would be retrofitted with parapet walls to pass water more efficiently under the bridges during pressure flow conditions.

### **Construction Details**

**Channel Excavation.** Channel excavation would involve deepening the channel and widening the existing channel to increase the volume of the channel. Equipment and materials would be transported on local roadways to the construction sites. Existing ramps would be used to access the channel, when possible, or temporary ramps would be constructed, if needed. Existing service roads would also be used, if available. Staging areas would be along the existing channel banks and could also be within the channel. Channel excavation would be conducted using in-channel construction methods. First, the channel would be dewatered by installing temporary cofferdams and diverting stream flow around the section to be excavated. Unionhouse Creek channel has a concrete low-flow channel bottom; channel deepening would require removal of the existing concrete low-flow channel. Old concrete would be removed and disposed of at an appropriate waste site authorized to accept concrete waste. The total volume of concrete to be removed would be approximately 10,000 cubic yards. Vegetation on the channel banks and bottom would then be cleared and transported to the nearest dump or landfill for disposal.

Excavated material from Unionhouse Creek not used for backfill purposes would be temporarily staged on the adjacent buffer area (**Plate 3** in the EA/IS) and would either be sold or disposed of at an appropriate waste site authorized to accept such waste. The total volume of cleared vegetation and soil to be excavated and removed is approximately 89,500 cubic yards.

From Franklin Boulevard to Center Parkway, the channel depth would be excavated approximately two feet. The bottom width of the channel would be increased to 40 feet wide toward the south bank. The new right-of-way area for Unionhouse Creek would be limited to 72 feet to accommodate proposed improvements and projects in the immediate area. A conceptual cross section drawing of the proposed project is shown in **Plate 4** of the EA/IS.

The concrete channel would be constructed after excavation and other design measures are complete. The concrete would be allowed the appropriate amount of time to cure. As construction is completed in each stream section, equipment would be removed from the staging area. The cofferdam would then be removed, and stream flow would be diverted back into the stream channel.

**Bridge Retrofitting.** Bridge retrofitting would involve modifying a bridge's structure to ensure unimpeded passage of flows under the bridge. Prior to the refined design, proposed bridge modifications included concrete aprons, new parapet walls, in-fill walls, and plugging of deck drains. Both bridges in the project area have concrete channels under them. Once the concrete channel is removed, selected foundation piers would be excavated, and the spread footing would be removed. A new spread footing at the correct elevation would be constructed using reinforced concrete. Temporary shoring would be used to support the affected portion of the bridge during this work. In addition, the Center Parkway Bridge would be retrofitted with in-fill walls and new, lower spread footings at each pile.

**Drop Structures.** Drop structures, or weirs, would be constructed in the channel where there is a need to avoid potential erosion due to grade breaks. Grade breaks are anticipated at or near the upstream end of the project area where the excavated channel would merge with the existing channel. Typical construction of drop structures would entail shallow excavation, construction of concrete forms, and placement of reinforced concrete. Where necessary, drop structures would be stepped to allow for fish passage. The drop structures/weirs would include a 15-foot concrete apron upstream of the drop structure to prevent channel scouring and resultant sediment buildup at the drop structure. As with channel excavation, drop structures would be constructed while

cofferdams are in place and stream flow is diverted around the construction area. There would be one drop structure constructed downstream of the Center Parkway Bridge on Unionhouse Creek.

**Staging and Disposal Sites.** Staging areas for equipment would be located primarily within the channel. The location of the staging areas would depend on the channel segment being dewatered and excavated. Temporary equipment staging would also take place in the area southeast of the Franklin Boulevard Bridge between the creek and Cosumnes River Boulevard in case of rain events.

Several disposal sites would be used depending on the type of material. Old concrete from the low-flow channel would be disposed at an approved waste site authorized to accept concrete waste. Cleared vegetation from the channel would be transported to the nearest dump or landfill for disposal. As stated previously, excavated material from Unionhouse Creek not used for backfill purposes would be temporarily placed on the vacant area adjacent to the creek between Franklin Boulevard and Center Parkway and would either be sold or disposed of at an appropriate waste site authorized to accept such waste.

**Construction Equipment and Personnel.** Equipment and personnel to be used for the design refinements would be similar to those needed for the original design. An estimated five to ten workers would be onsite each day during construction. These workers would access the area via regional and local roadways, and would park their vehicles in the staging area. Construction hours would be limited daily from 7:00 a.m. to 6:00 p.m. Monday thru Saturday, and 9:00 a.m. to 6:00 p.m. on Sundays.

**Access Routes.** Access routes to and from the project area would be the same as identified in the 1998 EIS/EIR. Access to Unionhouse Creek would be from State Route 99, Cosumnes River Boulevard, and Franklin Boulevard.

