Feather River West Levee Project

Final 408 Permission Environmental Impact Statement

June 2013

US Army Corps
of Engineers ®
Sacramento District

FINAL

FEATHER RIVER WEST LEVEE PROJECT
408 PERMISSION
ENVIRONMENTAL IMPACT STATEMENT

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June 2013

ICF International. 2013. *Feather River West Levee Project 408 Permission Environmental Impact Statement*. Final. June. (ICF 00852.10.) Sacramento, CA. Prepared for U.S. Army Corp of Engineers, Sacramento, CA.

Approach to the Final EIS ~~and Executive Summary~~

~~Approach to the Final EIS~~Overview of Comments

The Feather River West Levee Project (FRWLP, or project) Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was circulated for public review in December 2012, with a public comment period of 49 days, between December 27, 2012, and February 13, 2013. Thirty-one comments were submitted on the Draft EIS/EIR, including those from:

- three federal agencies,
- one tribal government,
- three state agencies,
- twelve individuals (via written comment),
- twenty-one individuals (audible oral comments recorded at three public hearings), and
- three non-governmental organizations (NGOs), tribal or other organizations.

The majority of comments received were related to one or more of the following topic areas.

- concern regarding U.S. Army Corps of Engineers (USACE) levee vegetation policy as it relates to the FRWLP,
- concern regarding the adequate analysis of recreation impacts,
- questions and comments on the analysis of wildlife and vegetation resources,
- questions and comments on public access issues,
- questions and comments on hydraulic capacity concerns,
- questions and comments on property acquisition,
- questions and comments on the analysis of alternatives presented,
- questions and comments on the analysis of growth inducing impacts, and
- other miscellaneous comments.

~~Chapters 1 through 4 present the full comments and detailed responses, organized by public agencies; NGOs, tribal or other organizations; individuals; and public hearings. Each comment in the following chapters has been considered and responded to individually.~~

Overview of Changes to the Final EIS

As introduced above, this document is presented in two parts:

- Part I is the introduction, alternatives descriptions, discussion of the affected environment, discussion of the environmental effects, and supporting information from the Draft EIS/EIR, revised, with revisions showing strikeouts for deletions and underline for insertions, based on comments received; and other necessary updates and corrections.
- Part II is the record of comments received and responses. Chapters 1 through 4 present the full comments and detailed responses, organized by public agencies or tribal governments; NGOs, or other organizations; individuals; and public hearings. Each comment ~~in the following chapters~~ has been considered and responded to individually.

Changes to the Document

This EIS/EIR was initiated as a joint document with USACE involvement pursuant to its authority under 33 U.S.C. Section 408 and as the lead National Environmental Policy Act (NEPA) agency, and with the Sutter Butte Flood Control Agency (SBFCA) as the project applicant and the California Environmental Quality Act (CEQA) lead agency. The Draft EIS/EIR was written with joint NEPA and CEQA language to characterize the cooperation of the two agencies on the FRWLP. Since the release of the Draft EIS/EIR, the NEPA and CEQA processes have been separated and are now represented by a stand-alone EIS and a stand-alone EIR, respectively. It should be noted that the language in this EIS has not been modified to NEPA-only; it maintains the joint language used when environmental analysis was initiated on the FRWLP.

Additionally, the Draft EIS/EIR included a General Conformity Determination in Appendix D due to emissions associated with Alternative 2 that are in excess of the General Conformity *de minimis* thresholds, per the Clean Air Act. However, USACE and SBFCA have determined that Alternative 2 is not the preferred alternative and emissions associated with Alternative 3, the applicant-preferred alternative (APA), are below the applicable General Conformity *de minimis* thresholds. Therefore, the General Conformity Determination previously presented in the Draft EIS/EIR has been removed and is not included in the FEIS.

ES.1 Introduction

~~The Sutter Butte Flood Control Agency (~~SBFCA~~)~~ is proposing the ~~Feather River West Levee Project (~~FRWLP~~, or project)~~ to reduce flood risk in the Sutter Basin, which includes portions of Sutter and Butte Counties in the Sacramento Valley of California. SBFCA was formed as a joint powers authority in 2007 through a joint exercise of powers agreement by the Counties of Sutter and Butte; the Cities of Yuba City, Gridley, Live Oak, and Biggs; and Levee Districts 1 and 9 (LD 1, LD 9).

In partnership with the State of California (through the California Department of Water Resources [DWR] and Central Valley Flood Protection Board [CVFPB]), SBFCA embarked on a comprehensive evaluation of the condition of the levees protecting the area in 2007, the results of which are also being used by ~~the U.S. Army Corps of Engineers (~~USACE~~)~~. The evaluation was necessary to identify the magnitude and severity of deficiencies and determine measures to address the deficiencies. The results of the comprehensive evaluation revealed that substantial construction is necessary to meet current ~~flood protection~~level of performance standards.

As described in Section 1.5.2, the USACE is conducting a feasibility study (the Sutter Basin Pilot Feasibility Study (SBPFS) or Sutter Basin Feasibility Study). The FRWLP is being advanced by SBFCA to expeditiously reduce flood risk before the feasibility study is completed. USACE plans to release for public review an integrated Sutter Basin Draft Pilot Feasibility Report and Draft EIR/Draft Supplemental EIS in May 2013. For purposes of identifying the project proposed for federal authorization, and because this document (i.e., the FRWLP FEIS) analyzes a project whose reach and environmental impacts are similar to those of the SBPFS, the actions proposed in the FRWLP EIS will be supplemented to include work associated with the SBPFS, including an additional reach of levee improvements and impacts on vegetation. As such, the SBPFS EIS will supplement the analyses and conclusions reached by USACE in this Final EIS. SBFCA has certified and adopted the Final EIR for the FRWLP and filed a Notice of Determination. The scope of the CEQA effect analysis in the SBPFS EIR will incorporate by reference relevant information, analyses and conclusions of the FRWLP Final EIR. ~~As described in Section 1.5.2, the USACE is conducting a feasibility study (the Sutter Basin Pilot Feasibility Study or Sutter Basin Feasibility Study). The FRWLP is being advanced by SBFCA to expeditiously reduce flood risk before the feasibility study is completed. USACE plans to release for public review a draft integrated study report and environmental impact statement (EIS)/environmental impact report (EIR) in February2013. Because the FRWLP and the USACE study may affect the same general area, have similar purposes, and share potential measures and effects, the EIS/EIR prepared for the feasibility study is expected to incorporate by reference much of the information, analyses, and conclusions contained within this document. The EIS/EIR would supplement this EIS/EIR focusing on additional alternatives, their effects, or new information not addressed in this document.~~

To construct the FRWLP, SBFCA is requesting permission from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (Title 33 of the U.S. Government Code [USC], Section 408, [33 USC 408]), hereinafter referred to as *Section 408*, for the alteration of a levee as part of the Sacramento River Flood Control Project (SRFCP), a Federal work.

ES.1.1 Document Purpose and Structure

ES.1.1.1 Document Overview

This document is a Final ~~n~~ ~~joint~~ EIS~~/EIR~~ and is intended to satisfy the requirements of NEPA ~~and the California Environmental Quality Act (CEQA)~~ for disclosing environmental effects and recommended mitigation measures related to a proposed action (or project), and alternatives, prior to making a decision on project approval. Specifically, this document analyzes the FRWLP to support a NEPA Record of Decision (ROD) ~~and CEQA Notice of Determination (NOD)~~.

As the lead federal agency, USACE is preparing this EIS for the purposes of compliance with NEPA due to its authority over alteration to Federal project levees.

~~SBFCA is the lead agency and implementing agency preparing this EIR for the purposes of compliance with CEQA.~~

ES.1.1.2 Application of NEPA and CEQA Principles and Terminology

For this environmental evaluation, the more rigorous of the two laws was applied in cases in which NEPA and CEQA differ. In some cases in this document, both NEPA and CEQA terminology are used, as in Chapter 1, where the project purpose and need and project objectives are discussed. The terms

environmental consequences, environmental impacts, and *environmental effects* are considered synonymous in this analysis, and *effects* is used for consistency.

Technical terms used in the EIS/EIR are typically defined in their first instance of use in the text. A list of acronyms and abbreviations precedes Chapter 1.

ES.1.1.3 Resource Analysis Structure

Chapter 3, *Affected Environment and Environmental Consequences*, contains the project-level analyses for the FRWLP, following the structure below.

- Introduction.
  - Sources of information
- Affected environment.
  - Regulatory setting
  - Environmental setting
- Environmental consequences.
  - Assessment methods
  - Determination of effects
  - Effects and mitigation measures

Table ES-1 provides a key for relating the effects findings by relative severity (increasing in degree of adversity to the environment).

Table ES-1. Key to Effect Findings (by Increasing Adversity)

Finding
Beneficial
No Effect
Less than Significant
Significant
Significant and Unavoidable

ES.1.2 Setting and Study Area

The regional setting of the FRWLP is the Sacramento River Flood Control Project (SRFCP), beginning as far north as Redding, California, and extending south to the Sacramento–San Joaquin River Delta (Delta) (Plate 1-1). The regional setting is important relative to other flood risk reduction projects occurring within the SRFCP (Plate 1-2). These and other projects are described under Section 1.5, *Related Actions, Programs, and Planning Efforts*. For the analysis of effects (direct, indirect, or cumulative), the regional context of the SRFCP is taken into consideration.

Scoping down in regional setting, the Sutter Basin is part of the SRFCP, located in north-central California in Sutter and Butte Counties. The elongated, irregularly shaped basin covers about 326 square miles and is about 44 miles long north to south and up to 14 miles wide east to west. It is roughly bounded by the Feather River (to the east), Cherokee Canal, the Sutter Buttes, and Sutter Bypass (to the west, listed from north to south). Floodwaters potentially threatening the basin originate from the Feather River watershed or the upper Sacramento River watershed, above Colusa Weir. These waterways have drainage areas of 5,921 and 12,090 square miles, respectively. In addition to Yuba City, communities in the basin include Biggs, Gridley, Live Oak, and Sutter.

The project area for the FRWLP, a subset of the Sutter Basin described above, is focused on the corridor along the west levee of the Feather River from Thermalito Afterbay on the north to approximately 4 miles north of the Sutter Bypass on the south. This corridor is roughly 500 feet toward the land side of the existing levees and 100 feet toward the water side. This corridor was determined as the area in which levee improvements, such as seepage berms, stability berms, relief wells, setback levees, erosion protection, and slurry cutoff walls, are likely to occur. The corridor is approximately 41 miles long, divided into 41 relatively homogeneous reaches for ease of describing existing conditions, proposed actions, the affected environment, and potential environmental effects (note that this number is coincidental and one reach does not consistently correspond to a length of 1 mile; additionally, Reach 1 is not a part of the FRWLP), shown on Plates 1-3a and 1-3b. The project area would also include borrow/spoil sites or project mitigation sites outside of this corridor, as further described in Chapter 2, *Alternatives*. The reaches are listed in Table 1-3. Plates 1-4 through 1-10 show representative photos of the project area.

For the purposes of this document, the *study area* and *planning area* are considered the same, defined as the area within SBFCA's planning authority in which potential actions would occur and where environmental effects are likely to occur. The *project area* is defined as the area in which potential actions (i.e., alternatives) would occur. The *affected area* is defined as the location of resources that would be directly, indirectly, or cumulatively affected by the project alternatives.

ES.1.3 Project Background

ES.1.3.1 Flood Management History

Prior to European settlement in the mid-19th century, the floodplain of the Sacramento River in the 150 miles between the city of Redding and the Delta varied from 2 to 30 miles wide and annually covered more than 1 million acres. Low, discontinuous levees were built by individual landowners from the 1840s to the 1890s. Those levees concentrated floodflows and contributed to problems that were worsened by upstream hydraulic mining in the Sierra Nevada foothills in the late 1800s.

The SRFCP was authorized by Congress in 1917 as the first Federal ~~flood control~~flood risk management project outside the Mississippi River Valley and was the major project for ~~flood control~~flood risk management on the Sacramento River and its tributaries. The non-Federal sponsor was the Reclamation Board of the State of California (Reclamation Board, reauthorized in 2007 as the CVFPB). With the authorization of the SRFCP, USACE and the State of California began managing the project as a regional system, constructing improvements to approximately 1,100 miles of levees and creating bypasses and floodways. Additional information is provided in Section 3.1, *Flood ~~Control~~ Risk Management and Geomorph~~ology~~ic Conditions*.

Although the ~~flood control~~flood risk management structures have been extensively improved and upgraded since construction, the underlying foundation of most of the levees and channels pre-dates any state or USACE involvement and still retains the original materials that include dredged riverbed sands, soil, and organic matter. At the time of the SRFCP authorization in 1917, the areas being protected by the levees were primarily agricultural with minimal improved infrastructure such as railroads and highways. Today, the area remains largely agricultural with population centers including Yuba City, Biggs, Gridley, Live Oak, and Sutter.

The Federal government maintains oversight but has no ownership of or direct responsibilities for performing maintenance of the Federal levee system, except for few select features that continue to be owned and operated by USACE. Considering these exceptions, the great majority of levees, channels, and related ~~flood control~~flood risk management structures are owned, operated, and maintained by the State of California and local levee and reclamation districts as governed by USACE operations and maintenance (O&M) manuals. Most of the levee and reclamation districts existed prior to the SRFCP authorization in 1917 and have been carrying out maintenance responsibilities. Today, many of the levee districts are substantially underfunded and unable to maintain the system to meet current Federal standards. The levees in the planning area are maintained by LD 9; DWR's Maintenance Areas (MAs) 3, 7, and 16; and LD 1. MA 3 is responsible for the lowermost reaches of the project area, followed by LD 1, LD 9, MA 16, and MA 7 from south to north.

In addition to the SRFCP levee system, two major flood management reservoirs are located within the Feather River watershed. Oroville Dam and reservoir (Lake Oroville) were constructed on the Feather River in 1967 as an element of the California State Water Project. The reservoir has 3,358,000 acre-feet of storage with 750,000 acre-feet of dedicated flood management space. New Bullards Bar Dam and reservoir were constructed on the Yuba River in 1970 by the Yuba County Water Agency. The reservoir has 966,000 acre-feet of storage with 170,000 acre-feet of dedicated flood management space.

A notable milestone in improving the local levee system was construction of a 3,000-foot setback levee at Star Bend on the Feather River West Levee in 2009. Located about 10 miles south of Yuba City and north of the Sutter Bypass confluence, this project is within the FRWLP project area and the proposed FRWLP activities would adjoin the new setback levee upstream and downstream. LD 1 is the local maintaining agency and was the project proponent and owner, with major funding from the State of California through Propositions 1E and 84, as well as LD 1, Calpine Corporation, Sutter County, and the City of Yuba City. The new levee was built to current standards and included a slurry cutoff wall for under-seepage protection. The old levee was degraded and the new expanded floodplain is an ecosystem restoration site, with surplus area available intended to provide for habitat mitigation for the FRWLP.

Major flood events occurred along the Feather River in 1955, 1958, 1964, 1986, 1997, and 1998. Of these, the more significant events that caused levee failures and flooding of the Sutter Basin and surrounding areas were in 1955, 1986, and 1997. In December of 1955, the most significant flood event along the Feather River is reported to have occurred. Several levee embankment failures caused major flooding of nearly all of Yuba City as well as flooding in Nicolaus. Approximately 156 square miles were flooded during this event. In February of 1986, heavy snow pack and warm rains elevated water levels and caused a levee embankment failure on the adjacent segment of the Yuba River near Linda, flooding nearly 30 square miles including Linda and Olivehurst, causing a fatality and an estimated $20 million in damages (1986 dollars). Over the new-year transition from 1996 to 1997, heavy snow pack and warm rains again elevated water levels. All citizens in Yuba City, Marysville, Linda, and Olivehurst were ordered to evacuate. Ultimately, in January of 1997, a levee embankment failure occurred south of Olivehurst flooding nearly 50 square miles including Olivehurst and Arboga, causing four fatalities and an estimated $41 million in damages (1997 dollars) (HDR et al. 2011).

Over that past two decades, several studies have been conducted by USACE, DWR, or SBFCA to evaluate the condition of the levees protecting the planning area relative to criteria for stability, seepage, erosion, geometry, and levee height. These studies have indicated that the levee system is deficient and that the consequences of levee failure from a major flood event would be significant (described under the No Action Alternative in Chapter 2). Specifically, as a result of knowledge gained from its regional comprehensive study (the Sacramento–San Joaquin River Basins Comprehensive Study, also known as the Comp Study) initiated after the 1997 flood, USACE revised its levee criteria regarding through-seepage and under-seepage, problems known to exist within the SBFCA levee system (U.S. Army Corps of Engineers and the Reclamation Board for the State of California 2002).

Further evaluation has demonstrated that much of the existing system does not provide protection from the 100-year flood event, the commonly accepted minimum ~~level of flood protection~~level of performance per the Federal Emergency Management Agency's (FEMA's) National Flood Insurance Program (NFIP), as well as being less than the 200-year level targeted by the State of California for urban areas. In addition, an emergency preparedness mapping study analyzed hypothetical levee failures and determined the rate and depth at which water would flood SBFCA's planning area if a levee failure occurred in the studied reaches; this study predicted flooding depths that could range from about 1 foot to more than 20 feet in some areas.

According to records from the local maintaining agencies (MAs and LDs) compiled by the SBFCA engineering team, there have been more than 125 observed levee performance problem locations in the project area since 1955. These problems include seepage, erosion, boils, breaks, and cracks. This accounting includes the catastrophic floods of 1955, 1986, and 1997.

ES.1.3.2 Overview of Levee Failure Mechanisms and Deficiencies

As discussed above, USACE, DWR, and SBFCA have commissioned studies to determine the type, location, and severity of deficiencies in the SBFCA flood management system. In simple terms, floods typically occur from levee failure mechanisms and deficiencies such as when one of the following events occurs.

- Water moves through the levee structure (through-seepage).
- Water moves under the levee structure (under-seepage).

- Levee slopes are overly steepened or levees have inadequate section to resist floodwaters or other forces (slope stability and geometry).
- Water carries soil away from the levee slope (erosion).
- Vegetation and other encroachments, such as structures, impede levee O&M (non-compliant vegetation and levee encroachments).

Table ES-2 shows deficiencies by reach. Plate 1-11 illustrates levee seepage and Plate 1-12 illustrates other typical deficiencies.

Table ES-2. Summary of Levee Deficiencies by Reach

Study Reach	Through-Seepage[a]	Under-Seepage[b]	Slope Stability[c]	Erosion	Encroachments
1	Not part of the project proposed at this time.				
2	X	X	*		X
3	X	X	*		X
4	X	X	*		X
5	X	X	*		X
6					
7	X	X	*		X
8	X	X	*		X
9	X	X	*		X
10	X	X	*		
11	X	X	*		X
12					
13	X	X	*		
14					
15	X	X	*		X
16			X	X	X
17	X	X	*		X
18	X	X	*		X
19	X	X	*		X
20		X	*		X
21		X	*		X
22	X	X	*		X
23		X	*		X
24		X	*		X
25					
26	X	X	*		X
27	X	X	*		X
28		X	X		X
29					
30	X	X	*		X
31		X	X		X
32	X	X	*		X
33	X	X	*		X
34	X	X	*		X
35	X	X	*		X
36	X	X	*		X

Study Reach	Through-Seepage[a]	Under-Seepage[b]	Slope Stability[c]	Erosion	Encroachments
37	X	X	*		X
38	X	X	*		X
39					
40	X	X	*		X
41	X	X	*		X

Source: PFR August 2011.
Notes: An X signifies the levee deficiency applies to the levee reach.
[a] Through-seepage issues based on phreatic surface existing on the landside slope.
[b] Under-seepage issues based on exit gradient greater than 0.5 at the landside levee toe.
[c] An * signifies areas where through- and under-seepage issues exist and slope stability was not independently verified.

ES.1.3.3 Formation of SBFCA and Development of the FRWLP

Currently, there are several major flood risk-reduction projects being planned or implemented within the SRFCP area (Plate 1-2), discussed in further detail under Section 1.5, *Related Actions, Programs, and Planning Efforts*.

SBFCA was formed in 2007 to take a proactive rather than reactive stance with respect to flood risk reduction specific to the Sutter Basin area. At that time, FEMA was revising its Flood Insurance Rate Maps (FIRMs) in the study area through a nationwide program entitled RiskMAP (mapping, assessment, and planning) that would likely lead to the study area being mapped within the 100-year floodplain. This would make flood insurance mandatory for all Federally guaranteed loans and restrict development. SBFCA concluded that it was necessary to perform a comprehensive evaluation of the Feather River West Levee to determine the current ~~level of flood protection~~level of performance based on current engineering criteria, determine the magnitude and severity of any deficiencies, and develop recommended strategies for improvement.

As introduced previously, specific levee deficiencies along the Feather River West Levee are through-seepage, under-seepage, erosion, levee instability, and encroachments. There are also improvement needs for long-term O&M of the flood management corridor. The FRWLP as proposed by SBFCA will address these deficiencies and needs for that portion of the perimeter of the planning area to assist in incrementally reducing local flood risk.

In July 2010, SBFCA formed an assessment district to raise local funds for levee improvements and repairs from property owners. The majority of funding to improve the levees will be obtained through state and local assistance; Federal crediting is being pursued. The property owners recognized the flood risks and indicated their willingness to participate in improvements by voting to approve an annual parcel assessment in 2010. This funding source facilitated SBFCA's advancement of the FRWLP.

ES.1.4 Project Purpose, Objectives, and Need

ES.1.4.1 Project Purpose

SBFCA's goal is to achieve a minimum of 200-year ~~flood protection~~level of performance for the more urbanized areas with population centers and 100-year ~~flood protection~~level of performance for the remaining more rural agricultural parts of the planning area. A 200-year flood is a flood that has a

0.5% chance of occurring in any given year, also referred to as a 0.5% annual exceedance probability (AEP). A 100-year flood has a 1% AEP. The target of 100-year protection for the more rural, agriculture parts of the planning area, specifically the southern portion of the basin downstream of Yuba City, is driven by the goal to maintain viability and sustainability of agriculture by avoiding FEMA restrictions that would hinder construction or upgrade of agricultural infrastructure (such as farm residences, barns, silos, dryers, seasonal worker housing) and supporting business.