**Schedule.** Construction of the Unionhouse Creek channel upgrades would take place in 2009 or 2010 and would last at least six months.

### **c. Authority and Purpose**

Authorization for channel upgrades in Unionhouse Creek was provided by the South Sacramento County Streams Project. The South Sacramento County Streams Project was authorized in the Water Resources Development Act of 1999 (Public Law 106-53). The Record of Decision for the 1998 EIS/EIR was provided by the Chief of Engineers on June 28, 2000. This authorization also serves as authorization for the additional refinements to the South Sacramento County Streams Project (i.e., the current project under consideration).

### **d. General Description and Quantity of Dredged or Fill Material**

#### **(1) General Characteristics of Material**

Dredged material: concrete from low flow channel (10,000 cubic yards); silty sand loam to silty clay loam and vegetation from channel banks (89,500 cubic yards)  
Fill material: concrete (rectangular channel after excavation)

#### **(2) Source of Material**

Dredged material: Unionhouse Creek  
Fill material: Commercial cement plant

## **e. Description of the Proposed Discharge Site**

### (1) Location (map)

See **Plate 1** in EA/IS.

### (2) Size and Amount of Fill Material

For dredged material temporary placement site: 6.6 acres (adjacent to Cosumnes River Boulevard); commercial concrete recycling plant; appropriate waste disposal site  
For fill material (construct rectangular channel): 10 acres

### (3) Type of Site (confined, unconfined, open water)

For dredged material: the disposal site will be a confined facility that will not allow discharge to any jurisdictional waters.

For fill material: the concrete to be placed in the creek channel for construction of the rectangular channel while cofferdams are in place. This confined state of the fill placement areas will be maintained until concrete has cured.

### (4) Type(s) of Habitat

For dredged material temporary placement site: grassland

For concrete fill material: concrete rectangular channel in creek bed.

Unionhouse creek is a freshwater perennial stream. The creek is surrounded by high intensity land uses, which have limited the diversity and quality of the habitats in the creeks. In general, previous channel improvements and regular maintenance activities have cleared most riparian and emergent wetland vegetation in the creek bed and suppressed re-growth. The creek bank is vegetated primarily with non-native grasses and forbs typical of disturbed areas such as wild oat (*Avena* sp.), bromes (*Bromus* spp.), barley (*Hordeum* spp.), wild radish (*Raphanus sativa*), and fennel (*Foeniculum vulgare*). Some herbaceous hydrophytic species occur intermittently in the disturbed habitat along the lower portions of the creek banks adjacent to the concrete lined low flow channel. The hydrophytic vegetation is included in the disturbed habitat rather than as part of the channel because it is growing out of the bank and not in the channel itself. Because it is growing out of the bank it is mowed regularly. Species observed along the edge of the existing channel include water primrose (*Ludwigia* sp.), sedge (*Cyperus* sp.), and curly dock (*Rumex crispus*).

### (5) Timing and Duration of Discharge

Temporary placement of excavated/dredged material from the creek channel into the buffer area adjacent to the south bank of the Creek would take place during the low flow summer months (May to September in 2009 or 2010). Construction of the concrete low flow channel in the creek bed would also take place during the same time period. Duration of dredge and/or fill material placement would be for a duration of at least six months.

## **f. Description of Disposal Method (hydraulic, drag line)**

A cofferdam will be utilized to divert creek flows around the reach of Unionhouse Creek under construction. After the channel bed is sufficiently dry, channel excavation/dredging with excavators, and concrete rectangular channel construction would take place in the dewatered creek

bed. Following completion of construction in the dewatered creek bed, including complete curing of concrete, the cofferdam would be removed. Excavated material would be trucked to an appropriate disposal site.

## **II. Factual Determinations (Section 230.11)**

### **a. Physical Substrate Determinations (consider items in Section 230.11 and 230.20 Substrate)**

#### **(1) Substrate Elevation and Slope**

Unionhouse Creek has nearly a flat gradient. The amount of slope from the starting point of construction (200 feet downstream of the Franklin Boulevard bridge) to the end (200 feet upstream of Center Parkway bridge) is less than two percent, with an elevation change less than of 10 feet.

#### **(2) Sediment Type**

Dominant soils in the Unionhouse Creek are the Clear Lake Clay and Galt Clay soils, formed in alluvium derived from mixed rock sources. Slopes in this series range from 0 to 2 percent. These soils are moderately deep and consist of a silt loam at the surface, with a subsoil of clay pan underlain by cement hardpan.

#### **(3) Dredged/ Fill Material Movement**

Dredged material will be completely removed from the channels only after placement of a cofferdam; therefore, there will be no movement of dredged material within the water column. Fill material will have no movement within the water column because the concrete fill will be allowed to cure before the cofferdam is removed and water is redirected back to the restored channel.

#### **(4) Physical Effects on Benthos (burial, changes in sediment type)**

Excavation of the creek bottom would remove existing benthos from the creek systems at the dredge location. However, benthos populations would be expected to return to pre-construction conditions through downstream migration of upstream populations. In general the sediment type is not anticipated to change.

#### **(5) Actions Taken to Minimize Effects (Subpart H)**

Loss of dredge material back into the creek channel during excavation will be minimized by use of a cofferdam to divert creek flows which would allow the creek bed to dry prior to excavation. Best management practices would be used during construction to minimize erosion and sedimentation caused by storm water runoff.

### **b. Water Circulation, Fluctuation, and Salinity Determinations**

#### **(1) Water (refer to Sections 230.11(b), 230.22 Water, and 230.25 Salinity Gradients; test specified in subpart G may be required). Consider effects on:**

General water chemistry—including salinity, eutrophication, dissolved gases, and physical characteristics of the water such as color, odor, and taste— is not expected to change as a result of the proposed project refinements.

Construction would take place during low flow summer months. The project would not be expected to have an effect on increased turbidity or water clarity following construction. Long-term water clarity is expected to return to pre-project conditions or better. The proposed project refinements are not expected to have an effect on dissolved oxygen levels.

Excavation of the channel sediment/bottom would remove nutrients originating from urban and runoff containing fertilizer. Removal of these nutrients from the creek channels during dry conditions would probably have a beneficial effect to water quality in the short term; however, long term nutrient levels in these creeks would probably return to pre-project conditions following completion of project construction.

## (2) Current Patterns and Circulation (consider items in Sections 230.11(b) and 230.23) Current Flow and Water Circulation)

### (a) Current Patterns and Flow

Gradients similar to the existing creek slope would be maintained with the proposed design refinements. Design refinements would change the nature of the creek channel from a trapezoidal to rectangular shape. The creek bottom would be significantly widened to increase the capacity for flows. Velocity of flow, stratification, and hydrologic regime would remain unchanged.

## (3) Normal Water level Fluctuations (tides, river stage) (consider items in Sections 230.11(b) and 230.24)

The proposed design refinements would not affect water level fluctuations within the creek. The channel would still experience flashy flow conditions during storm events with much lower flow conditions during dry weather.

## (4) Salinity Gradients (consider items in Sections 230.11(b) and 230.25)

There are no significant changes in salinity anticipated as a result of the proposed design refinements.

## (5) Actions That Will Be Taken to Minimize Effects (refer to Subpart H)

Downstream flow will be maintained throughout construction of the proposed design refinements through use of a diversion pipe and a cofferdam. Best management practices will be implemented during construction to minimize erosion and sedimentation downstream. A spill prevention, control, and countermeasure plan will be prepared and appropriate materials will be onsite to minimize the potential and magnitude of spills occurring during construction.

## **e. Suspended Particulate/Turbidity Determinations**

### (1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site (consider items in Sections 230.11(c) and 230.21)

There would be no discharge of material into waters of the U.S. as a result of placement of excavated materials into the identified disposal sites. The placement and removal of a cofferdam into the creek channel during construction would result in a short-term, localized increase in turbidity levels within the creek water.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column (consider environmental values in Section 230.21, as appropriate)

(a) Light Penetration

The project may have short-term adverse impacts during construction due to turbidity plumes. However, these effects on light penetration would be considered less than significant due to the isolated and short-term nature of these construction-related actions.

(b) Dissolved Oxygen

The proposed design refinements would have no adverse effects on dissolved oxygen in the creek.

(c) Toxic Metals and Organics

Construction of the proposed design refinements could cause a short-term increase in levels of pesticides if present in the water column due to disturbance of sediments. However, the majority of in-stream construction activities would take place in dry conditions because of temporary diversion of water flow. This would minimize opportunities for the disturbed compounds to become suspended in the water column. In addition, removal of dredged material from the creek would also be removing accumulated organics from the creek system. Therefore, although construction of the project has the potential to cause a temporary minor increase in levels of these organics, proposed construction techniques would significantly minimize any potential increases and removal of sediments containing these accumulated organics would have a long-term beneficial effect on the water column.

(d) Pathogens

The proposed design refinements would have no adverse effects on or introduce pathogens in the creek.