The primary purpose of the FRWLP is to reduce flood risk for the entire planning area by addressing known levee deficiencies along the Feather River West Levee from Thermalito Afterbay downstream to approximately 4 miles upstream of the confluence with the Sutter Bypass. While the FRWLP would not by itself reduce all flood risks affecting the planning area, it would address the most immediate risk based on the following.

- The proximity of the Feather River to population centers and key infrastructure.
- The nature of Feather River West Levee being the longest and most contiguous portion of the planning area perimeter.
- The location of known levee deficiencies and the clarity and feasibility of available measures to address them.

Future ~~phases~~ projects may be implemented by SBFCA in coordination with the State of California and USACE based on available funding, the outcome of the Sutter Basin Feasibility Study, and implementation of the Central Valley Flood Protection Plan (CVFPP) and other flood management programs (or multi-objective programs that include flood management).

ES.1.4.2 Project Objectives

The following objectives provide additional detail in support of the project purpose above.

- Protect existing populations and minimize exposure to flooding for agricultural commodities, infrastructure use, and other property.
- Reduce flood risk from Feather River toward a target of 200-year protection for Yuba City and to the north of the planning area and 100-year protection south of Yuba City, in compliance with Senate Bill (SB) 5 mandates for 200-year protection for urbanized areas and in avoidance of FEMA restrictions that would compromise agricultural sustainability.
- Address known deficiencies and observed performance issues.
- Construct a project as soon as possible to reduce flood risk as quickly as possible.
- Construct a project that is economically, environmentally, politically, and socially acceptable.
- Facilitate compatibility with the CVFPP and Sutter Basin Feasibility Study such that proposed activities would be “no regrets” and not inconsistent with any future plans.
- Facilitate compatibility with recreation and restoration goals in the planning area and incorporate multiple benefits in addition to flood-risk reduction, such as fish and wildlife habitat and recreation.

In regard to this last objective, SBFCA has identified several multi-benefit floodplain actions targeted at floodplain habitat restoration in combination with flood management. These actions are not part of the project analyzed in this EIS/EIR and would require separate analysis. SBFCA seeks to partner with other public agencies and environmental organizations to implement these actions.

ES.1.4.3 Need for Action

Four needs have been identified for action.

- Study results from levee evaluations have shown that the Feather River West Levee needs improvements to reduce the current level of risk to human health, safety, property, and the adverse economic effect that serious flooding would cause.
- Study results have further shown that the levees in SBFCA's planning area, and, specifically, that on the west of the Feather River, are deficient when compared against current Federal and state standards.
- Improvements are necessary to meet FEMA's minimum acceptable level of ~~flood protection~~ performance (commonly referred to as the 100-year flood) as specified by the NFIP. Draft revised FEMA maps show that all or parts of SBFCA's planning area may not meet 100-year flood standards. SBFCA intends to incrementally reduce risk to meet or exceed the FEMA standards.
- As mandated by SB 5, the CVFPB will require a 200-year level of ~~flood protection~~performance for urban areas by the year 2025 and calls for building and development limitations after 2015 if adequate progress towards achieving this standard is not met. Improvements to the Feather River West Levee are necessary to meet that requirement.

To further demonstrate the need for action, details about flood risk in SBFCA's planning area and the consequences of levee failure are described in Chapter 2, *Alternatives*. Additional context for the objectives of, purpose of, and need for the FRWLP can be found in Chapter 1.

ES.1.5 Related Actions, Programs, and Planning Efforts

This section lists other flood management activities that comprise the regional planning context for the FRWLRP.

- System-wide efforts.
  - Central Valley Flood Protection Act (including Sutter Bypass Expansion and Fish Passage Improvements
  - Sacramento River Flood Control System Evaluation
  - Sacramento–San Joaquin River Basins Comprehensive Study and Central Valley Integrated Flood Management Study
  - Sacramento River Bank Protection Project
  - Flood Control and Coastal Storm Emergency Act
- Federal projects within the region.
  - Sutter Basin Feasibility Study
  - Yuba Basin Project
  - American River Common Features Project
  - West Sacramento General Reevaluation Report
- State and local projects within the region.

- Lower Feather River Corridor Management Program
- Three Rivers Levee Improvement Program
- Natomas Levee Improvements Program
- West Sacramento Levee Improvements Program

ES.1.6 Community Outreach, Agency Coordination, and Issues of Known Controversy

ES.1.6.1 Community Outreach

USACE and SBFCA have established a proactive multi-media outreach program to affected communities, the general public, and stakeholders about the FRWLP. The approach to the outreach program has been to go beyond the guidelines and requirements of NEPA and CEQA for public noticing to ensure the affected community and other interested stakeholders are informed, engaged, and involved through an accessible, open, and transparent process. Thus far, the FRWLP outreach program has included meetings, publications, web-postings, presentations, and other community involvement activities.

The FRWLP scoping effort was conducted jointly with the Sutter Basin Feasibility Study. The two projects are related in their study area, purpose, potential measures and potential effects. Despite joint scoping, two separate EIS/EIRs are being developed for each project. A more detailed accounting of the scoping process conducted in June 2011 is provided in Appendix B.

To date, the results of the FRWLP outreach program have been favorable, constructive, and supportive. The tone and substance of the input has been consistent with the voter-approved assessment to fund the local share of the project.

ES.1.6.2 Agency Consultation and Coordination

The FRWLP has been planned in coordination and cooperation with numerous local, state, and Federal agencies. In Chapter 3, the regulatory setting for each respective resource describes the compliance with applicable Federal, state, regional, and local laws and regulations, including coordination to date with various agencies, such U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and ~~Game~~ Wildlife (~~DFG~~CDFW).

This EIS/EIR would be used by Responsible and Trustee Agencies to determine the effects of the proposed action.

ES.1.6.3 Issues of Known or Expected Controversy

NEPA requires that project proponents identify issues of known controversy that have been raised in the scoping process and throughout the development of the project. The following are potentially controversial issues.

- Construction-related effects.
- Property acquisition.
- Levee encroachments and vegetation.
- Climate change and sea-level rise.

- River access for recreation.

ES.2 Alternatives

ES.2.1 Introduction

Chapter 2 describes the following elements, which are summarized in this section.

- Action alternatives.
- Construction timing.
- Detailed measures comprising the alternatives.
- Common elements, assumptions, and environmental commitments incorporated into each action alternative.
- A no action alternative
- Alternatives screening.

ES.2.2 Action Alternatives

ES.2.2.1 Overview of Measures Carried Forward in Alternatives Development

A number of measures or combination of measures can be used to counteract levee deficiencies and reduce flood risk. Table ES-3 summarizes the deficiencies identified in the project area and potential measures that could be applied to resolve each deficiency. These measures have been combined to compose the action alternatives.

Table ES-3. Summary of Measures and Deficiencies

	Deficiency				
Measure	Through-Seepage	Under-Seepage	Slope Stability and Geometry	Erosion	Encroachments
Slurry cutoff wall	✓	✓			
Slope flattening	✓		✓		
Stability berm	✓				
Levee reconstruction	✓		✓		✓
Sheet-pile wall	✓				
Seepage berm		✓			
Relief wells		✓			
Depression/ditch infilling		✓			
Clay ditch lining		✓			
Limited encroachment removal					✓
Canal seepage treatment		✓			

ES.2.2.2 Overview of Alternatives Carried Forward

NEPA and CEQA require that an EIS or EIR (respectively) consider a range of alternatives that would attain most of the project purpose, need, and objectives while avoiding or substantially lessening project effects; a no action or no project alternative is also required. Consistent with NEPA standards, alternatives are analyzed on an equal basis and at an equal level of detail; however, because the role of USACE as the Federal lead agency is one of granting permission rather than as a sponsor or proponent of the project, SBFCA as the applicant may identify an applicant-preferred alternative.

Based on SBFCA's planning process and engineering studies, the measures listed in Table ES-3 have been combined, developed, and screened into three project alternatives for the FRWLP to be carried forward for study in the EIS/EIR (in addition to the no action alternative). The alternatives are summarized below based on their primary formulation concept, followed by a table of measures used in each alternative (Table ES-4). A detailed table of the measures proposed by reach is provided in Chapter 2 (Table 2-4). Plate 2-1 illustrates the alternatives.

- **Alternative 1.** Alternative 1 is focused on those measures that would predominantly keep within the existing footprint of the Feather River West Levee. Advantages of an alternative formulated on this basis are that it may minimize real estate acquisition and changes in land use. This alternative primarily proposes cutoff walls as a technique to address the deficiencies (along with other measures) while minimizing change in the existing levee footprint.
- **Alternative 2.** Alternative 2 includes measures that would not be constrained by the existing footprint of the Feather River West Levee. Advantages of an alternative formulated on this basis are that it may more effectively address the deficiency or may be less in cost compared to measures within the levee footprint. This alternative primarily proposes stability berms and seepage berms (along with other measures), which would substantially extend beyond the current levee footprint.
- **Alternative 3.** Alternative 3 is a blend of the flood management measures identified in Alternatives 1 and 2, optimized based on the screening criteria. Optimized means a number of factors have been considered, such as effectiveness in addressing the deficiencies, compatibility with land use, minimization of real estate acquisition, avoidance of effects, and cost; the footprint has been considered but not held as a primary constraint. This alternative proposes a combination of cutoff walls and berms (along with other measures). Alternative 3 is the ~~applicant-preferred alternative (~~APA~~)~~ and has been optimized to avoid and minimize environmental effects.

Section 2.1.4 provides detailed descriptions of proposed measures by reach for each alternative. Borrow sites are discussed in Section 2.3.5. Section 2.7.3 provides a description of screening for alternatives carried forward.

Table ES-4. Summary of Measures Used by Alternative

Measure	Alternative 1	Alternative 2	Alternative 3
Slurry cutoff wall	✓	✓	✓
Slope flattening	✓	✓	✓
Stability berm		✓	✓
Levee reconstruction	✓	✓	✓
Seepage berm	✓	✓	✓
Relief wells		✓	✓
Depression/ditch infilling	✓	✓	✓
Clay ditch lining	✓		
Limited encroachment removal	✓	✓	✓
Canal seepage treatment	✓		✓

Note: Sheet-pile walls may be used for limited, site-specific conditions in any alternative but are not planned for large-scale application for a project reach.

ES.2.2.3 Construction Timing

Specific sequencing of construction would be dynamic throughout project planning and design, subject to change based on factors including the following.

- Further engineering in determining the clarity and efficacy of site-specific measures.
- Easement and right-of-way acquisition (where necessary).
- Availability of proximate, suitable, and cost-effective borrow material.
- Environmental clearances based on wildlife presence, lifecycle activity, and location of habitats.

Based on current planning analysis, under each of the three alternatives, construction would occur in more than one annual construction season (typically April 15 to November 30, subject to conditions).

It is anticipated the construction of the FRWLP would be divided into four separate construction contracts (i.e., A, B, C and D). Although subject to change, the four contracts and their respective areas for construction of the FRWLP are identified in Table ES-5 below.

Table ES-5. Construction Contracts, FRWLP Reaches and Years for Construction

Construction Contract	FRWLP Reaches	Years for Construction
A	2–5	2014–2015
B	6–12	2014–2015
C	13–25	2013–2014
D	26–41	2014–2015

It should be noted that 2015 is the presently anticipated year for completion and is consistently used throughout the analysis as presenting the conditions that would result in the greatest severity effect magnitude and disclosure of maximum effects (e.g., for air quality, 2015 represents the most conservative basis for analysis because it is the most aggressive feasible schedule in determining

daily and annual emissions). The one exception is that 2017 is used for the consultations with USFWS and the National Marine Fisheries Service (NMFS) because the longer construction duration represents maximum effects based on habitat disturbance.

ES.2.3 No Action Alternative

ES.2.3.1 Introduction to No Action

Identification and analysis of a no action alternative is required pursuant to NEPA, and a no project alternative is required for CEQA. The purpose of the no action or no project alternative is to serve as a benchmark against which the effects of the action alternatives may be evaluated. For NEPA, no action is defined as those conditions that would result if USACE were to issue neither Section 408 permission nor permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. For CEQA, *no project* is defined as those conditions that would result if SBFCA were to not adopt and implement a project. Because the action alternatives would require Section 408 permission from USACE for SBFCA to implement a project, the NEPA no action and CEQA no project are considered to be the same and are simply referred to as the No Action Alternative for this EIS/EIR.

Under the No Action Alternative, SBFCA would not implement flood risk-reduction measures and no levee repair or strengthening would be implemented, the purpose and objectives would not be met, and the current level of flood risk would continue. Current conditions and O&M practices would be expected to occur in the foreseeable future.

Future State or Federal Action

Despite the possibility of eventual state- or Federally led implementation of repairs, for the purpose of evaluating effects under the No Action Alternative, the EIS/EIR assumes that flood risk-reduction measures would not occur. This assumption provides the most conservative approach for disclosure and comparison of potential effects. Again, as stated above, the No Action Alternative therefore assumes the project purpose and objectives would not be met and the current level of flood risk would continue.

Consequences of Levee Failure

Assuming that no levee repair or strengthening would occur under the No Action Alternative means that the affected area levee system would remain susceptible to failure as a result of identified deficiencies such as seepage, levee instability, and inadequate geometry. These conditions could cause portions of the levee system to fail, triggering widespread flooding, extensive damage to the planning area's existing residential, commercial, agricultural, and industrial structures, and potential loss of life and property. Extensive damage to utilities, roadways, major interstate transportation corridors, and other infrastructure systems could occur. Water supply and sewage facilities would likely fail. Floodwaters would become contaminated by chemicals released from inundated vehicles, homes, industrial and agricultural facilities, businesses, and equipment. The magnitude of the flood damage would depend upon the location of the levee breach, severity of the storm, and river flows at the time of a potential levee failure.

Flood depth maps prepared for the affected area indicate that under a 200-year flood event scenario, inundation levels would range from 1 foot to 25 feet, depending on the local elevation of

the land surface. Plates 2-13 through 2-19 show the ultimate estimated inundation depths for a 200-year flood event based on levee failures from north to south (upstream to downstream), as well as a composite of failures along the project area levee.

ES.2.3.2 Relationship of FEMA RiskMAP to No Action

Further complicating the future no action scenario is the FEMA RiskMAP process, a national effort to revise FIRMs. FEMA is in the process of reevaluating the level of ~~flood protection~~ performance provided by the levee system protecting the planning area. Portions of the planning area are currently designated as falling under Zone X, meaning it has less than a 1% chance of flooding in any given year (100-year ~~flood protection~~level of performance). If these areas were remapped out of Zone X and into an A, AE, AR, or A-99 Zone, flood insurance would become mandatory for all citizens and businesses that hold Federally guaranteed mortgage loans. In addition, Federal and state regulations would prevent or constrain further development in the basin.

ES.2.3.3 Levee Vegetation Policy and No Action

Compliance with USACE levee vegetation policy in the Sacramento Valley is complex, due to the overlays of flood management objectives, protected fish and wildlife habitat, environmental regulations, overlapping jurisdictional authorities, and recreation and other social values.

In light of these circumstances, the No Action Alternative reflects multiple possible future scenarios. At this time, it is considered too speculative to adopt and consider a single one of these future scenarios as the sole or most likely outcome. Therefore, this document acknowledges and analyzes the following conditions in regard to the USACE levee vegetation policy as it relates to the No Action Alternative for the actions under consideration.

- Full application of USACE levee vegetation policy, as detailed in Engineering Technical Letter 1110-2-571, *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* (ETL), meaning prohibition and removal of woody vegetation within the levee prism or within 15 feet of the landside or waterside levee toes (U.S. Army Corps of Engineers 2009).
- Modified application of the ETL; assumes the continued existence into the future of the vegetation conditions at the time of the analysis. This may include future application of a variance (not as part of the FRWLP) or application of the CVFPP concepts for management of woody vegetation, meaning trimming and thinning to allow visibility and accessibility, selective retention and removal based on engineering inspection and evaluation, and LCM (as described under encroachment removal and vegetation policy compliance).

ES.2.4 Alternative Screening

ES.2.4.1 Screening Criteria

SBFCA established and applied ~~nine~~ seven criteria to qualitatively evaluate measures and alternatives and eliminate those that did not adequately meet the criteria. The criteria are below, along with the options for evaluation. Public feedback, including that gained through the NEPA and CEQA process, is considered as part of the evaluation in screening.

- Meet the project objectives to reduce risk.

- Geography and jurisdictional authority.
- Avoidance of hydraulic effects.
- Land use compatibility.
- Avoidance, minimization, and mitigation of environmental effects.
- Facilitation of multi-use objectives.
- Cost.

ES.2.4.2 Measures and Alternatives Not Carried Forward

Several measures and alternatives for the FRWLP were considered but not carried forward based on the screening criteria presented above. These alternatives are listed below and briefly described in Section 2.7.2.

- Alternative levee alignments.
- Setback levees.
- Ring levees.
- J-levee.
- Reoperation of upstream reservoirs and bypasses.
- Development of additional upstream storage.
- Construction of Feather River Bypass.
- Raising Building Pads.
- River Dredging.

ES.2.5 Environmental Commitments

Environmental commitments are measures incorporated as part of the project description, meaning they are proposed as elements of the proposed action and are to be considered in conducting the environmental analysis and determining effects and findings. Environmental commitments apply to each and all improvements other than the No Action Alternative.

To avoid and minimize construction-related effects, SBFCA will implement the following environmental commitments to reduce or offset short-term, construction-related effects. Measures have been developed for each of the topics below, to be applied to the FRWLP project resource analyses.

- Avoidance measures for valley elderberry longhorn beetle.
- Avoidance measures for ~~G~~giant garter snake.
- Avoidance measures for Swainson's hawk.
- Avoidance measures for ~~R~~raptors.
- Measures for protected and riparian trees.
- Invasive plant species prevention measures.

- Construction limitations near residences.
- ~~Use of native wildflower species in erosion control seed mix~~Native Wildflower Species in Erosion Control Grassland Seed Mix.
- Replant trees and shrubs along The Pacific Gas and Electric Company (PG&E) utility line relocations, in conformance with utility line vegetation clearance zones.
- Soil borrow site reclamation plan.
- Postconstruction operations and maintenance.
- Stormwater pollution prevention plan.
- Bentonite slurry spill contingency plan.
- Spill prevention, control and counter-measure plan.
- Monitoring of turbidity in adjacent water bodies.

Detailed measures have been developed relating to the construction practices and methods for the following features and activities. Detailed discussion is provided in Section 2.5.

- Slurry cutoff walls.
- Slope flattening.
- Stability berms.
- Levee reconstruction.
- Sheet-pile walls.
- Seepage berms.
- Relief wells.
- Depression/ditch infilling.
- Clay ditch lining.
- Encroachment removal and vegetation policy compliance.
- Canal seepage treatment.

Table ES-6 is a summary of the effects of the FRWLP. The effects that are significant and unavoidable or potentially significant and unavoidable are listed below.

- Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions
- Effect NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise
- Effect NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration
- Effect VEG-1: Disturbance or Removal of Riparian Trees
- Effect VEG-4: Potential Loss of Special-Status Plant Populations Caused by Habitat Loss Resulting from Project Construction
- ~~Effect VIS-1: Result in Temporary Visual Effects from Construction~~
- ~~Effect VIS-2: Adversely Affect a Scenic Vista~~

- ~~Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and its Surroundings~~
- ~~Effect VIS-4: Create a New Source of Substantial Light or Glare that would Adversely Affect Day and Nighttime Public Views~~
- Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities
- Effect CR-2: Potential to Disturb Unidentified Archaeological Sites
- Effect CR-3: Potential to Disturb Human Remains
- Effect CR-4: Direct and Indirect Effects on Identified Historic Architectural/Built Environment Resources Resulting from Construction Activities

Table ES-6. Summary of Effects and Mitigation Measures for the Feather River West Levee Project