(e) Esthetics

Construction of the Unionhouse Creek Channel Upgrades would have both short-term and long-term effects on the esthetics. During construction, the presence and use of equipment, trucks, and worker vehicles would disrupt the current viewshed. Residents north of Unionhouse Creek would be aware of the movement of vehicles in the proximity of their back property lines. However, all direct construction activities would be contained to the Unionhouse Creek channel and banks and therefore would be shielded from residents. In addition, all equipment, trucks, and worker vehicles would be removed once construction is completed.

All disturbed areas would be restored. Disturbed areas would be reseeded with native grasses to promote revegetation. The staging areas would also be reseeded and planted with native trees and shrubs. The grasses, as well as annuals and some small shrubs, would be expected to grow relatively quickly and restore that part of the viewshed within one to two years.

Residents and motorists in the area would have a limited view of the proposed maintenance road and channel upgrades due to existing barriers and fences that would minimize any adverse effects of the visual quality of the proposed project. The proposed extension of the concrete channel above grade could provide additional areas for graffiti. Both residents and motorists in the area may have a limited view of any graffiti on the extended concrete channel

walls due to existing barriers and fences that would minimize any adverse effects of the visual quality of the proposed project. The channel walls would provide minimal area for graffiti to exist and the area would be restricted from access by the public.

### (3) Effects on Biota (consider environmental values in Section 230.21, as appropriate)

The construction actions of establishing and removing cofferdams and reintroduction of creek flows back to the channel following construction would create short-term increases in turbidity, deposition, and elevated water temperatures downstream. However, these actions are not expected to have a measurable long-term effect on photosynthetic organisms, suspension/filter feeders, or sight feeders within the water column. Those organisms entrained within the portions of the creek channel that are being dewatered by diverting flow would be lost from the system during excavation of the channel bottom. However, the vast majority of biota within the water column would not be affected because downstream flow would be maintained throughout construction and most biota would remain within the water column being diverted.

### (3) Actions Taken to Minimize Effects (Subpart H)

Implementation of the following best management practices would be implemented to minimize effects:

- Prepare a spill control plan and a SWPPP prior to initiation of construction activities. The SWPPP would be developed in accordance with guidance from the CVRWQCB. These plans would also be reviewed and approved by the Corps.
- Implement appropriate measures to prevent any debris, soil, rock, or other construction activities from getting into the water. The contractor will use appropriate measures to control dust on the project site and stockpiles.
- Properly dispose of oil or liquid wastes.
- Fuel and maintain vehicles in specified areas that are designed to capture spills.
- Inspect and maintain vehicles and equipment to prevent dripping of oil and other fluids.
- Schedule construction to avoid as much of the wet season as possible. If rains are forecast during the construction period, erosion control measures would be implemented as described in the CVRWQCB Erosion and Sediment Control Field Manual.
- Train construction personnel in stormwater pollution prevention practices.
- Revegetate and restore areas cleared by construction in a timely manner to control erosion.

In addition, the Unionhouse Creek channel section under construction would be dewatered by installing temporary cofferdams and by diverting streamflow through a culvert and around the channel section to be excavated. When construction is completed, the cofferdam would be removed, and flow would enter the new channel. The concrete lining of the channel would be allowed the appropriate time to cure before flow is returned to the creek channel.

Additional implementation of the measures in the Spill Prevention and Response Plan and the Erosion and Sediment Control Plan would prevent any significant adverse effects to water quality in the Project Area.

### **d. Contaminant Determinations** (consider items in Section 230.11(d))

Contamination of surface water and/or channel soils could result from construction activities within Unionhouse Creek. Spills of oil, grease, fuels, hydraulic fluids, or related pollutants could occur during vehicle refueling, parking, and maintenance. Improper handling, storage, or disposal of fuels and materials or improper cleaning of machinery close to or within Unionhouse Creek

could cause surface water quality degradation if these fuels are washed into the creek. Because the construction work would take place during low-flow summer months with very little precipitation, it is less likely that construction activities in Unionhouse Creek would affect downstream waterways.

**e. Aquatic Ecosystem and Organism Determinations** (use evaluation and testing procedures in Subpart G, as appropriate)

Overall adverse effects on plankton, benthos, nekton, and the aquatic food web in the creek would be short-term and temporary. Construction activities may cause a minor decrease in population of these biota within the creek system due to increased turbidity levels downstream and loss from dredging/excavation of the channel beds. After construction populations of these organisms may decrease in the creek due to a loss of vegetation along the channel since this would reduce cover, increase local water temperature, and reduce input of organic material.

**(5) Effects on Special Aquatic Sites** (discuss only those found in project area or disposal site)

Unionhouse Creek is a channelized flood control drainage with a concrete lined low flow channel in the study area. The Unionhouse Creek channel is designated as waters of the U.S. Limited vegetation is associated with the channel and includes species such as water primrose (*Ludwigia* sp.), sedge (*Cyperus* sp.), and dock (*Rumex* sp.). Vegetation is cleared from the channel on an annual basis to improve water flow, however large patches of water primrose were observed in the bottom of the channel during a site visit on June 26, 2008 (**Plate 6**; photo 6 in the EA/IS) indicating that vegetative cover does exist in the channel during the summer. The banks of the channel are earthen and vegetated with ruderal species typical of disturbed habitats. Approximately 1.60 acres of perennial drainage habitat occurs in the study area (**Plates 5a** and **5b** in the EA/IS). The perennial drainage habitat is the 12 foot wide concrete lined low flow channel of Unionhouse Creek. Under these design refinements, with the construction of a concrete rectangular channel, there will be no opportunity for this vegetation to re-grow in the channel.

Four seasonal wetlands occur outside of the study area but within 250 feet (**Plate 5a** in the EA/IS). One of these wetlands, referred to as Wetland A, was mapped as a jurisdictional waters of the U.S. in a delineation prepared by USFWS in 2005. The other three wetlands (B, C, and D) have not been delineated by the USFWS and a jurisdictional determination has not been made for these wetlands. However, these wetlands are likely jurisdictional because they have a hydrologic connection to Wetland A.

Wetland A occurs adjacent to the south bank of Unionhouse Creek downstream of Franklin Boulevard. Wetland A is in a low point in the topography and appears to be fed by sheet flow from the surrounding uplands as well as three excavated wetland swales (Wetlands B, C, and D) that carry road runoff from Franklin Boulevard. Wetland A contained several inches of water during all biological surveys of the study area. Plant species observed in Wetland A at the time of the survey included curly dock, Italian ryegrass, fireweed (*Epilobium* sp.), and loosestrife (*Lythrum hyssopifolia*). Wetland B, which is vegetated primarily with Italian ryegrass, was dry at the time of the survey. Wetlands C and D, which are connected to each other via a culvert under an access road, are mostly unvegetated and were also dry at the time of the survey.

Construction of Unionhouse Creek channel upgrades would occur within 250 feet of potentially occupied vernal pool branchiopods' habitat, which could potentially result in direct and indirect impacts. Construction activity within 250 feet of potential habitat could potentially impact these species through hydrologic disruption or decreased water quality of the seasonal wetlands.

Construction of the Unionhouse Creek channel upgrades could potentially result in direct and indirect affects to California tiger salamander. California tiger salamander is not known to occur in the study area, but USFWS protocol surveys have not been conducted for this species. The seasonal wetlands within 250 feet of the impact area may provide potential breeding habitat for this species and the annual grassland may provide potential upland habitat. California tiger salamander could potentially occur in the study area and direct effects could potentially result from the project such as physical harm to individual salamanders during site preparation and construction activities. Indirect effects of the project could potentially include hydrologic disruption or decreased water quality of the seasonal wetlands, physical vibration of aestivation habitat, and an increase in site disturbance during operation of equipment and trucks during construction activities. These site disturbances could cause salamanders to leave their burrows exposing them to increased chances of predation or other physical harm.

There are no designated sanctuaries or refuges within the project area. The proposed design refinements would have no effect on mud flats, vegetated shallows, coral reefs, riffle and pools complexes as they are not present in Unionhouse Creek which is an urbanized and channelized creek bed.

#### (6) Threatened and Endangered Species (refer to Section 230.30)

The following species have the potential to be affected by the proposed design refinements of Unionhouse Creek: giant garter snake (*Thamnophis gigas*), Swainson's hawk (*Buteo swainsoni*), burrowing owl (*Athene cunicularia*), Cooper's hawk (*Accipiter cooperii*), Pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), Sanford's arrowhead, California tiger salamander (*Ambystoma californiense*), white-tailed kite (*Elanus leucurus*), and Midvalley fairy shrimp (*Branchinecta mesovallensis*).

#### (7) Other Wildlife (refer to Section 230.32)

Some wildlife species that are tolerant of high levels of human disturbance utilize Unionhouse Creek for foraging and cover. Several bird species were observed in this habitat including black phoebe (*Sayornis nigricans*), yellow-billed magpie (*Pica nuttallii*), western kingbird (*Tyrannus verticalis*), house sparrow (*Passer domesticus*), and mourning dove (*Zenaida macroura*). Small mammals, such as voles (*Microtus* spp.), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*) and some reptiles, such as northwestern fence lizard (*Sceloporus occidentalis*) and common garter snake (*Thamnophis sirtalis*), are expected to live in or use Unionhouse Creek for a dispersal corridor.