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
3.1, ~~Flood Control~~Flood Risk Management and Geomorphic Conditions						
Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design	No Action	Operational-intermittent	NA	No effect	None required	No effect
	1, 2, and 3	Operational-intermittent	NA	No effect	None required	No effect
Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design	No Action	Operational-intermittent	NA	No effect	None required	No effect
	1, 2, and 3	Operational-intermittent	NA	No effect	None required	No effect
Effect FC-3: Decrease in Through- and Under-Seepage	No Action	Operational-intermittent	NA	No effect	None required	No effect
	1, 2, and 3	Operational-intermittent	NA	Beneficial	None required	Beneficial
Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage	No Action	Operational-intermittent	NA	No effect	None required	No effect
	1, 2, and 3	Operational-intermittent	NA	Beneficial	None required	Beneficial
Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition	No Action	Operational-intermittent	NA	No effect	None required	No effect
	1, 2, and 3	Operational-intermittent	NA	No effect	None required	No effect
Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area	No Action	Operational-intermittent	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Operational-intermittent	NA	Significant	FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design	No effect
Effect FC-7: Increase in Levee Slope Stability	No Action	Permanent	NA	No effect	None required	No effect
	1, 2 and 3	Permanent	NA	Beneficial	None required	Beneficial
3.2, Water Quality and Groundwater Resources						
Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids	No Action	NA	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Unquantifiable	Less than significant	None required	Less than significant
Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Unquantifiable	Less than significant	None required	Less than significant
Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Unquantifiable	Significant	WQ-MM-1: Implement Provisions for Dewatering	Less than significant
Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	Negligible to 3-foot increase in groundwater levels	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
3.3, Geology, Seismicity, Soils and Mineral Resources						
Effect GEO-1: Beneficial Change in Levee Stability	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	Increase to 200-year ~~flood protection~~level of performance in urban areas; 100-year ~~flood protection~~level of performance in rural areas	Beneficial	None required	Beneficial
Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking	No Action	Operational-intermittent	NA	No effect	None required	No effect
	1, 2, and 3	Operational-intermittent	NA	Less than significant	None required	Less than significant
Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	NA	Less than significant	None required	Less than significant
Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project	No Action	NA	Tons of aggregate	No effect	None required	No effect
	1, 2, and 3	NA	Tons of aggregate: Alt. 1: 109,000 Alt. 2: 87,125 Alt. 3: 105,900	Less than significant	None required	Less than significant
Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	NA	Less than significant	None required	Less than significant
3.4, Transportation And Navigation						
Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic	No Action	Temporary	Road segment LOS within Caltrans standards	No effect	None required	No effect
	1, 2, and 3	Temporary	Road segment LOS within Caltrans standards	Less than significant	None required	Less than significant
Effect TRA-2: Temporary Road Closures	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect TRA-4: Increase in Emergency Response Times	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect TRA-7: Temporary Changes to Navigation	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	~~Less than significant~~No effect	None required	~~Less than significant~~No effect
Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
3.5, Air Quality						
Effect AQ-1: Obstruction of an Applicable Air Quality Plan	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Alt. 1, 2: Exceedance of CEQA emission thresholds for ROG, NO_X and PM10 in the FRAQMD, and NO_X and PM10 thresholds in the BCAQMD Alt. 3: Exceedance of CEQA emission thresholds for ROG~~, NO_X and PM10~~ in the FRAQMD~~, and NO_X thresholds in the BCAQMD~~	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay ~~Required~~ Fees to FRAQMD and BCAQMD Sufficient to Offset Annual Construction NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Significant and unavoidable
Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1~~, 2,~~ and 3	Temporary	Exceedance of the federal *de minimis* threshold for NO_X for all construction years	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment ~~AQ-MM-5: Pay Required Fees to FRAQMD and BCAQMD to Offset Annual Construction NO_X Emissions to Net Zero (0)~~	Less than significant
	2	Temporary	Exceedance of the federal *de minimis* threshold for NO_X for all construction years	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay Fees to FRAQMD and BCAQMD Sufficient to Offset Annual Construction NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
					or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	
Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	NA	Less than significant	None required	Less than significant
Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
3.6, Climate Change and Greenhouse Gas						
Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	CO_2 emissions project-wide tons/year: Alt. 1: 486 Alt.2: 761 Alt. 3: 528 Annualized over the 50-year levee lifespan. Presumptive threshold is 7,000 metric tons/year.	Less than significant	CC-MM-1: Implement Measures to Minimize GHG Emissions during Construction	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change	No Action	Permanent	NA	Too speculative	None required	Too speculative
	1, 2, and 3	Permanent	NA	Beneficial	None required	Beneficial
3.7, Noise						
Effect NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Under all construction contracts, scattered rural residences and residences in some nearby cities could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.	Significant	NOI-MM-1: Employ Noise-Reducing Construction Practices	Significant and unavoidable
Effect NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Temporary	Ground vibration could exceed 0.2 inch per second when necessary to operate equipment within 30 feet of residences and other structures.	Significant	NOI-MM-2: Employ Vibration-Reducing Construction Practices	Significant and unavoidable
3.8, Vegetation and Wetlands						
Effect VEG-1: Disturbance or Removal of Riparian Trees	No Action	Permanent	Full application of ETL: approximately 1,000 trees removed	Significant and unavoidable in the short term, less than significant after establishment of compensatory vegetation	Assumed that vegetation loss would be mitigated	Significant and unavoidable in the short term, less than significant after establishment of compensatory vegetation
			Modified application of ETL: Unknown number of trees, but expected to be relatively low	Less than significant	Assumed that vegetation loss would be mitigated	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Permanent	Alt. 1: Loss of 206 riparian trees and total loss of 3,911 inches of DBH on the waterside of the levee Alt. 2: 206 riparian trees and total loss of 3,911 inches of DBH on the waterside of the levee Alt. 3: 209 riparian trees and total loss of 3,979 inches of DBH on the waterside of the levee	Significant	VEG-MM-1: Compensate for the Loss of Woody Riparian Trees VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor	Significant and unavoidable (short term) Less than significant (long term after establishment of compensatory vegetation)
Effect VEG-2: Loss of Wetlands and Other Waters of the United States as a Result of Project Construction (See Section 3.8.2.2 for description of waterbodies)	No Action	Permanent	No impact or negligible impacts~~Acres~~	No effect	None required	No effect
	1, 2, and 3	Permanent	Alt. 1: Loss of 0.35 acre forested/ shrub wetland, 24.96 acres of canal/ditch, 0.14 acre of tailing wetlands, 0.17 acre of open water, 0.18 acre of seasonal wetlands Alt 2: Loss of 0.35 acre forested/ shrub wetland, 27.54 acres of canal/ ditch, 0.58 acre of tailing wetland, 0.62 acre of open water, 1.91 acres of pond/basin, and 0.62 acre	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-5: Compensate for the Loss of Wetlands and Other	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
			of seasonal wetlands Alt. 3: Loss of 0.03 acre forested/ shrub wetland, 0.207 acre of canal/ditch, 0.131 acres of tailing wetlands, 0.038 acre of open water, and 0.026 acre of seasonal wetlands		Waters	
Effect VEG-3: Disturbance or Removal of Protected Trees (See Page 3.8-26 for definition) as a Result of Project Construction	No Action	Permanent	No loss~~Individual trees~~	No effect	None required	No effect
	1, 2, and 3	Permanent	Alt. 1: 5,359 individual trees Alt.2: 6,318 individual trees Alt.3: 5,237 individual trees~~Numerous riparian and non-riparian trees~~	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor ~~VEG-MM-6: Conduct a Tree Survey~~ VEG-MM-6~~7~~: Compensate for Loss of Protected Trees	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect VEG-4: Potential Loss of Special-Status Plant Populations Caused by Habitat Loss Resulting from Project Construction	No Action	Permanent	No impact or negligible impacts~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent	No impact or negligible impacts ~~NA~~	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-7~~8~~: Retain Qualified Botanists to Conduct Floristic Surveys for Special-Status Plants during Appropriate Identification Periods VEG-MM-8~~9~~: Avoid or Compensate for Substantial Effects on Special-Status Plants	Significant and unavoidable ~~until surveys can demonstrate efficacy of mitigation measures; less than significant if mitigation measures demonstrate avoidance~~
Effect VEG-5: Introduction or Spread of Invasive Plants as a Result of Project Construction	No Action	Permanent	No impact or negligible impacts~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent	No impact or negligible impacts ~~NA~~	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect VEG-6: Conflict with Provisions of an Adopted HCP/NCCP or Other Approved Local, Regional, or State Habitat Conservation Plan	No Action	Permanent	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
3.9, Wildlife						
Effect WILD-1: Potential Mortality of or Loss of Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle	No Action	Permanent or temporary	No impact or negligible impacts~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent and temporary	Permanent/Temporary effects on habitat: Alts. 1,2, and 3: 0 /0 acres	Significant	WILD-MM-1: ~~Conduct Focused Surveys for~~ Fence and Avoid Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle and Implement Protective Measures	Less than significant
Effect WILD-2: Potential Mortality or Disturbance of VELB and its Habitat (Elderberry Shrubs)	No Action	Permanent ~~or temporary~~	No impact or negligible impacts ~~NA~~	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Permanent ~~and temporary~~	Permanent~~/temporary~~ effect on elderberry shrubs: Alt. 1: 88~~90~~ ~~/72~~ Alt. 2: 91~~89/72~~ Alt. 3: 91~~82/83~~	Significant	WILD-MM-2: ~~Implement Protective Measures and Compensate for Effects on VELB and its Habitat~~Conduct VELB Surveys Prior to Elderberry Shrub Transplantation WILD-MM-3: Implement Measures to Protect VELB and its Habitat WILD-MM-4: Compensate for Effects on VELB and its Habitat	Less than significant
Effect WILD-3: Potential Mortality or Disturbance of Western Pond Turtle	No Action	Permanent or temporary	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent and temporary	Permanent/temporary (acres of habitat) Alt. 1: 25.62/0.99 Alt. 2: 31/0.96 Alt. 3: 9.83/0.11	Significant	WILD-MM-5~~3~~: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed	Less than significant
Effect WILD-4: Potential Disturbance or Mortality of and Loss of Suitable Habitat for Giant Garter Snake	No Action	Permanent or temporary	No impact or negligible impacts ~~NA~~	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Permanent and temporary	Permanent/temporary Acres aquatic habitat: Alt. 1: 0.73/23.6 Alt. 2: 2.9/25.49 Alt. 3: 0.004/6.81 Acres upland habitat: Alt. 1: 1.17/143.41 Alt. 2: 1.17/149.99 Alt. 3: 0/118.80	Significant	WILD-MM-64: Avoid and Minimize Construction Effects on Giant Garter Snake WILD-MM-75: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-MM-8: Compensate for Permanent Loss of Suitable Giant Garter Snake Habitat WILD-MM-9: Restore Temporarily Disturbed Giant Garter Snake Aquatic and Upland Habitat to Pre-Project Conditions	Less than significant
Effect WILD-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and Loss of Nesting and Foraging Habitat	No Action	Permanent or temporary	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent ~~and temporary~~	Permanent~~/temporary~~ Loss of nesting and foraging habitat (acres of riparian forest): Alt. 1: 844 Alt. 2: 1,585 Alt. 3: 1,151 Loss of foraging habitat (acres of field and row crops and ruderal): Alt. 1: 17.41/744.48 Alt. 2: 2.03/780.84 Alt. 3: 4.75/750.63	Significant	WILD-MM-106: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-117: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction and Implement Protective Measures during Construction WILD-MM-128: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect WILD-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special Status Birds and Removal of Suitable Breeding Habitat	No Action	Permanent or temporary	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent and temporary	Removal of riparian forest, ruderal areas, and field crops, and nest trees during breeding season	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-13~~90~~: Conduct Nesting Surveys for Special-Status and Non–Special Status Birds and Implement Protective Measures during Construction	Less than significant
Effect WILD-7: Potential Loss or Disturbance of Western Burrowing Owl and Loss of Nesting and Foraging Habitat	No Action	Permanent or temporary	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent and temporary	Permanent/temporary (acres of field and row crops and ruderal): Alt. 1: 17.41/744.48 Alt. 2: 2.03/780.84 Alt. 3: 4.75/750.63	Significant	WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-14~~0~~: Conduct Surveys for Western Burrowing Owl prior to Construction and Implement Protective Measures if Found WILD-MM-15~~1~~: Compensate for the Loss of Occupied Western Burrowing Owl Habitat	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect WILD-8: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat	No Action	Permanent or temporary	No impact or negligible impacts ~~NA~~	No effect	None required	No effect
	1, 2, and 3	Permanent and temporary	Permanent/Temporary (acres roosting habitat): Alt. 1: 223.66/38.16 Alt. 2: 693.13/40.85 Alt. 3: 124/10.36	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-16~~2~~: ~~Conduct Preconstruction Surveys for~~Identify Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-9: Potential Injury, Mortality or Disturbance of Ringtail and Removal of Habitat	No Action	Permanent or temporary	No impact or negligible impacts	No effect	None required	No effect
	1, 2, and 3	Permanent or temporary	Removal of riparian habitat/trees	Significant	WILD-MM-17: Identify Suitable Shelter and Denning Habitat for Ringtail and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-10~~9~~: Disturbance to or Loss of Common Wildlife Species and Their Habitats	No Action	Permanent or temporary	No impact or negligible impacts~~N/A~~	No effect	None required	No effect
	1, 2, and 3	Permanent or temporary	No impact or negligible impacts~~N/A~~	Less than significant	None required	Less than significant
Effect WILD-11~~0~~: Potential Disruption of Wildlife Movement Corridors	No Action	Permanent or temporary	No impact or negligible impacts~~N/A~~	No effect	None required	No effect
	1, 2, and 3	Permanent or temporary	No impact or negligible impacts~~N/A~~	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect WILD-121: Conflict with Provisions of an Adopted HCP/NCCP or other Approved Local, Regional, or State Habitat Conservation Plan	No Action	Permanent	No impact or negligible impactsN/A	No effect	None required	No effect
	1, 2, and 3	Permanent	N/A	No effect	None required	No effect
3.10, Fish and Aquatic Resources						
Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)	No Action	Permanent	Full application of ETL: approx. 1,000 trees on water-side of levee removed	Significant and unavoidable in the short term and less than significant in the long term with compensatory vegetation	Assumed compensatory vegetation	Significant and unavoidable in the short term and less than significant in the long term with compensatory vegetation
			Modified application of ETL: unknown number of trees, but expected to be relatively low	Less than significant	None required	Less than significant
	1, 2, and 3	Permanent and temporary	Linear feet and acreageSee Table 3.8-6	Less than significant	None required	Less than significant
Effect FISH-2: Construction-Related Erosion Resulting in Substantially Increased Sedimentation and Turbidity	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
3.11, Agriculture, Land Use, and Socioeconomics						
Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities	No Action	Temporary	Acreage	No effect	None required	No effect
	1, 2, and 3	Temporary	<u>Sutter County:</u> Alt. 1: 18.7 acres prime farmland; 4.99 acres farmland of statewide importance Alt. 2: 18.8 acres prime farmland, 5.24 acres farmland of statewide importance Alt. 3: 5.57 acres prime, 0.57 acre farmland of statewide importance <u>Butte County:</u> Alt. 1: 11.77 acres prime farmland Alt. 2: 12.11 acres prime farmland Alt. 3: 8.2 acres prime,	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
			0.25 acre farmland of statewide importance			
Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance	No Action	Permanent and temporary	NA	Too speculative	None required	Too speculative
	1, 2, and 3	Permanent	<u>Sutter County:</u> Alt.1: 181.72 acres prime farmland (0.11%), 2.79 acres unique farmland (0.02%), 6.37 acres (0.03%) farmland of statewide importance Alt. 2: 555.24 acres prime farmland (0.34%), 2.79 acres unique farmland (0.02%), 117.87 acres farmland of statewide importance (0.1%) Alt. 3: 85.03 acres prime farmland (0.05%), 4.37 acres unique farmland (0.02%), 13.83 acres farmland of statewide importance (0.01%) <u>Butte County:</u> Alt. 1: 82.49 acres (0.04%) prime farmland 3.08 acres (0/01%) unique farmland Alt. 2: 166.78 acres prime farmland (0.09%),	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
			3.19 acres unique farmland (0.01%) Alt. 3: 41.38 acres prime farmland (0.02%), 4.65 acres unique farmland (0.02%)			
Effect AG-3: Conflict with Existing Zoning for Agricultural Use	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	NA	Less than significant	None required	Less than significant
Effect AG-4: Conflict with Williamson Act Contract	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	Permanent/Temporary (acres) Alt. 1: 83.02 / 4,89 Alt. 2: 133.99 / 4.9 Alt. 3: 67.65 / 13.67	Less than significant	None required	Less than significant
Effect AG-5: Loss of Agricultural Production	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	Loss in acres (% of total in Sutter and Butte Co): Alt. 1: 587.46 (0.06%) Alt. 2: 1,126.88 (0.1%) Alt. 3: 430.38 (0.05%)	Less than significant	None required	Less than significant
Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	NA	Less than significant	None required	Less than significant
Effect SOC-1: Temporary Increase in Study Area Employment during Construction	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Temporary	Total construction-related expenditures (direct costs): Alt. 1: $321,535,000 Alt. 2: $527,373,000 Alt. 3: $288,847,000	Beneficial	None required	Beneficial
Effect SOC-2: Conflict with Applicable Land Use Plan, Policy, or Regulation	No Action	Permanent	NA	No effect	None required	No effect
	1, 2, and 3	Permanent	NA	Less than significant	None required	Less than significant
3.12, Population, Housing, and Environmental Justice						
Effect POP-1: Displacement of Existing Housing Units	No Action	Permanent and temporary	NA	No effect	None required	No effect
	1, 2, and 3	Permanent and temporary	Residences to be acquired: Alt. 1: 5 Alt. 2: 17 Alt. 3: 5 Potential for temporary displacement under all alternatives	Significant	POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan	Less than significant
Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
3.13, Visual Resources						
Effect VIS-1: Result in Temporary Visual Effects from Construction	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1 and 3	Temporary	NA	Less than significant	None required	Less than significant
	2	Temporary	NA	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-2: Adversely Affect a Scenic Vista	No Action	Permanent	NA	No effect	None required	No effect
	1 and 3	Permanent	NA	Less than significant	None required	Less than significant
Reaches 6, 12–15, 17, 24, 25–28, 34, 39; 2, 4, 16, 20, 22, 31–33, 35, 37, 38	2	Permanent	NA	Less than significant	None required	Less than significant
Reaches 3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, 41	2	Permanent	NA	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings	No Action	Permanent	NA	No effect	None required	No effect
	1 and 3	Permanent	NA	Less than significant	None required	Less than significant
Reaches 6, 12–15, 17, 24–29, 34, 39; 2, 4, 16, 20, 22, 31–33, 35, 37, 38	2	Permanent	NA	Less than significant	None required	Less than significant
Reaches 3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, 41	2	Permanent	NA	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day and Nighttime Public Views	No Action	Permanent	NA	No effect	None required	No effect
	1 and 3	Permanent	NA	Less than significant	None required	Less than significant
	2	Permanent	NA	Less than significant	None required	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
3.14, Recreation						
Effect REC-1: Temporary Changes in Recreation Opportunities during Construction	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Less than 0.1% of recreation areas	Less than significant	None required	Less than significant
Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor	No Action	Permanent	NA	Too speculative	None required	Too speculative
	1, 2, and 3	Permanent	Less than 2% of recreation areas	Less than significant	None required	Less than significant
3.15, Utilities and Public Services						
Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Significant	UTL-MM-1: Coordinate with Water Supply Users before and during All Water Supply Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply	Less than significant
Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Significant	UTL-MM-2: Verify Utility Locations, Coordinate with Utility Providers, Prepare a Response Plan, and Conduct Worker Training	Less than significant

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Effect UTL-3: Increase in Solid Waste Generation	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	Cubic yards of solid waste generated during construction Alt. 1: 819,097 Alt. 2: 378,800 Alt. 3: 813,152	Less than significant	None required	Less than significant
Effect UTL-4: Increase in Emergency Response Times	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Less than significant	None required	Less than significant
3.16, Public Health and Environmental Hazards						
Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Significant	~~PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures~~Environmental Commitment: Stormwater Pollution Protection Plan	Less than significant
Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities	No Action	Temporary	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Temporary	NA	Significant	Environmental Commitment: Stormwater Pollution Protection Plan PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures PH-MM-2: Employment of a Toxic Release Contingency Plan	Less than significant
Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site and Vehicles	No Action	Temporary	NA	No effect	None required	No effect
	1, 2, and 3	Temporary	NA	Significant	PH-MM-3: Implementation of Construction Site Safety Measures PH-MM-4: Implementation of an Emergency Response Plan	Less than significant
Effect PH-4: Exposure of People or Structures to Increased Flood Risk	No Action	Permanent	NA	Too speculative	None required	Too speculative
	1, 2, and 3	Permanent	NA	Beneficial	None required	Beneficial
3.17, Cultural Resources						
Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities	No Action	Permanent	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Permanent	NA	Significant	CR-MM-1: Perform Data Recovery to Retrieve Information Useful in Research~~Perform Field Studies, Evaluate Identified Resources and Determine Effects, Develop Treatment to Resolve Significant Effects~~	Significant and unavoidable
Effect CR-2: Potential to Disturb Unidentified Archaeological Sites	No Action	Permanent	NA	Too speculative	None required	Too speculative
	1, 2, and 3	Permanent		Significant	CR-MM-2: Complete Surveys Prior to Construction, Implement a Cultural Resources Discovery Plan, Provide Related Training to Construction Workers, and Conduct Construction Monitoring~~Implement a Cultural Resources Discovery Plan, Perform Training of Construction Workers, and Conduct Construction Monitoring~~	Significant and unavoidable
Effect CR-3: Potential to Disturb Human Remains	No Action	Permanent	NA	Too speculative	None required	Too speculative
	1, 2, and 3	Permanent	NA	Significant	CR-MM-3: Monitor Culturally Sensitive Areas during Construction, Follow State and Federal Law Governing Human Remains if Such Resources are Discovered during Construction	Significant and unavoidable
Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities	No Action	Permanent	NA	No effect	None required	No effect

Effect	Alternative	Duration	Quantification of Impact (Where Applicable)	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
	1, 2, and 3	Permanent	NA	Significant	CR-MM-4: Complete Inventory of Built Environment Resources in Inaccessible Parcels, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects~~Conduct Inventory, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects~~	Significant and unavoidable

NA = not applicable.

ES.2.6 Major Conclusions of the Environmental Analysis

ES.2.6.1 ~~Flood Control~~Flood Risk Management and Geomorphic Conditions

Construction of any of the FRWLP EIS/EIR alternatives would be a ~~flood control~~flood risk management benefit in the planning area although existing drainage patterns could be altered. This impact would be mitigated to less than significant by coordinating with owners and operators, preparing drainage studies, and remediating effects through project design.

Water Quality and Groundwater Resources

Dewatering of construction areas (e.g. removing groundwater that may fill trenches dug for cutoff wall construction) could result in the release of contaminants to surface or groundwater. This impact would be mitigated to less than significant by implementing provisions for dewatering effluent before it is discharged.

Geology, Soils, Seismicity, and Mineral Resources

Construction activities associated with any of the FRWLP EIS/EIR alternatives would not result in any significant impacts to geology, soils, seismicity, and mineral resources. Without project implementation, beneficial effects, such as improved levee stability and decreased levee bank erosion would not be realized.

Traffic, Transportation, and Navigation

Temporary increases in construction-related traffic, temporary road closures, emergency response times, and other traffic, transportation and navigation effects from project implementation were determined to be less than significant under all action alternatives.

Air Quality

Implementation of the FRWLP would result in temporary construction-related emissions that would be partially mitigated by reducing vehicle and equipment emissions and implementing a fugitive dust plan. Regardless of the mitigation measures, the temporary construction emissions produced by the FRWLP would be significant and unavoidable on a project-level basis.

Climate Change and Greenhouse Gas

Construction activity for the FRWLP would cause a temporary and less than significant increase in greenhouse gas emissions.

Noise

Implementation of any of the project alternatives would result in temporary but significant effects related to construction noise and vibration in the affected area. Mitigation measures to employ noise-reducing and vibration-reducing construction practices will not be sufficient to reduce the exposure of sensitive receptors to temporary construction noise and vibration to less than significant.

Vegetation and Wetlands

Project implementation would result in permanent loss of vegetation and wetlands. Compensation of lost vegetation and wetlands would mitigate those effects with the goal of no net loss.

Wildlife

Construction of any of the FRWLP alternatives would result in the injury, mortality, or disturbance of special-status and common species during construction, which could affect local populations. Implementation of mitigation measures would minimize or avoid these impacts and bring the effects down to a less than significant level.