#### (8) Actions to Minimize Effects (refer to Subpart H)

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. Because construction would occur within 250 feet of potentially occupied habitat for these species, consultation with USFWS has been initiated to determine appropriate mitigation measures for any potential direct and indirect impacts to these species that could occur as a result of the proposed project (Appendix E). Mitigation measures may include, but are not limited to; (1) implementing BMPs and adherence to all project permit requirements to prevent water quality impacts to the seasonal wetland; (2) preservation of seasonal wetland habitat for habitat affected at a ratio of 2:1 at a USFWS approved location, and, (3) other appropriate mitigation as determined by USFWS.

Midvalley Fairy Shrimp. The proposed mitigation for vernal pool fairy shrimp and vernal pool tadpole shrimp would minimize effects on midvalley fairy shrimp.

California Tiger Salamander. Mitigation measures proposed for vernal pool fairy shrimp and vernal pool tadpole shrimp are expected to reduce the potential effects on California tiger salamander to less than significant. Prior to construction, the habitat suitability of the study area and adjacent wetlands would be determined in consultation with USFWS. If suitable habitat for California tiger salamander is determined to be present, the Corps would consult with USFWS to determine if additional mitigation measures are needed above those stated above for vernal pool branchiopods. Additional measures may include, but are not limited to: (1) biological monitoring during initial construction activities in suitable habitat for this species; (2) worker awareness training to inform construction personnel of the potential occurrence of California tiger salamander; and, (3) proper procedures for protecting the species if it is observed during construction.

Giant Garter Snake. Potential aquatic dispersal habitat for the giant garter snake would be temporarily disturbed during excavation of the existing low flow channel and dewatering of the study area. Potential giant garter snake upland bank habitat in the project area would be permanently lost due to concrete lining of the channel banks. The area of the giant garter snake habitat temporarily affected is 1.60 acres of aquatic habitat consisting of the existing concrete lined low flow channel. The area of the giant garter snake habitat permanently lost is 7.62 acres of marginal upland habitat consisting of the existing vegetated banks of Unionhouse Creek. Revegetation of 2.0 acres of habitat along the north bank of Unionhouse Creek for construction of the vegetated swale would not benefit the giant garter snake because it is on the top of bank outside of the rectangular concrete lined channel. The banks of the channel are vertical and range from 17 to 20 feet in height. Giant garter snake individuals potentially dispersing through the creek would not be able to climb out of the channel in the study area and access the revegetated area for basking or refugia. Therefore, all existing bank habitat along Unionhouse Creek that would be impacted due to the construction of the proposed project is considered a permanent loss of giant garter snake upland habitat.

The Corps has re-initiated consultation with USFWS under Section 7 of the Endangered Species Act (Appendix E). The following mitigation measures included in the 2004 SEIR would be implemented. The Corps and the non-federal sponsor will ensure implementation of the respective terms and conditions and reasonable and prudent measures identified in the resulting Biological Opinion once it is received. Construction in aquatic habitat or upland habitat within 200 feet of Unionhouse Creek will conform to the USFWS's *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat*, including the requirement that construction be limited to the period between May 1 and October 1, the active period for the snake. Additional measures such as worker awareness training and biological monitoring for GGS during construction and habitat protection would be implemented as determined appropriate by USFWS. The Corps has proposed to USFWS to also compensate for the permanent loss of 7.62 acres of potential upland giant garter snake habitat through the purchase of credits at a USFWS approved mitigation bank at a 3:1 ratio.

Pallid bat and Townsend's big-eared bat. Preconstruction bat surveys would be conducted to inspect the undersides of the Franklin Boulevard and Center Parkway bridges for roosting bats. If no roosting bats are found, no further mitigation would be necessary. If bats are detected within the roost at the time of construction, excluding any bats from roosts would be accomplished by a bat specialist prior to the onset of any construction activities. Exclusionary devices, such as plastic sheeting, plastic or wire mesh, can be used to allow for bats to exit but not re-enter any occupied roosts. Expanding foam and plywood sheets can be used to prevent bats from entering unoccupied roosts.

Swainson's Hawk, Burrowing Owl, Cooper's Hawk, White-tailed Kite, and other Raptors. If construction is scheduled to occur between March 15 and September 15, preconstruction surveys would be conducted in suitable nesting habitat within 0.5 miles of the study area for Swainson's hawk, within 1,000 feet of the study area for tree nesting raptors including Cooper's hawk and white-tailed kite, and within 500 feet of the project site for burrowing owls.

Surveys shall conform to the Swainson's Hawk Technical Advisory Committee Guidelines and CDFG burrowing owl recommendations, where feasible. Burrowing owl surveys shall be conducted in both the breeding (April 15 to July 17) and non-breeding (December 1 to January 31) seasons. If nesting raptors are recorded within their respective buffers, CDFG would be consulted regarding suitable measures to avoid impacting breeding effort. Mitigation measures would include but are not limited to the following:

Maintaining a 500 foot buffer around each active raptor nest; no construction activities will be allowed within this buffer except as allowed through consultation with CDFG. The buffer may be reduced in consultation with CDFG.