Fish and Aquatic Resources

The project would have no effect on SRA cover and critical habitat; however, there may be effects on ESA-listed fish species due to loss of floodplain riparian vegetation. Vegetation loss would be minimized and all activities would occur above the ordinary high water mark on the waterside levee slopes and toe. Thus, the project is not expected to contribute to significant effects on fish and aquatic resources.

Agriculture, Land Use, and Socioeconomics

Implementation of the FRWLP would permanently convert farmland to nonagricultural use in the direct footprint of the project. Overall, the project is intended to preserve existing land use and socioeconomic conditions, especially for agriculture. Additionally, ~~flood control~~flood risk management activities are typically considered public uses, which are largely consistent with the land use policies and regulations governing the project area. Construction activities would temporarily increase employment and personal income in the local area.

Population, Housing, and Environmental Justice

Project implementation of any of the FRWLP alternatives will require displacement of existing housing units. Permanent acquisition, relocation, and compensation services will be conducted in compliance with Federal and state relocation laws. In cases where project construction is temporarily disruptive to nearby residents, SBFCA will provide assistance for residents to relocate temporarily during construction activities and provide compensation to residents for reasonable rent and living expenses incurred as a result of relocation.

The FRWLP alternatives would not result in disproportionately high and adverse effects on minority populations and low-income populations from acquisition of homes because plenty of vacant homes exist within the affected area to serve as replacement housing.

Visual Resources

The FRWLP could potentially result in significant visual effects in reaches with sensitive viewers for one or more project alternatives. The effect mechanisms are primarily vegetation removal and replacement of agricultural and developed land use with seepage berms. Construction activities would also have temporary visual effects.

Recreation

The FRWLP would not have any permanent effects on recreation in the project area. Temporary access to recreational facilities along the Feather River would be an impact and addressed by providing notification of construction area closures to protect public safety.

Utilities and Public Services

Construction of the project may damage drainage and irrigation systems and public utility infrastructure, resulting in temporary disruptions to service. Coordination with drainage and irrigation systems users, consultation with service providers, and implementation of appropriate protection measures would minimize the possibility of any significant effects.

Public Health and Environmental Hazards

Project implementation has the potential to slightly increase risks to the public during construction through use of equipment and fuels, but the increased risk is temporary. These risks are minimized by implementation of a stormwater pollution prevention plan and the best management practices it contains to control accelerated erosion, sedimentation, and other pollutants during and after project construction.

Cultural Resources

Cultural resources are known to exist throughout the planning area. Cultural resources would be disturbed and destroyed under any of the project alternatives. While mitigation measures have been identified, the mitigation does not reduce the contribution of the project alternatives to less than significant.

Contents

Appendices

[Included on Attached CD]

Tables

Figures and Plates

Acronyms, ~~and~~ Abbreviations, and Shortened Forms

°F	Fahrenheit
2009 Plan	Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ADT	average daily traffic
ADWF	average dry weather flow
AEP	annual exceedance probability
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
APA	applicant-preferred alternative
APE	area of potential effects
ARB	California Air Resources Board
ARPA	Archaeological Resources Protection Act
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
BA	biological assessment
Basin Plan	Water Quality Control Basin Plan, Central Valley Region – The Sacramento River Basin and the San Joaquin River Basin
BCAQMD	Butte County Air Quality Management District
BFE	base flood elevation
BMP	best management practice
BO	biological opinion
BOD	biochemical oxygen demand
BRCP	Butte Regional Conservation Plan
BSSCP	bentonite slurry spill contingency plan
CAA	Clean Air Act
CAAA	1990 Clean Air Act amendments
CAAQS	California Ambient Air Quality Standards
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAR	Coordination Act Report
CBSC	California Building Standards Code
CCAA	California Clean Air Act
CCASCW	Climate Change Adaptation Strategies for California's Water
CCR	California Code of Regulations
CDEC	California Data Exchange Center
CDFA	California Department of Food and Agriculture

~~DFG~~CDFW	California Department of Fish and ~~Game~~Wildlife (formerly DFG)
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CHRIS	California Historical Information System
CIWMP	countywide integrated waste management plan
CL	lean clay
CL or CH	clay
CLSM	Controlled Low Strength Material
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPPA	California Native Plant Protection Act of 1977
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Common Features	American River Common Features Project
Comp Study	Sacramento–San Joaquin River Basins Comprehensive Study
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CRS	Community Rating System
CSLC	California State Lands Commission
CTR	California Toxics Rule
CVFPA	Central Valley Flood Protection Act
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVHM	Central Valley Hydrologic Model
CVIFMS	Central Valley Integrated Flood Management Study
CVP	Central Valley Project
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibels
dbh	diameter at breast height
DDT	Dichlorodiphenyltrichloroethane
DEIR	Draft Environmental Impact Report
Delta	Sacramento–San Joaquin River Delta

DO	dissolved oxygen
DOI	U.S. Department of the Interior
DPM	diesel particulate matter
DPR	California Department of Parks and Recreation
DPS	distinct population segment
DSM	deep soil mixing
DSOD	Division of Safety of Dams
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	Electrical conductivity
EFH	essential fish habitat
EFS	environmental field specialist
EIP	early implementation project
EIR	environmental impact report
EIS	environmental impact statement
EM	2004 Engineering Manual 1110-1-400
EO	executive order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
ETL	Engineering Technical Letter 1110-2-571, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures
FEIS/FEIR	final environmental impact statement/final environmental impact report
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FPIIB	Flood Project Integrity and Inspection Branch
FPPA	Farmland Protection Policy Act
FR	Federal Register
FRAQMD	Feather River Air Quality Management District
FRM	flood-risk management
FRWA	Feather River Wildlife Area
FRWLP, or project	Feather River West Levee Project
G	the acceleration speed of gravity
GC	Government Code
GGS	giant garter snake
GHG	greenhouse gase
GIS	geographic information systems
GLO	General Land Office
GO	General Order
GPS	~~geographic~~ global positioning system

GRR	General Reevaluation Report
GWP	global warming potential
HCP	habitat conservation plan
HCPs/NCCP	Habitat Conservation Plans/Natural Community Conservation Plan
HEC-RAS	Hydraulic Engineering Center River Analysis System
HFCs	hydrofluorocarbons
HTRW threats	Hazardous, Toxic, or Radioactive Waste
HUC	Hydrologic Unit Code
Hz	Hertz
in/sec	inches per second
IPCC	Intergovernmental Panel on Climate Change
ITR	independent techinical review
IWM	instream woody material
LCM	life-cycle management
LD	Levee District
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LFRCMP	Lower Feather River Corridor Management Plan
LL	Liquid Limit
LM	levee mile
L_{min} and L_{max}	minimum and maximum sound levels
LOS	level of service
LPG	liquid propane gas
LRR	Limited Reevaluation Report
L_{xx}	percentile-exceeded sound levels
MAF	million acre-feet
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MA	Maintenance Area
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MG	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
ML	silt
MLD	most likely descendant
MMP	Mitigation and Monitoring ~~Proposal~~Plan
MOU	memorandum of understanding
MRZ	mineral resource zone
MS4 General Permit	General Permit for Municipal Separate Storm Sewer Systems
MT	metric tons

Mw	expected earthquake magnitudes
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NAICS	North American Industry Classification System
NAVD 88	North American Vertical Datum of 1988
NCCP	natural community conservation plan
NEIC	Northeastern Information Center
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGO	non-governmental organization
NGVD 29	National Geodetic Vertical Datum of 1929
NHPA	National Historic Preservation Act
NLIP	Natomas Levee Improvements Program
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOD	Notice of Determination
NOI	Notice of Intent
NOP	Notice of Preparation
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSF/ANSI	National Sanitation Foundation/American National Standards Institute
NTR	National Toxics Rule
NTU	nephelometric turbidity unit
NWP ~~12~~	Nationwide Permit ~~12~~
O&M	operations and maintenance
O_3	ozone
OHWM	ordinary high water mark
OWA	Oroville Wildlife Area
P1GDR	Phase 1 Geotechnical Data Report
P1GER	Phase 1 Preliminary Geotechnical Evaluation Report
PA	programmatic agreement
Pb	lead
PBI	Peterson Brustad Inc.
P-C	Production-Consumption
PCB	Polychlorinated biphenyl
PCN	Pre-Construction Notification
PFC	perfluorocarbon

PG&E	~~The~~ Pacific Gas and Electric Company
pH	potential of hydrogen
PI	Plasticity Index
PJD	preliminary jurisdictional determination
PL	Public Law
PM	particulate matter
PM10	particulate matter 10 microns in diameter or less
PM2.5	particulate matter 2.5 microns in diameter or less
ppm	part per million
PPMP	pollution prevention and monitoring program
PPV	peak particle velocity
PRC	Public Resources Code
~~Programmatic Consultation~~	~~*Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California*~~
RD	Reclamation District
Reclamation Board	Reclamation Board of the State of California
RFDG	Recreation Facility Design Guidelines
risk MAP	mapping, assessment, and planning
RM	River Mile
rms	root-mean-squared
ROD	Record of Decision
ROG	reactive organic gases
ROW	right-of-way
RPW	relatively permanent water
RWQCB	Regional Water Quality Control Board
SacRCEM	Sacramento Roadway Construction Emission Model Version 6.3.2, July 2009
SAFCA	Sacramento Area Flood Control Agency
SB	Senate Bill
SBC	Sutter Butte Canal
SBFCA	Sutter Butte Flood Control Agency
SBPFS	Sutter Basin Pilot Feasibility Study
SF6	sulfur hexafluoride
SGDR	Supplemental Geotechnical Data Report
SHPO	State Historic Preservation Officer
SIP	state implementation plan
SM or SC	silty sand and clayey sand
SMARA	Surface Mining and Reclamation Act of 1975
SO2	sulfur dioxide
SPCCP	spill prevention, control, and counter-measure plan

SR	State Route
SRA	Shaded riverine aquatic
SRBPP	Sacramento River Bank Protection Project
SRFCP	Sacramento River Flood Control Project
SSAC	steel supported aluminum conductor
SSIA	State Systemwide Investment Approach
State Water Board	State Water Resources Control Board
Superfund	Comprehensive Environmental Response, Compensation, and Liability Act
SVAB	Sacramento Valley Air Basin
SWANCC	Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers
SWIF	system-wide improvement framework
SWMP	Stormwater Management Plan
SWP	State Water Project
SWPPP	stormwater pollution prevention plan
System Evaluation	Sacramento River Flood Control System Evaluation
TACs	toxic air contaminants
TBR	Technical Background Report
TCM	traffic control measure
TDS	total dissolved solids
TMDL	total maximum daily load
~~TNW~~	~~tributaries of navigable waters~~
TRLIA	Three Rivers Levee Improvement Authority
TSS	Total suspended sediment
UBC	Uniform Building Code
ULDC	Urban Levee Design Criteria
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in 1987
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USACE Model	USACE Common Features
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
V/C	volume-to-capacity
valley	Sacramento Valley
VELB	valley elderberry longhorn beetle
VFZ	vegetation free zones
WDA	Wetland Delineation Area
WDR	waste discharge requirement
WRDA	Water Resources Development Act

WSAFCA	West Sacramento Area Flood Control Agency
WSE	water surface elevation
WWTP	wastewater treatment plant
Yuba-Sutter NCCP/HCP	Yuba-Sutter Natural Community Conservation Plan and Habitat Conservation Plan
µg/L	micrograms per liter
µS/cm	microSiemens per centimeter

Chapter 1
Introduction

The Sutter Butte Flood Control Agency (SBFCA) is proposing the Feather River West Levee Project (FRWLP, or project) to reduce flood risk in the Sutter Basin, which includes portions of Sutter and Butte Counties in the Sacramento Valley of California.

To protect human health and safety and prevent adverse effects on property and the regional economy, SBFCA was formed as a joint powers authority in 2007 through a joint exercise of powers agreement by the Counties of Sutter and Butte; the Cities of Yuba City, Gridley, Live Oak, and Biggs; and Levee Districts (LDs) 1 and 9. SBFCA was established to coordinate the planning and construction of flood risk managementprotection facilities and to finance the local share of flood management projects. SBFCA's member agencies as well as the State of California are responsible for the operations and maintenance (O&M) of the detention basins, pump stations, and levees that protect the area.

In partnership with the State of California (through the Department of Water Resources [DWR] and Central Valley Flood Protection Board [CVFPB]), SBFCA embarked on a comprehensive evaluation of the condition of the levees protecting the area in 2007, the results of which are also being used by the U.S. Army Corps of Engineers (USACE). The evaluation was necessary to identify the magnitude and severity of deficiencies and determine measures to address the deficiencies. The results of the comprehensive evaluation revealed that substantial construction is necessary to meet current flood protectionlevel of performance standards.

In light of the flood risk to the area, SBFCA is leading the planning, design, and construction of the FRWLP, in partnership with DWR. This project is being conducted in coordination and parallel with a separate planning study led by USACE in partnership with SBFCA, DWR, and the CVFPB, to determine the Federal interest in a flood risk reduction project in the Sutter Basin. As described in Section 1.5.2, the USACE is conducting a feasibility study (the Sutter Basin Pilot Feasibility Study (SBPFS) or Sutter Basin Feasibility Study). The FRWLP is being advanced by SBFCA to expeditiously reduce flood risk before the feasibility study is completed. USACE plans to release for public review an integrated Sutter Basin Draft Pilot Feasibility Report and Draft EIR/Draft Supplemental EIS in May 2013. For purposes of identifying the project proposed for federal authorization, and because this document (i.e., the FRWLP FEIS) analyzes a project whose reach and environmental impacts are similar to those of the SBPFS, the actions proposed in the FRWLP EIS will be supplemented to include work associated with the SBPFS, including an additional reach of levee improvements and impacts on vegetation. As such, the SBPFS EIS will supplement the analyses and conclusions reached by USACE in this Final EIS. SBFCA has certified and adopted the Final EIR for the FRWLP and filed a Notice of Determination. The scope of the CEQA effect analysis in the SBPFS EIR will incorporate by reference relevant information, analyses and conclusions of the FRWLP Final EIR.The project is undergoing a feasibility study led by USACE, Sacramento District, as described in Section 1.5.2; this has been termed the *Sutter Basin Pilot Feasibility Study* or *Sutter Basin Feasibility Study*. The FRWLP is being advanced by SBFCA to expeditiously reduce flood risk before the feasibility study is completed and an anticipated recommendation is made to Congress for project authorization and eventual appropriation – typically a lengthy process that may take 10 or more years. SBFCA anticipates that (1) rehabilitation of remaining segments of the levee system (not of covered by FRWLP) would be implemented by USACE and (2) the non-Federal costs SBFCA incurs for the

~~FRWLP will be credited against the remaining non-Federal share of the cost of the project approved under the feasibility study. USACE plans to release for public review a draft integrated study report and environmental impact statement (EIS)/environmental impact report (EIR) in February 2013. The final integrated feasibility study report would then be completed and presented to Congress in 2014. Because the FRWLP and the USACE study may affect the same general area, have similar purposes, and share potential measures and effects, the EIS/EIR prepared for the feasibility study is expected to incorporate by reference much of the information, analyses, and conclusions contained within this document. The EIS/EIR would supplement this EIS/EIR focusing on additional alternatives, their effects, or new information not addressed in this document.~~

To construct the FRWLP, SBFCA is requesting permission from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (Title 33 of the United States Code [USC], Section 408, [33 USC 408])—hereinafter referred to as *Section 408*—for the alteration of a levee as part of the Sacramento River Flood Control Project (SRFCP), a Federal work. USACE's authority to grant permission for the FRWLP under Section 408 triggers the requirement for USACE to comply with the National Environmental Policy Act (NEPA). The project is also subject to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, whose authorities also lie under USACE. A more detailed discussion of relevant laws, policies, plans, and regulations is included in Chapter 5, *Compliance with Applicable Laws, Policies, and Plans and Regulatory Framework*.

1.1 Document Purpose and Structure

1.1.1 Document Overview

This document is a ~~joint~~ Final EIS~~/EIR~~ and is intended to satisfy the requirements of NEPA ~~and the California Environmental Quality Act (CEQA)~~ for disclosing environmental effects and recommended mitigation measures related to a proposed project, and alternatives, prior to making a decision on project approval. Specifically, this document analyzes the FRWLP to support a NEPA Record of Decision (ROD)~~, and CEQA Notice of Determination (NOD).~~

~~The following information is provided in this section.~~

- ~~Background of NEPA and CEQA requirements.~~
- ~~NEPA and CEQA lead agency roles.~~
- ~~Use of a combined document for NEPA and CEQA compliance.~~
- ~~Use of NEPA and CEQA terminology.~~
- ~~Resource analysis structure.~~
- ~~Discussion of the vertical datum used in this document.~~

Overview of Changes to the Final EIS

This document is presented in two parts:

- Part I is the introduction, alternatives descriptions, discussion of the affected environment, discussion of the environmental effects, and supporting information from the Draft EIS/EIR,

revised, with revisions showing strikeouts for deletions and underline for insertions, based on comments received; and other necessary updates and corrections.

- Part II is the record of comments received and responses. Chapters 1 through 4 present the full comments and detailed responses, organized by public agencies or tribal governments; NGOs, or other organizations; individuals; and public hearings. Each comment has been considered and responded to individually.

Changes to Document

This EIS/EIR was initiated as a joint document with USACE involvement for Section 408 permission and as the lead NEPA agency, and with SBFCA as the project applicant and CEQA lead agency. The Draft EIS/EIR was written with joint NEPA and CEQA language to characterize the cooperation of the two agencies on the FRWLP. Since the release of the Draft EIS/EIR, the NEPA and CEQA processes have been separated and are now represented by a stand-alone EIS and a stand-alone EIR, respectively. It should be noted that the language in this EIS has not been modified to NEPA-only; it maintains the joint language used when environmental analysis was initiated on the FRWLP.

Additionally, the Draft EIS/EIR included a General Conformity Determination in Appendix D due to emissions associated with Alternative 2 that are in excess of the General Conformity *de minimis* thresholds, per the Clean Air Act. However, USACE and SBFCA have determined that Alternative 2 is not the preferred alternative and emissions associated with Alternative 3, the applicant-preferred alternative (APA), are below the applicable General Conformity *de minimis* thresholds. Therefore, the General Conformity Determination previously presented in the Draft EIS/EIR has been removed and is not included in the FEIS.

The following information is provided in this section.

- Background of NEPA and CEQA requirements.
- NEPA and CEQA lead agency roles.
- Use of a combined document for NEPA and CEQA compliance.
- Use of NEPA and CEQA terminology.
- Resource analysis structure.
- Discussion of the vertical datum used in this document.

1.1.2 NEPA and CEQA Requirements

The Council on Environmental Quality's (CEQ's) regulations for implementing NEPA specify that a Federal agency preparing an EIS must consider the effects of the proposed action and alternatives on the environment; these include effects on ecological, aesthetic, historical, and cultural resources as well as economic, social, and health effects. Environmental effects are categorized as direct, indirect, or cumulative. An EIS also must discuss possible conflicts with the objectives of Federal, state, regional, and local land use plans, policies, or controls for the area concerned; energy requirements and conservation potential; urban quality; the relationship between short-term uses of the environment and long-term productivity; and irreversible or irretrievable commitments of resources. An EIS must identify relevant, reasonable mitigation measures not already included in the proposed action or alternatives that could avoid, minimize, rectify, reduce, eliminate, or compensate

for the project's adverse environmental effects (40 ~~Code of Federal Regulations [~~CFR~~]~~ 1502.14, 1502.16, and 1508.8.).

The State CEQA Guidelines explain that the environmental analysis for an EIR must evaluate impacts associated with the project and identify mitigation for any potentially significant impacts. All phases of a proposed project, including construction and operation, are evaluated in the analysis. Section 15126.2 of the State CEQA Guidelines states:

> An EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, and human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected.

An EIR also must discuss inconsistencies between the proposed project and applicable general plans and regional plans (State CEQA Guidelines Section 15125[d]).

An EIR must describe any feasible measures that could minimize significant adverse impacts, and the measures are to be fully enforceable through permit conditions, agreements, or other legally binding instruments (State CEQA Guidelines Section 15126.4[a]). Mitigation measures are not required for impacts that are found to be less than significant.

1.1.2.1 NEPA Lead Agency

USACE is preparing this EIS for the purposes of compliance with NEPA due to its authority over alteration of Federal project levees. That authority, pursuant to Section 14 of the Rivers and Harbors Act of 1899 (33 USC 408), is commonly referred to as *Section 408 approval* and is the nexus for USACE's responsibility for NEPA compliance. Through that Federal nexus, NEPA and the CEQ's NEPA implementing regulations require Federal agencies to evaluate the environmental impacts of a proposed Federal action. In this case, USACE's decision to provide Section 408 approval to SBFCA (via CVFPB) is the Federal action that triggers USACE's designation as lead agency under NEPA. Furthermore, since SBFCA's FRWLP is not a USACE civil works project, USACE's responsibilities are limited to NEPA compliance, Section 408 approval, and compliance with other applicable laws such as the Endangered Species Act and National Historic Preservation Act, and consideration of future crediting based on the outcome of the Feasibility Study. USACE has no responsibilities for funding, design, or project implementation and construction.

USACE has further authority relative to the FRWLP under Section 10 of the Rivers and Harbors Act of 1899 for potential effects in, under, or over navigable waters and Section 404 of the Clean Water Act for potential placement of dredged or fill material in jurisdictional waters. This document executes NEPA compliance for all USACE project authorities.

1.1.2.2 CEQA Lead Agency

SBFCA is the lead agency and implementing agency preparing this EIR for the purposes of compliance with CEQA. Pursuant to Section 15126(d) of the State CEQA Guidelines, an EIR must describe and evaluate a reasonable range of alternatives that would feasibly attain most of the basic project objectives and would avoid or substantially lessen any significant impact of the project as proposed.

1.1.3 Application of NEPA and CEQA Principles and Terminology

NEPA and CEQA are similar in that both laws require the preparation of an environmental study to evaluate the environmental effects of proposed government activities. However, there are several differences between the two regarding terminology, procedures, environmental document content, and substantive mandates to protect the environment. For this environmental evaluation, the more rigorous of the two laws was applied in cases in which NEPA and CEQA differ.

Table 1-1 below compares the terminology of NEPA and CEQA for common concepts.

Table 1-1. Key to General NEPA and CEQA Terminology

NEPA Term	Correlating CEQA Term
Lead agency	Lead agency
Cooperating agency	Responsible agency
Environmental impact statement	Environmental impact report
Record of decision	Findings
Preferred alternative	Proposed project
Project purpose	Project objectives
No Action alternative	No project alternative
Affected environment	Environmental setting
Effect/impact	Impact

In some cases in this document, both NEPA and CEQA terminology are used, as in this chapter where the project purpose and need and project objectives are discussed. The terms *environmental consequences, environmental impacts,* and *environmental effects* are considered synonymous in this analysis, and *effects* is used for consistency. Similarly, in general, the terms *significant* and *less than significant* are used rather than *adverse* and *not adverse*.

Technical terms used in the EIS/EIR are typically defined in their first instance of use in the text. A list of acronyms and abbreviations precedes this chapter. An index follows Chapter 9.

1.1.4 Resource Analysis Structure

Chapter 3, *Affected Environment and Environmental Consequences*, contains the project-level analyses for the FRWLP, following the structure below.

- **Introduction.** This section introduces the scope of the resource analysis.
  - **Sources of Information.** This section lists the sources of information pertinent to the analysis of project impacts on this specific resource.
- **Affected Environment.** This section includes two sections, *Regulatory Setting* and *Environmental Setting*.
  - **Regulatory Setting.** This section summarizes laws, regulations, and policies that affect the resource or the assessment of effects on the resource. Often the regulatory framework is the basis for the conclusion of the level of significance and therefore plays a crucial role in effect assessment. Appendix A provides a more exhaustive description of potentially applicable regulations, including local policies from municipal general plans and ordinances.
  - **Environmental Setting.** This section provides an overview of the physical environmental conditions in the area at the time of or prior to the publication of the Notice of Preparation (NOP) that could be affected by implementation of the proposed alternatives in accordance with NEPA regulations (40 CFR 1502.15) and State CEQA Guidelines Section 15125.
- **Environmental Consequences.** This section describes the analysis of effects relating to each resource area for each of the alternatives in accordance with NEPA regulations (40 CFR 1502.16) and with State CEQA Guidelines Section 15126, 15126.2, and 15143.
  - **Assessment Methods.** This section describes the methods, models, process, procedures, data sources, and/or assumptions used to conduct the effect analysis. Where possible, effects are evaluated quantitatively. Where quantification is not possible, effects are evaluated qualitatively.
  - **Determination of Effects.** This section provides the criteria used in this document to define the level at which an effect would be considered significant in accordance with CEQA and adverse in accordance with NEPA. Significance criteria (sometimes called thresholds of significance) used in this EIS/EIR are based on the checklist presented in Appendix G of the State CEQA Guidelines; factual or scientific information and data; and regulatory standards of Federal, state, and local agencies. Under NEPA, preparation of an EIS is triggered if a Federal action has the potential to "significantly affect the quality of the human environment," which is based on the context and intensity of each potential effect. The significance thresholds used in this EIS/EIR also encompass the factors taken into account under NEPA to evaluate the context and the intensity of the effects of an action.
  - **Effects and Mitigation Measures.** To comply with NEPA and CEQA, effects are considered and evaluated as to whether they are direct, indirect, or cumulative. Direct effects are those that are caused by the action and occur at the same time and place. Indirect effects are reasonably foreseeable consequences to the physical environment that may occur at a later time or at a distance from the project area. Because direct and indirect effects are often interrelated, typically there is no distinction made between the two in the effects discussion. Cumulative effects for all resource areas are combined and discussed in Chapter 4, *Growth-Inducing and Cumulative Effects*.

Effects are listed numerically and sequentially throughout each section. An effect statement precedes the discussion of each effect and provides a summary of the effect topic. The numbering system provides a mechanism for tracking unique effects by resource area.

Each effect is accompanied by a finding or conclusion, as required under NEPA and CEQA. Table 1-2 provides a key for relating the effect findings by relative severity (increasing in degree of adversity to the environment).

Table 1-2. Key to Effect Findings (by Increasing Adversity)

Finding
Beneficial
No Effect
Less than significant
Significant
Significant and unavoidable

For the purposes of the analyses in this document, the effect findings are defined more specifically below.

- **Beneficial.** This effect would provide benefit to the environment as defined for that resource.
- **No Effect.** This effect would cause no discernible change in the environment as measured by the applicable significance criterion; therefore, no mitigation would be required.
- **Less than Significant.** This effect would cause no substantial adverse change in the environment as measured by the applicable significance criterion; therefore, no mitigation would be required.
- **Significant.** This effect would cause a substantial adverse change in the physical conditions of the environment. Effects determined to be significant based on the significance criteria fall into two categories: those for which there is feasible mitigation available that would avoid or reduce the environmental effects to less-than-significant levels and those for which there is either no feasible mitigation available or for which, even with implementation of feasible mitigation measures, there would remain a significant adverse effect on the environment. Those effects that cannot be reduced to a less-than-significant level by mitigation are identified as significant and unavoidable, described below.
- **Significant and Unavoidable**. This effect would cause a substantial adverse change in the environment that cannot be avoided or mitigated to a less-than-significant level if the project is implemented. Even if the effect finding is still considered significant with the application of mitigation, the applicant is obligated to incorporate all feasible measures to reduce the severity of the effect.
- **Mitigation Measures.** Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant effects accompany each effect discussion. Similar to the effect descriptions, mitigation measures are listed numerically and sequentially throughout each section. A mitigation measure statement precedes the

discussion of each measure and provides a summary of the measure topic. The numbering system provides a mechanism for tracking unique measures by resource area.

1.1.5 Elevation Datum Used in This Document

Elevations used in this document are referenced to the North American Vertical Datum of 1988 (NAVD 88) to the greatest extent feasible. It should be noted that many of the studies cited in the alternatives descriptions and analyses were originally conducted in the National Geodetic Vertical Datum of 1929 (NGVD 29) and have been converted where feasible. In some cases, such as where a figure has been borrowed from another study, the elevations have not been converted to preserve the integrity of the source study.

1.2 Setting and Study Area

The regional setting of the FRWLP is the SRFCP, beginning as far north as Redding, California, and extending south to the Sacramento–San Joaquin River Delta (Delta) (Plate 1-1). The regional setting is important relative to other flood risk reduction projects occurring within the SRFCP, namely USACE's Sutter Basin Feasibility Study, American River Common Features Project, West Sacramento Project, and Yuba Basin Project, and the non-Federally led Natomas Levee Improvement Program as well as other projects undertaken by the Sacramento Area Flood Control Agency (SAFCA), projects undertaken by the Three Rivers Levee Improvement Authority (TRLIA), and projects undertaken by the West Sacramento Area Flood Control Agency (WSAFCA) (Plate 1-2). These and other projects are described under Section 1.5, *Related Actions, Programs, and Planning Efforts*. For the analysis of effects (direct, indirect, or cumulative), the regional context of the SRFCP is taken into consideration.

Scoping down in regional setting, the Sutter Basin is part of the SRFCP, located in north-central California in Sutter and Butte Counties. The elongated, irregularly shaped basin covers about 326 square miles and is about 44 miles long north to south and up to 14 miles wide east to west. It is roughly bounded by the Feather River (to the east), Cherokee Canal, the Sutter Buttes, and Sutter Bypass (to the west, listed from north to south). Floodwaters potentially threatening the basin originate from the Feather River watershed or the upper Sacramento River watershed, above Colusa Weir. These waterways have drainage areas of 5,921 and 12,090 square miles, respectively. In addition to Yuba City, communities in the basin include Biggs, Gridley, Live Oak, and Sutter.

The project area for the FRWLP, a subset of the Sutter Basin described above, is focused on the corridor along the west levee of the Feather River from Thermalito Afterbay on the north to approximately 4 miles north of the Sutter Bypass on the south. This corridor is roughly 500 feet toward the land side of the existing levees and 100 feet toward the water side. This corridor was determined as the area in which levee improvements, such as seepage berms, stability berms, relief wells, setback levees, erosion protection, and slurry cutoff walls, are likely to occur. The corridor is approximately 41 miles long, divided into 41 relatively homogeneous reaches for ease of describing existing conditions, proposed actions, the affected environment, and potential environmental effects (note that this number is coincidental and one reach does not consistently correspond to a length of 1 mile; also, Reach 1 is not a part of the FRWLP), shown on Plates 1-3a and 1-3b. The project area would also include borrow/spoil sites or project mitigation sites outside of this corridor, as further described in Chapter 2, *Alternatives*. The reaches are listed in Table 1-3. Plates 1-4 through 1-10 show representative photos of the project area.

For the purposes of this document, the *study area* and *planning area* are considered the same, defined as the area within SBFCA's planning authority in which potential actions would occur and where environmental effects are likely to occur. The *project area* is defined as the area in which potential actions (i.e., alternatives) would occur. The *affected area* is defined as the location of resources that would be directly, indirectly, or cumulatively affected by the project alternatives.

Table 1-3. Summary of Study Reaches

Reach	Beginning Station	Ending Station	Length (feet)	Landmarks	Dominant Adjacent Land Uses
1	0+00	202+50	Not part of the project proposed at this time.		
2	202+50	218+66	1,616		Ruderal grassland; open space
3	218+66	300+66	8,200	Cypress Avenue	Ruderal grassland; open space
4	300+66	410+67	11,001	Central Street; Wilkie Avenue	Orchard; ruderal grassland; riparian forest
5	410+67	478+68	6,801	Wilkie Avenue	Orchard
6	478+68	510+37	3,169	Star Bend	Orchard
7	510+37	596+00	8,563	Abbott Lake	Ruderal grassland; open space
8	596+00	654+75	5,875		Ruderal grassland; open space
9	654+75	706+50	5,175	Boyd's Boat Launch; Nursery	Ruderal grassland; open space
10	706+50	774+00	6,750	Barry Road	Ruderal grassland; open space
11	774+00	830+00	5,600		Ruderal grassland; open space
12	830+00	845+00	1,500	Shanghai Bend	Ruderal grassland; open space
13	845+00	927+00	8,200		Ruderal grassland; open space
14	927+00	954+40	2,740	Airport	Ruderal grassland; open space
15	954+40	968+50	1,410	Airport	Developed; ruderal grassland
16	968+50	1080+00	11,150	Garden Highway, 2nd Street; Twin Cities Memorial Bridge; Colusa Avenue	Developed; ruderal grassland
17	1080+00	1130+86	5,086	Live Oak Boulevard; Union Pacific Railroad	Developed; ruderal grassland
18	1130+86	1213+85	8,299	Live Oak Boulevard; Union Pacific Railroad; Rednall Road	Orchard
19	1213+85	1297+83	8,398		Orchard
20	1297+83	1374+33	7,650		Orchard; ruderal grassland
21	1374+33	1433+83	5,950		Ruderal grassland
22	1433+83	1503+83	7,000		Riparian forest; ruderal grassland
23	1503+83	1609+37	10,554		Orchard
24	1609+37	1623+86	1,449		Riparian forest; ruderal grassland
25	1623+86	1674+37	5,051		Orchard; ruderal grassland
26	1674+37	1707+11	3,274		Orchard
27	1707+11	1721+60	1,449		Ruderal grassland
28	1721+60	1769+31	4,771		Orchard
29	1769+31	1813+33	4,402		Orchard; riparian forest
30	1813+33	1902+00	8,867		Orchard
31	1902+00	1958+00	5,600		Orchard; ruderal grassland

Reach	Beginning Station	Ending Station	Length (feet)	Landmarks	Dominant Adjacent Land Uses
32	1958+00	1989+00	3,100		Orchard
33	1989+00	2122+00	13,300		Orchard
34	2122+00	2182+00	6,000		Orchard
35	2182+00	2224+00	4,200		Orchard; ruderal grassland
36	2224+00	2259+00	3,500		Orchard; ruderal grassland
37	2259+00	2290+00	3,100		Orchard; ruderal grassland
38	2290+00	2303+00	1,300		Ruderal grassland
39	2303+00	2319+00	1,600		Ruderal grassland
40	2319+00	2359+00	4,000		Ruderal grassland
41	2359+00	2368+00	900	Thermalito Afterbay	Ruderal grassland

Note: Certain planning and engineering studies for the project make reference to segments within the planning area under which the reaches above are grouped. These segment designations do not have substantial bearing on the alternatives descriptions, environmental setting, or determination of effects and therefore are not used in this document for simplicity.

1.3 Project Background

1.3.1 Flood Management History

Prior to European settlement in the mid-19th century, the floodplain of the Sacramento River in the 150 miles between the city of Redding and the Delta varied from 2 to 30 miles wide and annually covered more than 1 million acres. Low, discontinuous levees were built by individual landowners from the 1840s to the 1890s. Those levees concentrated floodflows and contributed to problems that were worsened by upstream hydraulic mining in the Sierra Nevada foothills in the late 1800s.

The SRFCP was authorized by Congress in 1917 as the first Federal ~~flood control~~flood risk management project outside the Mississippi River Valley and was the major project for ~~flood control~~flood risk management on the Sacramento River and its tributaries. The non-Federal sponsor was the Reclamation Board of the State of California (Reclamation Board, reauthorized in 2007 as the CVFPB). With the authorization of the SRFCP, USACE and the State of California began managing the project as a regional system, constructing improvements to approximately 1,100 miles of levees and creating bypasses and floodways. Additional information is provided in the environmental setting discussion of Section 3.1, *~~Flood Control~~Flood Risk Management and Geomorphic Conditions*.

Although the ~~flood control~~flood risk management structures have been extensively improved and upgraded since construction, the underlying foundation of most of the levees and channels pre-dates any state or USACE involvement and still retains the original materials that include dredged riverbed sands, soil, and organic matter. At the time of the SRFCP authorization in 1917, the areas being protected by the levees were primarily agricultural with minimal improved infrastructure such as railroads and highways. Today, the area remains largely agricultural with population centers including Yuba City, Biggs, Gridley, Live Oak, and Sutter.

The Federal government maintains oversight but has no ownership of or direct responsibilities for performing maintenance of the Federal levee system, except for a few select features that continue

to be owned and operated by USACE. Considering these exceptions, the great majority of levees, channels, and related ~~flood control~~flood risk management structures are owned, operated, and maintained by the State of California and local levee and reclamation districts as governed by USACE ~~operations and maintenance (~~O&M~~)~~ manuals. Most of the levee and reclamation districts existed prior to the SRFCP authorization in 1917 and have been carrying out maintenance responsibilities. Today, many of the levee districts are substantially underfunded and unable to maintain the system to meet current Federal standards. The levees in the planning area are maintained by LD 9; DWR's Maintenance Areas (MAs) 3, 7, and 16; and LD 1. The May 1955 Standard Operations & Maintenance Manual for the Sacramento River Flood Protection Project is the primary O&M manual for the area, in addition to four supplemental manuals completed in August 1955 that cover the area from Western Canal Intake (Thermalito Afterbay) to the Sutter Bypass. Two additional supplements were prepared for habitat mitigation, one in 2003 for seven sites in or near the study area and one in 2011 for the Star Bend project (described below). MA 3 is responsible for the lowermost reaches of the project area, followed by LD 1, LD 9, MA 16, and MA 7 from south to north.

In addition to the SRFCP levee system, two major flood management reservoirs are located within the Feather River watershed. Oroville Dam and reservoir (Lake Oroville) were constructed on the Feather River in 1967 as an element of the California State Water Project. The reservoir has 3,358,000 acre-feet of storage with 750,000 acre-feet of dedicated flood management space. New Bullards Bar Dam and reservoir were constructed on the Yuba River in 1970 by the Yuba County Water Agency. The reservoir has 966,000 acre-feet of storage with 170,000 acre-feet of dedicated flood management space.

A notable milestone in improving the local levee system was construction of a 3,000-foot setback levee at Star Bend on the Feather River West Levee in 2009. Located about 10 miles south of Yuba City and north of the Sutter Bypass confluence, this project is within the FRWLP project area, and the proposed FRWLP activities would adjoin the new setback levee upstream and downstream. LD 1 is the local maintaining agency and was the project proponent and owner, with major funding from the State of California through Propositions 1E and 84, as well as LD 1, Calpine Corporation, Sutter County, and the City of Yuba City. The new levee was built to current standards and included a slurry cutoff wall for under-seepage protection. The old levee was degraded, and the new expanded floodplain is an ecosystem restoration site with surplus area available intended to provide for habitat mitigation for the FRWLP.

Major flood events occurred along the Feather River in 1955, 1958, 1964, 1986, 1997, and 1998. Of these, the more significant events that caused levee failures and flooding of the Sutter Basin and surrounding areas were in 1955, 1986, and 1997. In December of 1955, the most significant flood event along the Feather River is reported to have occurred. Several levee embankment failures caused major flooding of nearly all of Yuba City as well as flooding in Nicolaus. Approximately 156 square miles were flooded during this event. In February of 1986, heavy snow pack and warm rains elevated water levels and caused a levee embankment failure on the adjacent segment of the Yuba River near Linda, flooding nearly 30 square miles including Linda and Olivehurst, causing a fatality and an estimated $20 million in damages (1986 dollars). Over the new-year transition from 1996 to 1997, heavy snow pack and warm rains again elevated water levels. All citizens in Yuba City, Marysville, Linda, and Olivehurst were ordered to evacuate. Ultimately, in January of 1997, a levee embankment failure occurred south of Olivehurst flooding nearly 50 square miles including Olivehurst and Arboga, causing four fatalities and an estimated $41 million in damages (1997 dollars). (HDR et al. 2011.)

Over that past two decades, several studies have been conducted by USACE, DWR, or SBFCA to evaluate the condition of the levees protecting the planning area relative to criteria for stability, seepage, erosion, geometry, and levee height. These studies have indicated that the levee system is deficient and that the consequences of levee failure from a major flood event would be significant (described under the No Action Alternative in Chapter 2). Specifically, as a result of knowledge gained from its regional comprehensive study (the Sacramento–San Joaquin River Basins Comprehensive Study, also known as the Comp Study) initiated after the 1997 flood, USACE revised its levee criteria regarding through-seepage and under-seepage, problems known to exist within the SBFCA levee system (U.S. Army Corps of Engineers and the Reclamation Board for the State of California 2002).

Further evaluation has demonstrated that much of the existing system does not provide protection from the 100-year flood event, the commonly accepted minimum level of ~~flood protection~~performance per the Federal Emergency Management Agency's (FEMA's) National Flood Insurance Program (NFIP), as well as being less than the 200-year level targeted by the State of California for urban areas. In addition, an emergency preparedness mapping study analyzed hypothetical levee failures and determined the rate and depth at which water would flood SBFCA's planning area if a levee failure occurred in the studied reaches; this study predicted flooding depths that could range from about 1 foot to more than 20 feet in some areas.

According to records from the local maintaining agencies (MAs and LDs) compiled by the SBFCA engineering team, there have been more than 125 observed levee performance problem locations in the project area since 1955. These problems include seepage, boils, erosion, boils, breaks, and cracks. This accounting includes the catastrophic floods of 1955, 1986, and 1997.

1.3.2 Overview of Levee Failure Mechanisms and Deficiencies

As discussed above, USACE, DWR, and SBFCA have commissioned studies to determine the type, location, and severity of deficiencies in the SBFCA flood management system. In simple terms, floods typically occur from levee failure mechanisms and deficiencies such as when one of the following events occurs.

- Water moves through the levee structure (through-seepage).
- Water moves under the levee structure (under-seepage).
- Levee slopes are overly steepened or levees have inadequate section to resist floodwaters or other forces (slope stability and geometry).
- Water carries soil away from the levee slope (erosion).
- Vegetation and other encroachments, such as structures, impede levee O&M (non-compliant vegetation and levee encroachments).

These failure mechanisms and deficiencies are more fully described below, preceded by a table of the deficiencies by reach (Table 1-4). Plate 1-11 illustrates levee seepage and Plate 1-12 illustrates other typical deficiencies.

Note: Additional information on the deficiencies can be found in a pre-design formulation report (HDR et al. 2011). The deficiencies and alternatives have been refined and focused through progressive stages in the planning process to form the basis of the purpose, need, objectives, and proposed activities that are the foundation of the EIS/EIR; and, therefore, may differ slightly among these documents.

Table 1-4. Summary of Levee Deficiencies by Reach

Study Reach	Through-Seepage[a]	Under-Seepage[b]	Slope Stability[c]	Erosion	Encroachments
1	Not part of the project proposed at this time.				
2	X	X	*		X
3	X	X	*		X
4	X	X	*		X
5	X	X	*		X
6					
7	X	X	*		X
8	X	X	*		X
9	X	X	*		X
10	X	X	*		
11	X	X	*		X
12					
13	X	X	*		
14					
15	X	X	*		X
16			X	X	X
17	X	X	*		X
18	X	X	*		X
19	X	X	*		X
20		X	*		X
21		X	*		X
22	X	X	*		X
23		X	*		X
24		X	*		X
25					
26	X	X	*		X
27	X	X	*		X
28		X	X		X
29					
30	X	X	*		X
31		X	X		X
32	X	X	*		X
33	X	X	*		X
34	X	X	*		X
35	X	X	*		X
36	X	X	*		X
37	X	X	*		X
38	X	X	*		X
39					
40	X	X	*		X
41	X	X	*		X

Source: HDR et al. 2011.

Notes: An X signifies the levee deficiency applies to the levee reach.

[a] Through-seepage issues based on phreatic surface existing on the landside slope.

[b] Under-seepage issues based on exit gradient greater than 0.5 at the landside levee toe.

[c] An * signifies areas where through- and under-seepage issues exist and slope stability was not independently verified.

1.3.2.1 Through-Seepage

Through-seepage occurs when water moves outward from the river channel through the levee cross section (Plate 1-11). The key problem associated with through-seepage is levee breach or collapse, which occurs when the earthen material within the levee is transported by the pressure of the seeping water. Soil piping can also occur as the result of seepage. Soil piping is when a hole in a levee becomes exploited by moving water (which naturally seeks the path of least resistance), causing the hole to increase rapidly and threaten the levee integrity. Several factors contribute to through-seepage, including high water pressure (such as during periods of high water in the river or bypass), and pervious earth material (i.e., sandy soils) within or underlying the levee.

1.3.2.2 Under-Seepage

Similar to through-seepage, under-seepage occurs when water moves outward and downward from the river channel below the levee and surrounding land surface (Plate 1-11). The key problem with under-seepage occurs when the earth particles which compose the levee foundation are transported from underneath the levee due to the pressure of the seeping water. This undermining of the levee may result in levee instability or collapse. As with through-seepage, soil piping may occur and cause the levee to breach or collapse, threatening overall levee integrity. Evidence of under-seepage can often be seen as boils on the land surface on the landward side of the levee. The factors that contribute to under-seepage are the same as those discussed above in through-seepage.