Depending on conditions specific to each nest, and the relative location and rate of construction activities, it may be feasible for construction to occur as planned within the buffer without impacting breeding effort. In this case as determined by consultation with CDFG, the nest(s) shall be monitored by a qualified biologist during construction within the buffer. If the monitoring biologist determines that construction will impact the nest, the biologist shall immediately inform the construction manager and CDFG. Construction activities within the buffer will be stopped until either the nest is no longer active or the project receives approval to continue by CDFG.

Swallows, Black Phoebe, and Other Migratory Birds. If construction is scheduled to occur during the typical nesting season for these birds, March 1 through September 1, a preconstruction survey would need to be conducted within two weeks prior to construction for nesting birds under the project bridges and in other suitable habitats. If no nests are detected, no further mitigation would be necessary. If active nests are detected, CDFG would need to be contacted to determine appropriate mitigation measures to prevent impacts to nesting birds.

Alternatively, in order to prevent swallows and black phoebes from nesting under the bridge, a nest survey should be conducted prior to the nesting season in the year that construction is scheduled to commence. In consultation with CDFG, the existing unoccupied nests under the bridge should be removed prior to the nesting season by pressure washer or mechanical means. Nests can only be removed in consultation with CDFG and prior to eggs being laid in the nests. Nest exclusion should be conducted throughout the nesting season consisting of either removing partially built nests weekly through the nesting season or installing exclusionary netting for as long as necessary to prevent swallows from attempting to rebuild the nests.

Sanford's Arrowhead. Pre-construction surveys would be conducted in Unionhouse Creek prior to construction. If Sanford's arrowhead is not found, then no further mitigation would be necessary. If Sanford's arrowhead is found in the study area, appropriate mitigation would be worked out with CDFG to avoid impacts to this species. Mitigation could include transplanting any Sanford's arrowhead plants found in the study area to suitable habitats up or downstream.

## **f. Proposed Disposal Site Determinations**

### **(1) Mixing Zone Determination (consider factors in Section 230.11(f)(2))**

There will be no discharge from the dredge disposal sites; therefore a mixing zone will not be created.

### **(2) Determination of Compliance with Applicable Water Quality Standards (present the standards and rationale for compliance or non-compliance with each standard)**

Water quality standards consist of beneficial uses and Water Quality Objectives, as defined in The California Regional Water Quality Control Board-Central Valley Region: Sacramento River and San Joaquin River Basins Water Quality Control Plan (Basin Plan). The Basin Plan lists (designates) beneficial uses applicable to major waterways located within the Central Valley. Not every surface water body is listed in the Basin Plan; therefore, not every surface water body within the basin has designated beneficial uses. The Basin Plan states, “The beneficial uses of any specifically identified water body generally apply to its tributary streams.” To establish uses in tributary streams, an evaluation would need to be conducted to determine specific beneficial uses and the Basin Plan would need to be amended to establish uses that differ from the downstream waters.

The Basin Plan does not specifically identify the Morrison Creek stream group. These waterways are, therefore, assumed to have the same beneficial uses as the waters to which they are tributary (i.e., the Sacramento River). These uses include Warm and Cold Freshwater Habitat (WARM and COLD, respectively). The water quality objectives that apply to protect WARM and COLD beneficial uses of impaired urban waterways are the narrative water quality objectives for pesticides and toxicity. The narrative pesticide objectives state, in part:

- No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses,
- Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses,
- Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies, and
- Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.

The Basin Plan’s narrative water quality objective for toxicity states, “...all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration or other methods as specified by the Regional Water Board.”

Section 303(d) of the Federal Clean Water Act requires States to: 1) identify those waters not attaining water quality standards (referred to as the “303(d) list”); 2) set priorities for addressing the identified pollution problems; and 3) establish a “Total Maximum Daily Load” (TMDL) for each identified water body and pollutant to attain water quality standards. The State is required to incorporate TMDLs into the State Water Quality Management Plan. The Basin Plan, and other applicable statewide plans, serve as the State Water Quality Management Plan that governs impaired watersheds in the Sacramento and San Joaquin River basins. TMDLs will be reviewed by the USEPA to determine whether all TMDL requirements are met. A TMDL represents the maximum load expressed in terms of mass per time, toxicity or other appropriate measure of a pollutant that a water body can receive and still meet water quality standards.