1.3.2.3 Slope Stability

Slope stability is a desirable quality and refers to the resistance of the levee slope to change (landside or waterside). A slope that has an unfavorable horizontal to vertical ratio can be unstable and vulnerable to slipping or sloughing, exacerbated by high flood water elevations. Generally, the approach to determining slope stability can be divided into two categories: steady state and rapid drawdown. Steady state assumes that the flood-stage water surface is present for a significant duration, and the presence of water in the levee and the weakening of the levee interior due to through-seepage can cause the landside slope of the levee to slip and wash away. Rapid drawdown also assumes that the flood-stage water surface is present for a significant amount of time, and then is removed quickly as if the river were drained. The water remaining within the levee section weakens the integrity of the levee and when the water surface drops, the waterside slope is vulnerable to slipping and washing away.

1.3.2.4 Erosion

Erosion is the loss of levee material typically from the force of flowing water, which may be exacerbated by high water velocities, waves, wind action, and boat wake. The high variability in levee soil material, water surface elevation, flow velocities, and relationship of the levee to the active channel results in commensurate variation in the point at which the levee is at risk (e.g., at lower flows, the levee toe is at risk to erosion; at high flows, the levee face may be at risk).

1.3.2.5 Levee Encroachments

Federal project levees, like those on the Feather River, are subject to USACE O&M standards. These standards are outlined in general policies and technical publications that universally apply to all Federal project levees and in project-specific O&M manuals. Recent general guidance from USACE provides greater specificity for the location, type, and degree of encroachments and vegetation

allowable on or near levees. USACE has a levee vegetation policy, detailed in *Engineering Technical Letter 1110-2-571, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* (ETL), which generally prohibits woody vegetation within the levee prism or within 15 feet of the landside or waterside levee toes (U.S. Army Corps of Engineers 2009).

Under certain circumstances, encroachments and vegetation can exacerbate local erosion (factoring stage, discharge, and bank configuration, single trees, or other encroachments can affect near-bank velocities such that localized scour could occur), limit the ability to observe levee performance, impair O&M practices, and otherwise affect levee integrity. Encroachments may include penetrations (e.g., pipes, conduits, and cables), power poles, pump stations, retaining walls, or similar features.

It should be noted that not all encroachments or non-compliant vegetation in the project area would be addressed by the FRWLP. The FRWLP is primarily targeted at addressing known geotechnical deficiencies (such as seepage and slope stability), which are generally regarded as posing the most substantial risk to levee failure and flooding. Unlike some other areas of the Central Valley (such as much of the Sacramento River) the Feather River West Levee is largely ETL-compliant in its current condition because of local O&M practices and because the levee is considerably distant from the active channel of the Feather River, allowing for floodplain habitat that does not encroach on the levee. Therefore, as part of the FRWLP, SBFCA proposes to remove only that vegetation that is in the direct disturbance footprint of the project for constructing levee improvements to address other deficiencies. SBFCA is working cooperatively with the State of California and USACE for a long-term solution to address other non-compliant vegetation and encroachments, and, because Section 408 permission does not require ETL compliance outside of the disturbed areas, any future activity for ETL compliance is not part of the FRWLP nor is a variance being requested at this time. However, all vegetation will be removed from within the FRWLP construction footprint under all action alternatives, and will not be replaced in a manner that does not comply with the ETL.

Long term beyond the FRWLP, SBFCA supports and has an ultimate goal toward woody vegetation management consistent with the CVFPP, which proposes that levees with preexisting woody vegetation would be managed according to levee vegetation inspection criteria. That long-term CVFPP vegetation management strategy is defined below.

The inspection criteria establish a vegetation management zone in which trees are trimmed up to 5 feet above the ground (12-foot clearance above the crown road) and thinned for visibility and access. Brush, weeds, or other such vegetation over 12 inches high are to be removed in an authorized manner. The vegetation management zone includes the entire landside levee slope plus 15 feet beyond the landside toe (or less, if the existing easement is less than 15 feet), the levee crown, and the top 20 feet (slope length) of the waterside levee slope.

Waterside vegetation below the vegetation management zone should remain in place without trimming or thinning, unless it poses an unacceptable threat to levee integrity.

The CVFPP proposes a long-term, adaptive, vegetation life-cycle management (LCM) plan that would lead to the eventual elimination of trees and other woody vegetation through removal of immature trees and woody vegetation. LCM would be implemented in the vegetation management zone, as described above.

This plan would allow existing “legacy” trees and other woody vegetation beyond a certain size to live out their normal life cycles on the levee, unless they pose an unacceptable threat. Under the LCM

plan, removing immature trees and woody vegetation less than 4 inches in diameter at breast height would be conducted in consultation with the appropriate resources agencies.

Per the draft Urban Levee Design Criteria (ULDC) (California Department of Water Resources 2012), before any tree removal, an engineering inspection and evaluation should be conducted to identify trees and woody vegetation (alive or dead) that pose an unacceptable threat to the integrity of the levee.

1.3.2.6 Levee Height

Levee height is not a deficiency in the planning area. The levees on the Feather River were substantially built prior to construction of Lake Oroville, a major reservoir upstream on the river. The effect of Lake Oroville is that it at least partially attenuates flows in the watershed, resulting in lower water surface elevation in the river during peak flows than it would be without the reservoir. Therefore, because the levee heights in the project area were determined prior to construction of the reservoir and designed for a higher water surface elevation in the river than current conditions, levee height is not a deficiency in the project area.

1.3.3 Formation of SBFCA and Development of the FRWLP

Currently, there are several major flood risk-reduction projects being planned or implemented within the SRFCP area (Plate 1-2), discussed in further detail under Section 1.5, *Related Actions, Programs, and Planning Efforts*.

SBFCA was formed in 2007 to take a proactive rather than reactive stance with respect to flood risk reduction specific to the Sutter Basin area. At that time, FEMA was revising its Flood Insurance Rate Maps (FIRMs) in the study area through a nationwide program entitled RiskMAP (mapping, assessment, and planning) that would likely lead to the study area being mapped within the 100-year floodplain. This would make flood insurance mandatory for all Federally guaranteed loans and restrict development. SBFCA concluded that it was necessary to perform a comprehensive evaluation of the Feather River West Levee to determine the current level of ~~flood protection~~performance based on current engineering criteria, determine the magnitude and severity of any deficiencies, and develop recommended strategies for improvement.

As introduced previously, specific levee deficiencies along the Feather River West Levee are through-seepage, under-seepage, erosion, levee instability, and encroachments. There are also improvement needs for long-term O&M of the flood management corridor. The FRWLP as proposed by SBFCA will address these deficiencies and needs for that portion of the perimeter of the planning area to assist in incrementally reducing local flood risk.

In addition, other factors prompted SBFCA to embark on the FRWLP.

- State of California Senate Bill (SB) 5 (signed by Governor Schwarzenegger in October 2007 and enacted as California Water Code Sections 9600 through 9603, 9610 through 9616, and 9620 through 9625) requires 200-year ~~flood protection~~level of performance for urban areas by the year 2025. The time and effort required to fully evaluate approximately 41 miles of levees, develop recommended measures, and implement those measures prompted action without further delay.
- The Federal authorization and appropriation process to approve funding and begin evaluation can be lengthy. Through the civil works process, a feasibility study is being conducted by USACE

and its non-Federal sponsors for the Sutter Basin Feasibility Study. SBFCA is serving as a non-Federal sponsor for this effort in coordination with CVFPB. The feasibility study is more fully described in Section 1.5.2. In light of these circumstances, SBFCA launched the FRWLP in a parallel process to address urgent needs. SBFCA would construct the FRWLP in advance of USACE's project being studied under the Sutter Basin Feasibility Study. In combination, the FRWLP and actions under the Sutter Basin Feasibility Study would comprehensively address the deficiencies and needs for flood risk reduction for the entire planning area.

In July 2010, SBFCA formed an assessment district to raise local funds for levee improvements and repairs from property owners. The majority of funding to improve the levees will be obtained through state and local assistance; Federal crediting is being pursued. The property owners recognized the flood risks and indicated their willingness to participate in improvements by voting to approve an annual parcel assessment in 2010. This funding source facilitated SBFCA's advancement of the FRWLP.

1.4 Project Purpose, Objectives, and Need

1.4.1 Project Purpose

SBFCA's goal is to achieve a minimum of 200-year ~~flood protection~~level of performance for the more urbanized areas with population centers (as mandated by SB 5) and 100-year for the remaining more rural, agricultural parts of the planning area. A 200-year flood is a flood that has a 0.5% chance of occurring in any given year, also referred to as a 0.5% annual exceedance probability (AEP). A 100-year flood has a 1% AEP. The target of 100-year protection for the more rural, agriculture parts of the planning area, specifically the southern portion of the basin downstream of Yuba City, is driven by the goal to maintain viability and sustainability of agriculture by avoiding FEMA restrictions that would hinder construction or upgrade of agricultural infrastructure (such as farm residences, barns, silos, dryers, seasonal worker housing) and supporting businesses.

The primary purpose of the FRWLP is to reduce flood risk for the entire planning area by addressing known levee deficiencies along the Feather River West Levee from Thermalito Afterbay downstream to approximately 4 miles upstream of the confluence with the Sutter Bypass. While the FRWLP would not by itself reduce all flood risks affecting the planning area, it would address the most immediate risk based on the following.

- The proximity of the Feather River to population centers and key infrastructure.
- The nature of Feather River West Levee being the longest and most contiguous portion of the planning area perimeter.
- The location of known levee deficiencies and the clarity and feasibility of available measures to address them.

Future projects~~phases~~ may be implemented by SBFCA in coordination with the State of California and USACE based on available funding, the outcome of the Sutter Basin Feasibility Study, and implementation of the Central Valley Flood Protection Plan (CVFPP) and other flood management programs (or multi-objective programs that include flood management; see below under *Project Objectives*).

1.4.2 Project Objectives

The following objectives provide additional detail in support of the project purpose above.

- Protect existing populations and minimize exposure to flooding for agricultural commodities, infrastructure use, and other property.
- Reduce flood risk from Feather River toward a target of 200-year protection for Yuba City and to the north of the planning area and 100-year protection south of Yuba City, in compliance with SB 5 mandates for 200-year protection for urbanized areas and in avoidance of FEMA restrictions that would compromise agricultural sustainability.
- Address known deficiencies and observed performance issues.
- Construct a project as soon as possible to reduce flood risk as quickly as possible.
- Construct a project that is economically, environmentally, politically, and socially acceptable.
- Facilitate compatibility with the CVFPP and Sutter Basin Feasibility Study such that proposed activities would be "no regrets" and not inconsistent with any future plans.
- Facilitate compatibility with recreation and restoration goals in the planning area and incorporate multiple benefits in addition to flood-risk reduction, such as fish and wildlife habitat and recreation.

In regard to this last objective, SBFCA has identified several multi-benefit floodplain actions targeted at floodplain habitat restoration in combination with flood management. These actions are not part of the project analyzed in this EIS/EIR and would require separate analysis. SBFCA seeks to partner with other public agencies and environmental organizations to implement these actions.

1.4.3 Need for Action

Four needs have been identified for action.

- Study results from levee evaluations have shown that the Feather River West Levee needs improvements to reduce the current level of risk to human health, safety, property, and the adverse economic effect that serious flooding would cause.
- Study results have further shown that the levees in SBFCA's planning area, and, specifically, that on the west of the Feather River, are deficient when compared against current Federal and state standards.
- Improvements are necessary to meet FEMA's minimum acceptable level of ~~flood protection~~performance (commonly referred to as the 100-year flood) as specified by the NFIP. Draft revised FEMA maps show that all or parts of SBFCA's planning area may not meet 100-year flood standards. SBFCA intends to incrementally reduce risk to meet or exceed the FEMA standards.
- As mandated by SB 5, the CVFPB will require a 200-year level of ~~flood protection~~performance for urban areas by the year 2025 and calls for building and development limitations after 2015 if adequate progress towards achieving this standard is not met. Improvements to the Feather River West Levee are necessary to meet that requirement.

To further demonstrate the need for action, details about flood risk in SBFCA's planning area and the consequences of levee failure are described in Chapter 2, *Alternatives*. Some of the key infrastructure and facilities in study area that are at risk for flooding are listed in Table 1-5.

Table 1-5. Key Infrastructure and Facilities in SBFCA's Planning Area

Police	
California Highway Patrol (Yuba City)	Yuba City Police Department
Gridley/Biggs Police Department	U.S. Air Force Police
Marysville Police Department	
Fire	
Biggs Fire Department	Oswald-Tudor Fire Department
East Nicolaus Fire Department	Solon Fire Control
Feather River Surgery Center	
Gridley Fire Department	Sutter County Fire Department (Live Oak, CA)
Linda Fire Department	Sutter County Fire Department (Sutter, CA)
Live Oak Fire Department	Walton Fire Department (Clark Avenue)
Marysville Fire Department	Walton Fire Department (Butte House Road)
Northtree Fire International	Yuba City Fire Department
Emergency	
Ambulance Service Bi-County	Peach Tree Clinic Inc.
American Red Cross of Northeastern California	Phillips Lifeline Inc.
Biggs-Gridley Memorial Hospital	Rideout Memorial Hospital (Marysville)
California Emergency Physicians	Sutter North Urgent Care
Families First Urgent Care and Weight Loss Center	Rideout Memorial Hospital (Gridley)
Fremont-Rideout Urgent Care Center	Yuba County Emergency Services
Marysville Immediate Care	Yuba Sutter Call Center
Transportation	
Sutter County Airport	
Energy Companies	
Calpine Corporation	Yuba City Energy Center
~~The~~ Pacific Gas and Electric Company (PG&E)	
Agricultural Labs	
Boeger Bros Rice Dryer	Sutter Rice Co
Rice Experiment	
Agricultural Packing	
Feather River Packing	Sunrise Kiwi Packing (Biggs)
Golden Valley Fruit Packing	Sunrise Kiwi Packing (Gridley)
Gridley Packing Inc.	Sunsweet Growers, Inc.
Packing Shed LLC	Valley View Packing Co
Rio Pluma Co LLC	Wilbur Packing Co Inc.
Sacramento Packing Inc. (Tudor Road)	Wil-Ker-Son Ranch & Packing Co
Sacramento Packing Inc. (Lorraine Way)	

1.5 Related Actions, Programs, and Planning Efforts

This section provides an overview of other flood management activities that compose the regional planning context. Whereas the previous section provides historical background, the following section includes current and future actions which may be considered as part of the cumulative effects analysis.

1.5.1 System-Wide Efforts

Related current and future efforts affecting the entire SRFCP (or beyond) are described below.

1.5.1.1 Central Valley Flood Protection Act

The Central Valley Flood Protection Act (CVFPA), enacted in California in 2009, called for DWR to prepare the CVFPP, which was adopted by the CVFBP in June 2012. The CVFPP provides a comprehensive framework for system-wide flood management and flood risk reduction in the Central Valley. The CVFPA also establishes a new standard of 200-year ~~flood protection~~level of performance for urban areas in the Central Valley and requires this standard to be achieved by 2025.

The CVFPP presents three preliminary approaches for addressing current challenges and affordably meeting the CVFPP goals. The State has assembled what it views as the most promising, affordable, and timely elements of the three preliminary approaches into the State Systemwide Investment Approach (SSIA), which provides guidance for future State participation in projects and programs for integrated flood management in the Central Valley. Improvements proposed in the SSIA that could influence, or be influenced by, the FRWLP, include the following.

- **Sutter Bypass Expansion.** The CVFPP recommends increasing the capacity of the Sutter Bypass to convey large flood events. Expansion would likely require building a new levee for about 15 miles along one side of the bypass to widen the bypass for increased flow capacity. Although the required width of the bypass has not been determined, DWR used a 1,000-foot increase in the bypass width for planning purposes. The evaluations for planning purposes were initially based on 75% of the new width allocated to agricultural use and 25% allocated to habitat restoration.
- **Fish Passage Improvements.** The SSIA includes plans to improve fish passage at flood diversions, flashboard dams, and flood management structures. This includes connecting fishery habitat from the Delta to the Yolo and Sutter Bypasses and to the Butte Basin. These actions would assist in increasing and improving habitat connectivity and promoting the recovery of anadromous fish populations.

The CVFPB removed the Feather River Bypass from the CVFPP, as originally proposed by DWR. The proposed bypass would require construction of about 16 miles of new levee on one side of the Cherokee Canal. However, the bypass may be brought forward in the 2017 update of the CVFPP after further technical review with stakeholder and public engagement. Regardless, analysis performed by SBFCA discloses that the proposed bypass does not significantly reduce the need for FRWLP or modify the proposed remedial measures.

The people of California passed two bond measures (Propositions 84 and 1E) that provide approximately $5 billion toward flood improvements to reduce flood risk, particularly to state-

Federal levees protecting urban areas in the Central Valley. These levee improvements are expected to be made over the 10 years following authorization of the bonds in 2006. However, there were urgent needs to improve inadequate ~~flood protection~~level of performance in existing urban areas in advance of the overall comprehensive effort. These advance efforts are termed early implementation projects (EIPs). EIPs can be implemented ahead of and in parallel with the comprehensive effort as long as they are designed to ensure that they do not eliminate opportunity or prejudice future flood risk-management alternatives that would provide regional or system-wide benefits. Local agencies and the State are identifying and planning EIPs in a parallel process to be compatible with comprehensive, system-wide studies. Several EIPs have been implemented, such as those under the programs of SAFCA and WSAFCA.

Along with the requirement for increased ~~flood protection~~level of performance by 2025, one of the objectives of the CVFPP is:

> increasing the engagement of local agencies willing to participate in flood protection, ensuring a better connection between state flood protection decisions and local land use decisions (Draft Framework for Early Implementation Projects and Section 408 Approval).

In line with that objective, SBFCA has proposed the FRWLP as an EIP.

1.5.1.2 Sacramento River Flood Control System Evaluation

Following the flood of 1986, USACE and the State of California, along with local partners, completed a comprehensive evaluation of the SRFCP and initiated a flood risk management program aimed at repairing, raising, and strengthening urban levees, among other activities. This effort, known as the Sacramento River Flood Control System Evaluation (commonly referred to as System Evaluation) resulted in the repair of more than 70 miles of deficient levees by USACE. However, to date, not all the authorized repairs have been completed. Moreover, the completed repairs were built to standards in place at the time and which are no longer current.

Due to the large scale of the evaluation, the review was split into five phases. The results were published in the Sacramento River Flood Control System Evaluation, Phase II-V, Programmatic EIS/EIR, dated May 1992. Phases I and II evaluations include the Sacramento urban area and Marysville/Yuba City area. Phase III is the Mid-Valley area in and around the town of Knights Landing, approximately 27 miles northwest of Sacramento. Phase IV and V includes the lower Sacramento River area south of Sacramento and the upper Sacramento River area north of Knights Landing. According to the November 2002 SRFCP Limited Reevaluation Report (LRR), Phase VI was more recently added to evaluate additional potential sits in all phases, but its supplemental design memorandum had not been completed at that time.

Phase III is the only currently active phase and is being designed for dike slurry wall work at three sites along the right bank of the Sacramento River (River Mile [RM] 84.1 to 87.2). The work also involves dike reconstruction, with final design being recently completed, at three sites along the left bank of the Knights Landing Ridge Cut. The State of California is proposing to complete the Knights Landing Ridge Cut work under an EIP or USACE would complete all work in 2015–2016.

1.5.1.3 Sacramento–San Joaquin River Basins Comprehensive Study and Central Valley Integrated Flood Management Study

Following the 1997 flood, the ~~Sacramento–San Joaquin River Basins Comprehensive Study (~~Comp Study~~)~~ was initiated by the State and USACE to formulate comprehensive plans for flood risk

reduction and environmental restoration. This study was unable to stimulate widespread public or political interest in flood risk reduction or environmental restoration activity beyond the ongoing urban levee improvement programs. The study did result in a new set of engineering criteria for the design and evaluation of urban levees and a greatly expanded scope and cost for the ongoing urban levee improvement efforts on the Sacramento and American Rivers. In addition, the adequacy of previous repairs was reviewed.

Presently, the Central Valley Integrated Flood Management Study (CVIFMS) is a continuation of the Comp Study in which USACE and the State are defining a long-range program for the Sacramento and San Joaquin River Basins and the corresponding level of Federal participation. This program will identify opportunities to reduce flood risk by improving the flood capacity of the system while restoring and protecting floodplain and environmental features including wetlands and other fish and wildlife habitat. The approaches and management strategies under CVIFMS include the following.

- Conduct a watershed study to provide long-term reduction of flood risk and environmental restoration needs.
- Coordinate closely with the CVFPP development to produce joint products for mutual benefits and use.
- Provide leadership in specific disciplinary areas to ensure consistency in national management directives and guidelines.
- Coordinate with ongoing projects and programs to incorporate relevant information and actions in the study development.

Subject to continued appropriation, USACE plans to complete the CVIFMS by 2017.

1.5.1.4 Sacramento River Bank Protection Project

USACE is responsible for implementation of the Sacramento River Bank Protection Project (SRBPP) in conjunction with its non-Federal partner, CVFPB. The SRBPP is a continuing construction project authorized by Section 203 of the Flood Control Act of 1960. The purpose of this project is to provide protection from erosion to the existing levee and ~~flood control~~flood risk management facilities of the SRFCP. To date, work has been carried out in two phases. Phase I consisted of 435,000 feet and Phase II's original authorization included 405,000 feet. An additional 80,000 feet (a supplement to Phase II) has been authorized under the Water Resources Development Act (WRDA) of 2007 and is being supported by a Post Authorization Change Report, Engineering Documentation Report, and EIS/EIR under development. This authorization would be applied by USACE to the Feather River and other sites within the SRFCP that are identified as critical levee erosion sites. Further description of the SRBPP is provided in the environmental setting discussion of Section 3.1, ~~*Flood Control*~~*Flood Risk Management and Geomorphic Conditions*.

1.5.1.5 Flood Control and Coastal Storm Emergency Act

The Flood Control and Coastal Storm Emergency Act (Public Law [PL] 84-99) authorizes USACE if requested by the sponsor to undertake activities including disaster preparedness, advance measures, emergency operations, rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protective works threatened or damaged by coastal storms, and provisions of emergency water due to drought or contaminated source. PL 84-99

establishes an emergency fund for emergency response preparations for natural disasters, for flood fighting and rescue operations, and for rehabilitation of flood control and hurricane protection structures. Under PL 84-99, an eligible flood risk managementprotection system, such as the SRFCP, can be rehabilitated if damaged by a flood event.

1.5.2 Federal Projects within the Region

Related current and future Federal efforts within the SRFCP are noted below.

1.5.2.1 Sutter Basin Feasibility Study

SBFCA and the State of California are the non-Federal sponsors of a feasibility study for the Sutter Basin, which may eventually provide the Sutter Basin with a local objective of 100- to 200-year flood protectionlevel of performance (depending upon location). The Sutter Basin is bounded roughly by the Feather River, Cherokee Canal, Sutter Buttes, and the Sutter Bypass, and contains the cities of Biggs, Gridley, Live Oak, and Yuba City, as well as a significant amount of agricultural land. Past flood events and geotechnical analysis show that the levees surrounding the Sutter Basin (including the Feather River West Levee) have a higher probability of failure related to through- and under-seepage than levees designed to meet current standards. Additionally, the levees are at risk of overtopping from floods greater than they are designed to withstand.

The Sutter Basin Project is undergoing a feasibility study by USACE, Sacramento District, to determine Federal interest in implementing a flood-risk management (FRM) project. The feasibility study will evaluate structural and nonstructural flood risk management measures, including improvements to existing levees; construction of new levees; and other storage, conveyance, and nonstructural options. Any ecosystem restoration measures associated with FRM measures likely would include restoration of floodplain function and habitat. Any recreation measures associated to FRM measures would include those outdoor recreation opportunities associated with sustainable water resource development. As of September 2012, USACE anticipates that the draft integrated study report and EIS/EIR for the feasibility study will be released in FebruaryMay 2013.

In regard to the relationship between the FRWLP and the Sutter Basin Project, it is intended that some or all of the FRWLP will be constructed prior to any Sutter Basin Project construction, which can only occur after authorization of, and appropriation for, the Sutter Basin Project by Congress following completion of the feasibility study. SBFCA anticipates that State and SBFCA costs (non-Federal costs) to implement the FRWLP could be credited against the remaining non-Federal share of the cost of the Sutter Basin Project studied under the feasibility study. Credit is only available if the flood risk managementflood protection improvements constructed as part of the FRWLP are found to be integral to the Sutter Basin Project recommended in the feasibility study.

More specifically, requests for general credit for flood controlflood risk management under Section 221 of the Flood Control Act of 1970 (as amended by Section 2003 of the WRDA of 2007) may allow the work conducted by SBFCA and described in the feasibility study to be credited against the local cost sharing requirements of the Sutter Basin Project as long as the project features constructed are integral to the USACE project.

Because implementation of the improvements by SBFCA does not immediately use Federal funds, it would not result in a commitment of Federal resources that would prejudice selection of a feasibility study alternative before a final decision on the feasibility study alternatives is made. In addition, the project-specific improvements considered in this EIS/EIR are limited to a portion of the overall flood

risk managementprotection system considered in the feasibility study. In summary, the FRWLP is intended to be integral to the ultimate Sutter Basin Project.

1.5.2.2 Yuba Basin Project

The Yuba Basin Project is an initiative to provide a 200-year level of protection and higher for communities in Yuba County. When complete, it will be the first community in California's Central Valley to achieve the State's requirement of 200-year flood protectionlevel of performance.

The State and local interests (Yuba County, Yuba County Water Agency, and Three Rivers Levee Improvement Authority), began an advanced levee construction program in the southern portion of the county. Work is now complete on all of the 29.3 miles of levees, including the construction of two new setback levees on the east bank: the 2-mile long Bear River setback and the 6-mile long Feather River setback (downstream of, and unrelated to, the FRWLP). Besides providing greater regional flood protectionlevel of performance, these setback levees resulted in the creation of nearly 2,000 acres of wildlife habitat.All of this advanced work is being evaluated by USACE in the Yuba River Basin Project General Reevaluation Report (GRR), scheduled for completion in 2012. The scheduled work for the 7.5-mile long Marysville Ring Levee is the final piece to the entire project. In 2008, USACE approved a "separable element" for Marysville, so that work could begin while the GRR was underway. Construction in Marysville began in 2010 and several additional phases of the project are designed and ready for construction in 2013. Both the Marysville element and GRR are in need of additional appropriation for completion.

1.5.2.3 American River Common Features Project

To decrease flood riskincrease flood protection for the city of Sacramento, which is bordered by the left bank of the Sacramento River, the American River Common Features Project (Common Features) was authorized by Congress in the WRDA of 1996. This authorization called for strengthening the north and south levees of the American River and raising and strengthening the upper 12 miles of the left levee of the Sacramento River in the Natomas area, just north of the city of Sacramento. These improvements were considered *common features* of any comprehensive plan of flood risk managementprotection for the Sacramento area that might ultimately be approved by Congress. In the WRDA of 1999, the scope of the Common Features authorization was expanded to include raising portions of the north and south levees of the American River (including the Mayhew Levee), additionally strengthening portions of the north levee of the American River, and raising and strengthening the north and south levees of the Natomas Cross Canal in the Natomas area.

With the goal of strengthening the American River levees to enable them to pass a flow of 160,000 cubic feet per second (cfs), Common Features has installed roughly 24 miles of slurry wall up to depths of 80 feet, raised levees to provide adequate freeboard, addressed slope stability issues, and corrected some erosion problems. Because of the considerable cost increase of seepage remediation on the American River, all funds appropriated by Congress throughout the late 1990s and the early part of the 2000s were used for construction activities on the American River instead of for design efforts for the Natomas Basin. In 2006, the Common Features authorization was deemed sufficient to cover improvements to the left levee of the Sacramento River near the Pioneer Reservoir and in the Pocket/Freeport area.

USACE is currently developing two post-authorization change studies. The Common Features General Reevaluation Report (GRR) is reevaluating the previous Common Features project and

identifying levee improvements needed to provide the city of Sacramento and the Natomas area to the north with at least a 200-year level of ~~flood protection~~performance. The Common Features GRR is planned for completion in 2014. Construction associated with the report would begin approximately 1 year after adoption of the report by Congress. Much of this work was completed or is underway by SAFCA as an EIP and Section 408 action (see Section 1.5.3.3). The Natomas Post-Authorization Change Report documents the evaluation of features in the Natomas Basin portion of the Common Features project and was submitted to Congress in October 2010.

1.5.2.4 West Sacramento General Reevaluation Report

USACE and DWR published the previous Sacramento Metropolitan Area General Reevaluation Report in 1992. The purpose of that report was to recommend a program of improvements needed to remedy structural problems and limitations of the levee system that were revealed by the 1986 flood. The subsequent 1997 flood and revisions to USACE levee construction standards after the 2005 New Orleans flood shifted attention to under-seepage deficiencies that had not been considered in the previous study. Presently, USACE and WSAFCA are developing a GRR for West Sacramento levee improvements to assess the entirety of the levees protecting the city of West Sacramento in light of most recent criteria and knowledge regarding levee design, with particular attention to remediation of seepage deficiencies.

USACE uses GRRs to present the results of a reevaluation of a previously completed study, using current planning criteria and policies, due to changed conditions and/or assumptions. The results may reaffirm the previous plan, reformulate and modify it, or find that no plan is currently justified. The results are documented in a GRR which, if recommended and supported, also serves as the decision document for a Federal action (U.S. Army Corps of Engineers and Central Valley Flood Protection Board 2009).

The primary objective of the West Sacramento GRR is to determine the extent of Federal interest in additionally reducing the flood risk within the study area while concurrently exploring opportunities to increase recreation and restore the ecosystem along the Sacramento River within the study area. Much of this work was completed or is underway by WSAFCA as an EIP and Section 408 action (see Section 1.5.3.4). USACE anticipates completion of the GRR in 2014.

1.5.3 State and Local Projects within the Region

Related current and future state- and locally led efforts within the SRFCP are described below.

1.5.3.1 Lower Feather River Corridor Management Program

DWR is developing the Lower Feather River Corridor Management Plan (LFRCMP) as an integrated strategy for managing the 20-mile river corridor between the cities of Marysville and Yuba City and the Sutter Bypass. The lower 16 miles of the Feather River West Levee falls within the LFRCMP planning area (up to about Reach 16). The LFRCMP will provide guidance and recommendations for planners, land managers and decision-makers to manage the lower Feather River in a way that accomplishes the following primary purposes: protects public safety, facilitates flood protection system management and maintenance of flood control facilities, and conserves and enhances or restores habitat and ecosystem functions. The plan also has the following secondary purposes: promoting economic sustainability, land use compatibility, and recreational opportunities. As a part of this effort, DWR is developing a comprehensive permitting approach, and hopes to obtain

programmatic permits, with advance mitigation, for routine and extraordinary maintenance of the flood control system and for restoration activities in the corridor. As of publication of this EIS/EIR, a public draft of the LFRCMP has not been released. ~~DWR anticipates publishing a draft LFRCMP in 2012.~~

1.5.3.2 Three Rivers Levee Improvement Program

TRLIA, a joint powers agency, was established in May 2004 by the County of Yuba and Reclamation District (RD) 784 to finance and construct levee improvements in south Yuba County. The goal of the Three Rivers Levee Improvement Program is to provide 200-year ~~flood protection~~level of performance to more than 40,000 residents in Linda, Olivehurst, and Plumas Lake. Four work phases, covering 29 miles of levees, were identified to achieve this goal. All of the work identified in the four phases has been completed as of the end of 2011.

The levees affected by this project are the south levee of the Yuba River, the east levee of the Feather River, the north levee of the Bear River, and the west levee of the Western Pacific Interceptor Canal. Improvements included stability berms, slurry cutoff walls, erosion protection, corrections to levee geometry, levee height increases, relief wells, monitoring wells, and detention basins. Setback levees were constructed along a portion of the Bear River north levee and the Feather River east levee. The land within the setback areas of both levees totals 1,750 acres, and will be used for habitat restoration and agricultural purposes.

TRLIA is currently evaluating a portion of the Yuba Goldfields to determine if it is sufficient to provide 200-year ~~flood protection~~level of performance. TRLIA hopes to complete this evaluation by the end of 2012 and receive 200-year certification for the Goldfields shortly thereafter.

1.5.3.3 Natomas Levee Improvements Program

As part of its long-term program to improve the Natomas Basin levee system, SAFCA proposes to continue waterside and landside levee-strengthening efforts, including levee raises, seepage remediation, increased bank protection, levee stabilization, and flattening of landside levee slopes under the Natomas Levee Improvements Program (NLIP), an EIP and Section 408 action.

The ultimate goal of the NLIP is to provide the Natomas Basin with a 200-year ~~level of flood protection~~level of performance by improving conditions along approximately 26 miles of levees surrounding the Natomas Basin. These levees include the Natomas Cross Canal South Levee, Sacramento River East Levee, American River North Levee, Natomas East Main Drainage Canal West Levee, and the Pleasant Grove Creek Canal West Levee. The NLIP is a four-phase construction program: Phase 1 occurred in 2008, Phase 2 in 2009 and 2010, Phase 3 in 2010 and 2011, and a majority of Phase 4a work was completed in 2011 with the remainder scheduled for 2013. Phases 1 through 4a focus on the Natomas Cross Canal South Levee and a large portion of the Sacramento River East Levee.

Portions of work under the Phase 3, 4A, and 4B along the Sacramento River East Levee, the American River North Levee, the Natomas East Main Drainage Canal West Levee, the Pleasant Grove Creek Canal West Levee, and water supply and drainage pump station improvements are still needed but have been deferred from SAFCA's EIP construction program. The USACE completed the Post Authorization Change Report and Interim General Re-evaluation Report, American River Common Features Project, Natomas Basin, Sacramento and Sutter Counties, California study and has an approved Chief's report that is currently under consideration for Congressional authorization.

After Federal authorization is secured, SAFCA will work with the State and USACE to continue implementation of the NLIP.

1.5.3.4 West Sacramento Levee Improvements Program

WSAFCA proposes to implement the Southport project along the right bank of the urbanized reach of the Sacramento River as an EIP and Section 408 action. The study reach is approximately 6 miles, beginning at the upstream limit where a SRBPP element terminates south of the barge canal connecting the Sacramento River to the Sacramento River Deep Water Ship Channel and extending downstream to West Sacramento city limit at the southern cross levee. The project would most immediately protect the part of the city known as Southport and is targeted at addressing under-seepage, through-seepage, erosion, and slope instability. This project is presently undergoing design development and an EIS/EIR is being prepared with USACE as the Federal lead agency for NEPA based on USACE's responsibilities under Section 408, Section 404, and Section 10. Similar to the relationship of the FRWLP to the Sutter Basin Feasibility Study, WSAFCA's Southport project is being coordinated with the ongoing West Sacramento Project GRR (described previously). This project follows three others implemented by WSAFCA as EIPs and Section 408 actions, namely, the I Street Bridge project (completed in 2008) and the California Highway Patrol~~HP~~ Academy and The Rivers projects (completed in 2011).

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

1.6.1 Community Outreach

USACE and SBFCA have established a proactive multi-media outreach program to affected communities, the general public, and stakeholders about the FRWLP. The approach to the outreach program has been to go beyond the guidelines and requirements of NEPA and CEQA for public noticing to ensure the affected community and other interested stakeholders are informed, engaged, and involved through an accessible, open, and transparent process. Thus far, the FRWLP outreach program has included the following actions.

- Holding four scoping meetings and three public hearings for the environmental document.
- Publication of notices in local newspapers of major circulation.
- Publications in the Federal Register.
- Notifications to the State Clearinghouse.
- Posting NEPA notices on the USACE website.
- Posting CEQA notices and project information on the SBFCA website.
- Publication in a local newsletter, distributed quarterly to all parties subject to the assessment district for updates and information about flood management activities.
- Presentation and discussion of the status of the project at various public meetings for elected boards and commissions.
- Phone calls to public agencies.

- Small-group meetings with interested stakeholders.
- Posting of notices in public places.

The FRWLP scoping effort was conducted jointly with a separate but related USACE project, a feasibility study for the Sutter Basin, mentioned earlier. The two projects are related in their study area, purpose, potential measures, and potential effects. Despite joint scoping, two separate EIS/EIRs are being developed for each project. A more detailed accounting of the scoping process conducted in June 2011 is provided in Appendix B.

In January 2013, three hearings were held to receive public comments on the FRWLP Draft EIS/EIR that was published in December 2012. Thirty-one individuals attended the meeting in Gridley on January 15, of whom 13 individuals provided verbal comment. In Yuba City on January 16, 41 individuals attended the 3:00–5:00 pm meeting, of whom seven individuals provided verbal comment. The 6:00–8:00 pm meeting on the same day in Yuba City had 25 attendees, and 16 of those provided verbal comment. The transcripts from the public hearings can be found in Part II, Chapter 5 of the Final EIS. Two comment cards were also received from the attending public and are also included in Chapter 4 of Part II of this FEIS.

As the proposed improvements and FRWLP EIS/EIR are further developed, the outreach program would continue in a broad sense through the methods listed above and would expand through more targeted specific outreach to residents and businesses who might be more directly affected by construction or operation of the proposed improvements.

To date, the results of the FRWLP outreach program have been favorable, constructive, and supportive. The tone and substance of the input has been consistent with the voter-approved assessment to fund the local share of the project.

1.6.2 Agency Consultation and Coordination

The FRWLP has been planned in coordination and cooperation with numerous local, state, and Federal agencies. In Chapter 3, the regulatory setting for each respective resource describes compliance with applicable Federal, state, regional, and local laws and regulations, including consultation to date with various agencies. Additional regulatory context is presented in Appendix A.

1.6.2.1 Responsible and Trustee Agencies

This EIS/EIR would be used by Responsible and Trustee Agencies to determine the effects of the proposed action. Responsible Agencies are those that may have a legal responsibility to approve the project. These agencies are required to rely on the Lead Agency's environmental document in acting on whatever aspect of the project requires their approval but must prepare and issue their own findings regarding the project (CEQA Guidelines Section 15096). Trustee Agencies are those that have jurisdiction over certain resources held in trust for the people of California but do not have legal authority over approving or carrying out the project. Potential Responsible and Trustee Agencies for the FRWLP are presented in Table 1-6.

Table 1-6. Potential Responsible and Trustee Agencies for the FRWLP

Agency	Jurisdiction
Trustee Agency	
U.S. Environmental Protection Agency	NEPA and CWA coordination
California Department of Fish and Wildlife ~~Game~~	~~Fish and wildlife~~ ~~Native plants designated as rare or endangered~~ Game refuges Ecological reserves
California Department of Conservation	Williamson Act lands
California State Lands Commission	State-owned "sovereign" lands
Responsible Agency	
~~U.S. Environmental Protection Agency~~	~~NEPA and CWA coordination~~
U.S. Fish and Wildlife Service	Fish and wildlife and Endangered Species Act
National Marine Fisheries Service	Anadromous fish and Endangered Species Act
U.S. Department of Agriculture	Prime farmland conversion
California Department of Fish and Wildlife~~Game~~	Fish and wildlife Native plants designated as rare or endangered ~~Game refuges~~ ~~Ecological reserves~~
Office of Historic Preservation	Historic and cultural resources
Central Valley Flood Protection Board	Levee modifications
California Air Resources Board	Air quality
Regional Water Quality Control Board (#5)	Water quality and discharges to water bodies
California Department of Water Resources	State water and ~~flood control~~flood risk management interests
Sutter and Butte Counties/State Mining and Geology Board	Surface mining and reclamation activities associated with borrow

1.6.3 Issues of Known or Expected Controversy

NEPA requires that project proponents identify issues of known controversy that have been raised in the scoping process and throughout the development of the project.

1.6.3.1 Construction-Related Effects

As the levee system in the study area is in close proximity to residential areas and other developed land uses, flood improvements proposed under the FRWLP are likely to result in construction-related effects. These effects include those under the topics of public safety, noise, traffic, and air quality and are specifically described in Chapter 3 as well as temporary effects on property use and access. Seventeen individuals or agency representatives presented this as an issue of concern during the public comment period. Their comments are located in Part II FRWLP Response to Comments section.

1.6.3.2 Property Acquisition

A specific subset of construction-related effects involves potential conflicts with private property underlying or near proposed improvements. In some cases there may be temporary property use in the form of construction easements to build the project and permanent acquisition for ~~operations and maintenance~~O&M of the project. These effects are described under the land use sections in Chapter 3. Eight individuals or agency representatives presented this as an issue of concern during the public comment period. Their comments are located in Part II FRWLP Response to Comments section.

1.6.3.3 Levee Encroachments and Vegetation

The FRWLP alternatives are likely to include removal, relocation, or replacement of features in, on, or under the levee or adjacent O&M corridors such as structures, pipelines, walls, stairs, utilities, and other elements such as vegetation.

USACE published technical guidance and reinforcement of policies restricting woody vegetation on Federal project levees. Implementation of such guidance has stirred controversy in the Sacramento Valley as cursory assessments have shown that much vegetation may require removal, resulting in effects on fish and wildlife habitat, including habitat for endangered and threatened species, and social values like recreation and aesthetics. The FRWLP would be subject to this guidance. This issue is further described previously in Section 1.3.2.5 and in Chapter 2, *Alternatives*, and under the effects discussions for vegetation, fish, wildlife, visual resources, and recreation. Other encroachments are addressed in the land use, utilities, and housing sections of Chapter 3. Thirteen individuals or agency representatives presented this as an issue of concern during the public comment period. Their comments are located in Part II FRWLP Response to Comments section.

1.6.3.4 Climate Change and Sea-Level Rise

Global climate change and resultant sea-level rise are phenomena receiving international attention. These issues are further analyzed in the effects discussions in Chapter 3 under the *Air Quality* and *Climate Change and Greenhouse Gas* sections. Four individuals or agency representatives presented this as an issue of concern during the public comment period. Their comments are located in Part II FRWLP Response to Comments section.

1.6.3.5 River Access for Recreation

The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor. Six individuals or agency representatives presented this as an issue of concern during the public comment period. Their comments are located in Part II FRWLP Response to Comments section.

Chapter 2
Alternatives

2.1 Introduction

This chapter describes the following elements.

- Project alternatives.
- Construction timing.
- Detailed measures comprising the project alternatives.
- Common elements, assumptions, and environmental commitments incorporated into each project alternative.
- A no action alternative.
- Alternatives screening.

2.2 Project Alternatives

2.2.1 Overview of Measures Carried Forward in Alternatives Development

For each deficiency noted in Chapter 1, a number of measures or combination of measures can be used to reduce flood risk. Table 2-1 summarizes the deficiencies identified in the project area and potential measures that could be applied to resolve each deficiency. These measures have been combined to comprise the project alternatives. Section 2.5, *Detailed Measure Descriptions*, provides a more detailed description of each measure in terms of its objective, design and construction, equipment needs, and ~~operations and maintenance~~O&M requirements.

Table 2-1. Summary of Measures and Deficiencies

	Deficiency				
Measure	Through-Seepage	Under-Seepage	Slope Stability and Geometry	Erosion	Encroachments
Slurry cutoff wall	✓	✓			
Slope flattening	✓		✓		
Stability berm	✓				
Levee reconstruction	✓		✓		✓
Sheet pile wall	✓				
Seepage berm		✓			
Relief wells		✓			
Depression/ditch infilling		✓			
Clay ditch lining		✓			
Limited encroachment removal					✓
Canal seepage treatment		✓			

2.2.2 Overview of Alternatives Carried Forward

NEPA and CEQA require that an EIS or EIR (respectively) consider a range of alternatives that would attain most of the project purpose, need, and objectives while avoiding or substantially lessening project effects. A range of reasonable alternatives is analyzed to sharply define the issues and provide a clear basis for comparison among the options. The NEPA/CEQA analysis also must include an analysis of a no action or no project alternative. Consistent with NEPA standards, alternatives are analyzed on an equal basis and at an equal level of detail; however, because the role of USACE as the Federal lead agency is one of granting permission rather than as a sponsor or proponent of the project, SBFCA as the applicant may identify an applicant-preferred alternative.