### (3) Potential Effects on Human Use Characteristics

The proposed actions would have no adverse effects on municipal or private water supplies; recreational or commercial fisheries; navigation; or esthetics, parks, national historic monuments or similar preserves.

### **g. Determination of Cumulative Effects on the Aquatic Ecosystem** (consider requirements in Section 230.11(g))

The proposed design refinements would not be a significant contributor to adverse effects on the aquatic ecosystem. While the project would have some short-term construction related effects, they are considered or can be mitigated to less than significant levels. The project also affords long-term benefits to the aquatic ecosystem through widening of the channels and removal of potentially contaminated soils from the system.

**h. Determination of Secondary Effects on the Aquatic Ecosystem** (consider requirements in Section 230.11(h))

No secondary effects to the aquatic ecosystem are anticipated from project construction. There would be some minor, short-term construction effects. Best management practices would be implemented to minimize these effects. After the project is constructed, creek functions should return to pre-project conditions or improve due to increased channel widths.

**III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge**

**a. Adaptation of the Section 404(b)(10) Guidelines to this Evaluation**

**b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site That Would Have Less Effect on the Aquatic Ecosystem** (briefly discuss alternatives considered that are available and practical, and state why the one selected would result in the least amount of significant effects. Reference should be made to other appropriate sections on alternatives in EA or main reports when the 404 (b)(1) Evaluation is contained in these documents.)

The proposed dredge and fill activities would comply with Section 404(b)(1) guidelines of the Clean Water Act. No significant adaptations to the Section 404(b)(1) guidelines were made for this evaluation. Other alternatives considered to alleviate damages associated with flood flow waters included detention basins, diversion channels, concrete trapezoidal channels, rectangular concrete channels, bridge replacement or removal, or slurry cutoff walls. Nonstructural measures such as flood proofing structures, flood plain evacuation, increased flood plain restrictions, or flood warning systems were also considered. These measures were eliminated from further consideration because (1) they failed to meet the project flood control goals; (2) the costs exceeded the benefits; or (3) the associated environmental effects were excessive. Redesigning the Unionhouse Creek channel from trapezoidal to rectangular is deemed to be the most appropriate measures to increase flood protection levels in this stream group because of limited land available in this highly urbanized location, less disruptive to traffic, and would be cost-effective.

- c. Compliance with Applicable State Water Quality Standards and**
- d. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act**
- e. Compliance with Endangered Species Act (ESA) of 1973**

The proposed design refinements would be in compliance with all State of California water quality standards, Section 307 of the Clean Water Act and the Endangered Species Act of 1973, as amended.

**f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972**

The proposed design refinements would not be located within a designated Marine Sanctuary.

**g. Evaluation of Extent of Degradation of the Waters of the United States**

**(1) Significant Adverse Effects on Human Health and Welfare**

The proposed design refinements would not have a significant adverse impact on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, wildlife, and special aquatic sites. The activities would have no significant adverse effect on the life stages of aquatic organisms or other wildlife. No significant adverse effects on aquatic ecosystem diversity, productivity and stability or on recreational, and economic values would occur.

**h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Effects of the Discharge on the Aquatic Ecosystem**

Steps taken to minimize potential adverse effects on the aquatic ecosystem include timing of disposal activities, use of best management practices during construction, and diversion of creek flows during construction.

**i. On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Fill Material Complies with the Requirements of these Guidelines.**

On the basis of the guidelines, the proposed design refinements for Unionhouse Creek is specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

## **Appendix H**

### **State Historic Preservation Officer Correspondence Letter**

**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 16, 2008

In Reply Refer To: COE970429A

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

Re: South Sacramento Streams Flood Improvements Project, Sacramento County, California.

Dear Mr. Piccola:

Thank you for continuing consultation with me, with your letter of July 9, 2008, and supporting documentation, regarding the South Sacramento Streams Flood Improvements Project. The U.S. Army Corps of Engineers (COE), Sacramento District, is seeking my concurrence on the effects that the proposed additional refinements to this 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 the upgrading of the channel of Unionhouse Creek for a distance of 5.520 linear feet, from a location approximately 200 feet downstream of Franklin Boulevard to a point 200 feet upstream of Center Parkway. This project was the subject of an earlier consultation in 2004, resulting in my concurrence at that time regarding the COE's finding of No Historic Properties Affected. The COE is now continuing consultation due to project refinements, actions which the COE has identified as an undertaking subject to review under Section 106 of the NHPA. After reviewing your letter and attachments, I have no objection to your proposed finding of No Historic Properties Affected.

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](mailto:wsoule@parks.ca.gov).

Sincerely,

*Susan K. Shattuck for*

Milford Wayne Donaldson, FAIA  
State Historic Preservation Officer