Based on SBFCA's planning process and engineering studies, the measures listed in Table 2-1 have been combined, developed, and screened into three project alternatives for the FRWLP to be carried forward for study in the EIS/EIR (in addition to the no action alternative). In keeping with NEPA, each alternative is analyzed at an equal level of detail. The alternatives are summarized below based on their primary formulation concept, followed by a table of measures used in each alternative (Table 2-2), a table highlighting how the reaches are broken out by construction contract and the respective timelines for construction (Table 2-3), and a detailed table of the measures proposed by reach (Table 2-4). Plate 2-1 illustrates the alternatives.

- **Alternative 1.** Alternative 1 is focused on those measures which would predominantly keep within the existing footprint of the Feather River West Levee. Advantages of an alternative formulated on this basis are that it may minimize real estate acquisition and changes in land use. This alternative primarily proposes cutoff walls as a technique to address the deficiencies (along with other measures) while minimizing change in the existing levee footprint.

- **Alternative 2.** Alternative 2 includes measures which would not be constrained by the existing footprint of the Feather River West Levee. Advantages of an alternative formulated on this basis are that it may more effectively address the deficiency or may be less in cost compared to measures within the levee footprint. This alternative primarily proposes stability berms and seepage berms (along with other measures), which would substantially extend beyond the current levee footprint.
- **Alternative 3.** Alternative 3 is a blend of the flood management measures identified in Alternatives 1 and 2, optimized based on the screening criteria. Optimized means a number of factors have been considered, such as effectiveness in addressing the deficiencies, compatibility with land use, minimization of real estate acquisition, avoidance of effects, and cost; the footprint has been considered but not held as a primary constraint. This alternative proposes a combination of cutoff walls and berms (along with other measures). Alternative 3 is the applicant-preferred alternative (APA) and has been optimized to avoid and minimize environmental effects. Alternative 3 is also considered to be the environmentally preferable alternative because it balances borrow material import needs, emissions, real estate acquisition and land use change, habitat effects (see Table 3.8-6), and construction-related disturbance. While it may not be the least impactful alternative for every resource category, it is the least impactful as a composite across all resource categories (see Table ~~(~~ES-6).

Section 2.7.3, *Screening of Alternatives Carried Forward*, provides a description of screening for alternatives carried forward.

Table 2-2. Summary of Measures Used by Alternative

Measure	Alternative 1	Alternative 2	Alternative 3
Slurry cutoff wall	✓	✓	✓
Slope flattening	✓	✓	✓
Stability berm		✓	✓
Levee reconstruction	✓	✓	✓
Seepage berm	✓	✓	✓
Relief wells		✓	✓
Depression/ditch infilling	✓	✓	✓
Clay ditch lining	✓		
Limited encroachment removal	✓	✓	✓
Canal seepage treatment	✓		✓

Note: Sheet pile walls may be used for limited, site-specific conditions in any alternative but are not planned for large-scale application for a project reach.

2.2.3 Construction Timing

Specific sequencing of construction would be dynamic throughout project planning and design, subject to change based on factors including the following.

- Further engineering in determining the clarity and efficacy of site-specific measures.
- Easement and right-of-way acquisition (where necessary).
- Availability of proximate, suitable, and cost-effective borrow material.
- Environmental clearances based on wildlife presence, lifecycle activity, and location of habitats.

Based on current planning analysis, under each of the three alternatives, construction would occur in more than one annual construction season (typically April 15 to November 30, subject to conditions) and would proceed as noted below.

It is anticipated the construction of the FRWLP would be divided into four separate construction contracts (i.e., A, B, C, and D). Although subject to change, the four contracts and their respective areas for construction of the FRWLP are identified in Table 2-3. Figure 2-1 also identifies which reaches are within each construction contract.

Table 2-3. Construction Contracts, FRWLP Reaches, and Years for Construction

Construction Contract	FRWLP Reaches	Years for Construction
A	2–5	2014–2015
B	6–12	2014–2015
C	13–25	2013–2014
D	26–41	2014–2015

It should be noted that 2015 is the presently anticipated year for completion and is consistently used throughout the analysis as presenting the conditions that would result in the greatest severity effect magnitude and disclosure of maximum effects (e.g., for air quality, 2015 represents the most conservative basis for analysis because it is the most aggressive feasible schedule in determining daily and annual emissions). The one exception is that 2017 is used for the consultations with USFWS and NMFS because the longer construction duration represents maximum effects based on habitat disturbance.

Contract A of the FRWLP begins at Levee Station 202+50 near the intersection of the Feather River West Levee and Laurel Road, and continues north to the beginning of the improvements constructed as part of the Star Bend Setback Levee project, Levee Station 478+68. The total length of the levee in this portion of the FRWLP is 27,618 linear feet.

Contract B of the Feather River West Levee begins at Levee Station 478+66, the end of the improvements constructed as part of the Star Bend Setback Levee project, and continues north to Levee Station 831+50. The total length of the levee in this portion of the FRWLP is 31,963 linear feet.

Contract C begins at Levee Station 845+00, near the north end of the Shanghai Bend Setback Levee, and continues north to Levee Station 1674+37. The total length of the levee in this portion of the FRWLP is 77,886 linear feet.

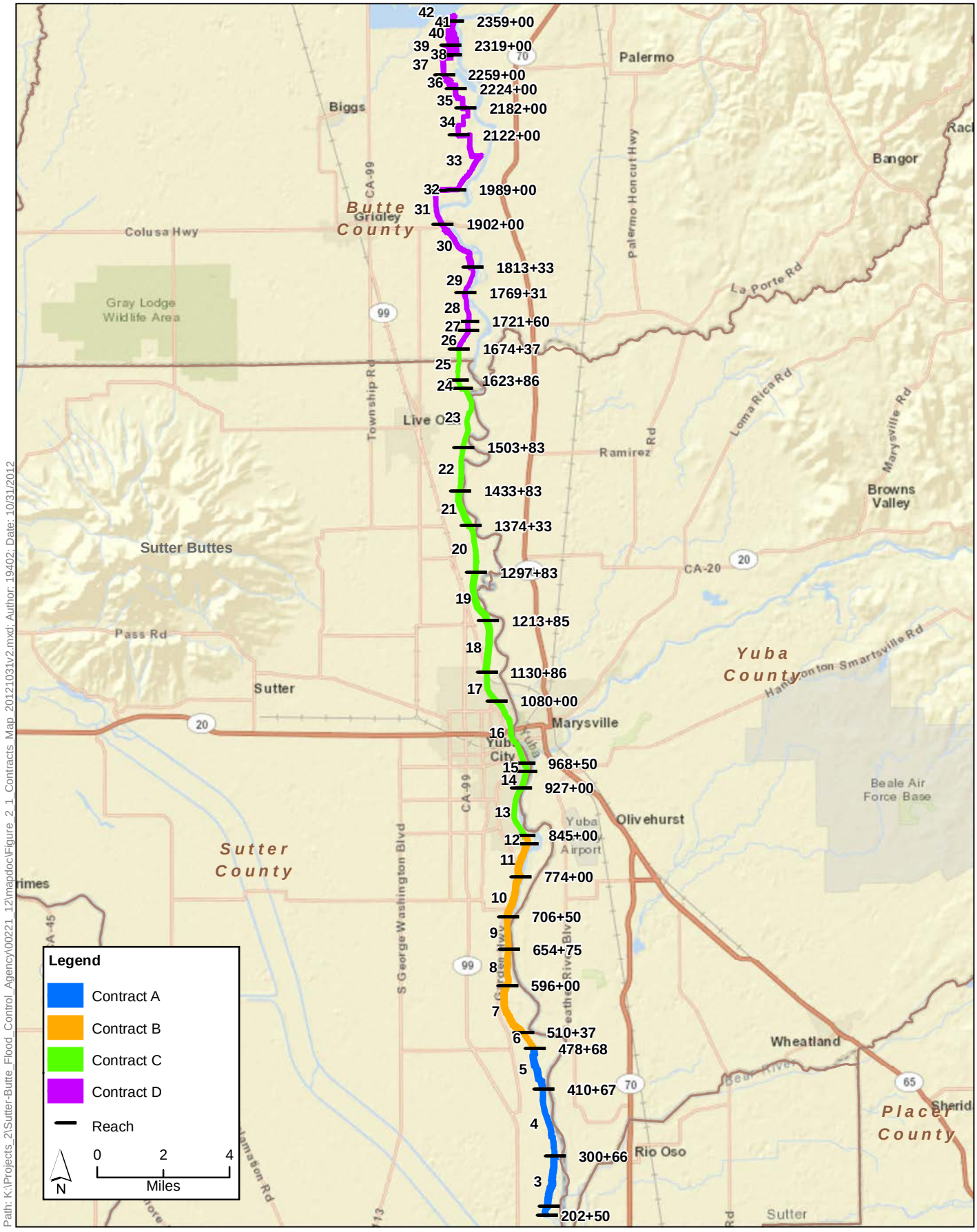

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Figure 2-1
Project Contract Reaches

Contract D begins at Levee Station 1674+37 and continues north Levee Station 2368+00. The total length of the levee in this portion of the FRWLP is 69,363 linear feet.

Reach 1 is not currently part of the FRWLP.

The construction of each contract is anticipated to occur in single 10-hour shifts, 6 days a week. An exception to this schedule is cutoff wall construction, which is anticipated to occur in two 10-hour shifts (essentially 24-hour construction), 6 days a week. While actual construction would not occur between the two 10-hour shifts, equipment maintenance and preparations for the upcoming work shift would occur. Maintenance work is also anticipated on Sundays.

Table 2-4. FRWLP Action Alternatives by Reach

Construction Contract	Reach	Length (feet)	Alternative 1	Alternative 2	Alternative 3
			Flood Management Measure	Flood Management Measure	Flood Management Measure
A	2	1,616	202+50 to 220+00, cutoff wall tip elevation (-)73' with full levee degrade.	202+500 to 218+66, cutoff wall tip elevation 30' with 100'-wide undrained seepage berm.	202+50 to 218+66, cutoff wall extending to an elevation of 25' with 100'-wide undrained seepage berm. Seepage berm 5' thick at berm toe.
A	3	8,200	218+66 to 230+00 cutoff wall tip elevation 20'; 230+00 to 250+00 cutoff wall tip elevation (-)35'; 250+00 to 289+00 cutoff wall tip elevation (-)20'; 289+00 to 300+66 cutoff wall tip elevation 15'.	8'-tall drained stability berm on 300'-wide undrained seepage berm with monitoring for seepage at the toe of the berm.	218+66 to 230+00 cutoff wall extending to an elevation of 25' with 100'-wide undrained seepage berm. Seepage berm 5' thick at berm toe; 230+00 to 250+00 cutoff wall tip elevation (-)35'; 250+00 to 289+00 cutoff wall tip elevation (-)20'; 289+00 to 300+66 cutoff wall tip elevation (-)12'.
A	4	11,001	300+66 to 349+00 cutoff wall tip elevation 15'; 349+00 to 368+00 cutoff wall tip elevation 10'; 368+00 to 410+67 cutoff wall tip elevation 20'.	8'-tall drained stability berm on 100'-wide undrained seepage berm.	300+66 to 312+00 cutoff wall tip elevation 15'; 312+00 to 349+00 cutoff wall tip elevation 15'; 349+00 to 368+00 cutoff wall tip elevation 10'; 368+00 to 410+67 cutoff wall tip elevation 20'.

Construction Contract	Reach	Length (feet)	Alternative 1 Flood Management Measure	Alternative 2 Flood Management Measure	Alternative 3 Flood Management Measure
A	5	6,801	410+67 to 417+00, cutoff wall tip elevation 20’; 417+00 to 425+00, cutoff wall tip elevation 10’; 425+00 to 456+00, cutoff wall tip elevation 15’; 456+00 to 478+68, cutoff wall tip elevation 15’ with 200’-wide undrained seepage berm.	410+67 to 444+00, 300’ wide seepage berm; 444+00 to 478+67, 300’ wide seepage berm with monitoring for seepage at the toe of the berm.	410+67 to 417+00, cutoff wall tip elevation 20’; 417+00 to 425+00, cutoff wall tip elevation 10’; 425+00 to 456+00, cutoff wall tip elevation 15’; 456+00 to 475+35, cutoff wall tip elevation 15’ with 300’ wide undrained seepage berm. Seepage berm 5’ thick at berm toe; 475+35 to 478+68 no flood management required
B	6	3,169	510+00 to 510+50, potential pipe crossing work to install positive closure device and correct pipe size.	510+00 to 510+50, potential pipe crossing work to install positive closure device and correct pipe size.	510+00 to 510+50, potential pipe crossing work to install positive closure device and correct pipe size.
B	7	8,563	510+37 to 528+00, cutoff wall tip elevation 15’; 528+00 to 546+00, cutoff wall tip elevation (-)10’; 546+00 to 565+00, (-)65’ with Full Levee Degrade; 565+00 to 576+00, cutoff wall tip elevation (-)50’; 576+00 to 584+00, cutoff wall tip elevation (-)10’; 584+00 to 598+87, cutoff wall tip elevation 20’.	9.5’-tall and 13’-wide, at the top, drained stability berm on 300’-wide undrained seepage berm with monitoring for seepage at the toe of the berm. Height of seepage berm at levee toe is 7’.	510+37 to 514+37 no flood management required 514+00 to 526+00, cutoff wall tip elevation 15’; 526+00 to 570+00, cutoff wall tip elevation 5’; 545+00 to 570+00, Relief wells with 60’ spacing and 50’ depth over one half of the length, distributed at various locations over this stretch of levee; 570+00 to 575+00, cutoff wall tip elevation 5’; 575+00 to 595+00, cutoff wall tip elevation (-)10’; 595+00 to 596+00, cutoff wall tip elevation 15’.
B	8	5,875	598+87 to 646+00, cutoff wall tip elevation 15’; 646+00 to 654+75, cutoff wall tip elevation (-)15’.	Shallow cutoff wall tip elevation 38’ with 130’-wide seepage berm. Height of seepage berm at levee toe is 5’.	596+00 to 654+75, cutoff wall tip elevation 15’.

Construction Contract	Reach	Length (feet)	Alternative 1 Flood Management Measure	Alternative 2 Flood Management Measure	Alternative 3 Flood Management Measure
B	9	5,175	654+75 to 668+00, cutoff wall tip elevation (-)15’; 668+00 to 706+00, cutoff wall tip elevation 20’.	Shallow cutoff wall tip elevation 35’ with 110’-wide seepage berm. Height of seepage berm at levee toe is 5’.	654+75 to 670+00, cutoff wall tip elevation 15’; 670+00 to 697+00, cutoff wall tip elevation 20’; 697+00 to 706+50: cutoff wall tip elevation 10’.
B	10	6,750	706+50 to 745+00, cutoff wall tip elevation (-)5’; 745+00 to 774+00, cutoff wall tip elevation 25’.	Shallow cutoff wall tip elevation 30’ with 300’-wide seepage berm. Height of seepage berm at levee toe is 7’.	706+50 to 726+00, cutoff wall tip elevation (-)10’; 726+00 to 746+00, cutoff wall tip elevation (-)5’; 746+00 to 754+50, cutoff wall tip elevation 5’; 754+50 to 774+00, cutoff wall tip elevation 25’.
B	11	5,600	774+00 to 784+00, cutoff wall tip elevation 25’; 784+00 to 824+00, cutoff wall tip elevation (-)5’; 824+00 to 830+00, cutoff wall tip elevation 25’.	7.5’ wide drained stability berm on 300’-wide seepage berm. Height of seepage berm at levee toe is 7’.	774+00 to 784+50, cutoff wall tip elevation 25’; 784+50 to 827+50, cutoff wall tip elevation 5’; 827+50 to 831+50, cutoff wall tip elevation 25’.
B	12	1,500	832+30, relocate two 24-inch sewer pipes.	832+30, relocate two 24-inch sewer pipes.	832+30, relocate two 24-inch sewer pipes.
C	13	8,200	845+00 to 857+00, cutoff wall tip elevation (-)33’; 857+00 to 927+00, cutoff wall tip elevation (-)28’.	Shallow cutoff wall tip elevation 35’ with relief wells at 200’ spacing and 65’ deep.	844+50 to 923+75: cutoff wall tip elevation (-)30’. Full levee degrade from 844+50 to 897+50.
C	14	2,740	952+00 investigation of 12 kv cable to determine if it meets Title 23.	952+00 investigation of 12 kv cable to determine if it meets Title 23.	952+00 investigation of 12 kv cable to determine if it meets Title 23.
C	15	1,410	No flood management measures required.	No flood management measures required.	No flood management measures required.

Construction Contract	Reach	Length (feet)	Alternative 1	Alternative 2	Alternative 3
			Flood Management Measure	Flood Management Measure	Flood Management Measure
C	16	11,150	Flatten Waterside Slope 1007+00 and 1025+20 Cutoff wall via TRD, jet grouting or a sheet pile wall.	Flatten Waterside Slope 1007+00 and 1025+20 Cutoff wall gap closure using TRD, jet grouting or sheet piling method.	Closure of gap in cutoff wall at 5th Street bridge crossing around Station 1007+00, cutoff wall tip elevation 40'; Closure of gap in cutoff wall at 10th Street bridge crossing around Station 1026+00, by using a seepage berm within the abandoned railroad tunnel; 1077+85 to 1080+00, cutoff wall tip elevation 30' and backfill landside toe depression. Miscellaneous landside encroachment relocations/removals
C	17	5,086	Cutoff wall tip elevation 35'; Fill-in the landside toe depression (depression is 4' deep and 40' wide).	Shallow cutoff wall tip elevation 58' with relief wells at 45' spacing and 38.5' deep.	1080+00 to 1089+00, cutoff wall tip elevation 30' and backfill landside toe depression; 1089+00 to 1125+00, cutoff wall tip elevation 35' and backfill landside toe depression; 1125+00 to 1130+86, cutoff wall tip elevation 0'.
C	18	8,299	1130+86 to 1149+50, cutoff wall tip elevation 0; 1149+50 to 1190+00, cutoff wall tip elevation 30; 1190+00 to 1213+85, cutoff wall tip elevation 40 1131+00 Cutoff wall gap closure using TRD, jet grouting or sheet piling method.	300'-wide undrained seepage berm (thickness at the levee toe: 7') with relief wells at 100' spacing and 30' deep; 1131+00 cutoff wall gap closure using TRD, jet grouting or sheet piling method.	1130+86 to 1151+50, cutoff wall tip elevation 0'; 1151+50 to 1159+50: cutoff wall tip elevation 30'; 1159+50 to 1169+50: cutoff wall tip elevation 25'; 1169+50 to 1189+50: cutoff wall tip elevation 30'; 1189+50 to 1209+50: cutoff wall tip elevation 40'; 1209+50 to 1213+85: cutoff wall tip elevation 35'.

Construction Contract	Reach	Length (feet)	Alternative 1 Flood Management Measure	Alternative 2 Flood Management Measure	Alternative 3 Flood Management Measure
C	19	8,398	1213+85 to 1224+00 cutoff wall tip elevation 40’; 1224+00 to 1240+00 cutoff wall tip elevation (-)27’; 1240+00 to 1269+00 cutoff wall tip elevation 5’; 1269+00 to 1297+83 cutoff wall tip elevation 35’.	10’-tall drained stability berm on 300’-wide undrained seepage berm (thickness at the levee to: 7’) with relief wells 100’ spacing and 50’ deep.	1213+85 to 1219+75, cutoff wall tip elevation 35’; 1219+75 to 1224+00, cutoff wall tip elevation 5’; 1224+00 to 1238+00, cutoff wall tip elevation (-)28’; 1238+00 to 1248+00, cutoff wall tip elevation (-)42’; 1248+00 to 1268+75, cutoff wall tip elevation 3’; 1268+75 to 1297+83, cutoff wall tip elevation 35’.
C	20	7,650	1297+83 to 1359+00, cutoff wall tip elevation 50’; 1359+00 to 1369+00, cutoff wall tip elevation 40’; 1369+00 to 1374+33 cutoff wall tip elevation 50’.	70’-wide seepage berm, seepage berm (thickness at the levee toe: 5’); 1297+83 to 1309+00 and 1320+00 to 1374+33, 8.5’-tall drained stability berm.	1297+83 to 1298+75, cutoff wall tip elevation 35’; 1298+75 to 1359+00, cutoff wall tip elevation 50’; 1359+00 to 1369+00: cutoff wall tip elevation 40’; 1369+00 to 1374+33: cutoff wall tip elevation 32’.
C	21	5,950	1374+33 to 1379+00, cutoff wall tip elevation 40’; 1379+00 to 1389+00, cutoff wall tip elevation 50’; 1389+00 to 1409+00, cutoff wall tip elevation 60’; 1409+00 to 1433+83 cutoff wall tip elevation 40’.	8’-tall drained stability berm on 300’-wide undrained seepage berm (thickness at the levee toe: 6.5’); relief wells at 100’ spacing and 20’ deep.	1374+33 to 1386+00 cutoff wall tip elevation 32’; 1386+00 to 1408+00: cutoff wall tip elevation 55’; 1408+00 to 1433+00: cutoff wall tip elevation 40’.
C	22	7,000	1433+83 to 1449+00, cutoff wall tip elevation 40’; 1449+00 to 1469+00, cutoff wall tip elevation 50’; 1469+00 to 1503+83, cutoff wall tip elevation 55’; 1433+83 to 1459+77, full levee degrade and reconstruction.	Sutter Butte Canal (SBC) seepage treatment (see section 2.5.11); 1433+83 to 1459+77, full levee degrade and reconstruction; 1459+77 to 1503+83, 10’-tall drained stability berm.	1433+83 to 1448+75, cutoff wall tip elevation 40’; 1448+75 to 1468+83, cutoff wall tip elevation 50’; 1455+00 to 1461+00, full levee degrade and reconstruction; 1468+83 to 1503+83, cutoff wall tip elevation 55’.

Construction Contract	Reach	Length (feet)	Alternative 1 Flood Management Measure	Alternative 2 Flood Management Measure	Alternative 3 Flood Management Measure
C	23	10,554	1503+83 to 1509+00, cutoff wall tip elevation 55’; 1509+00 to 1529+00, cutoff wall tip elevation 60’; 1529+00 to 1566+00, cutoff wall tip elevation 55’; 1566+00 to 1589+00, cutoff wall tip elevation 60’; 1589+00 to 1609+37, cutoff wall tip elevation 40’.	100’-wide undrained seepage berm (thickness at the levee toe: 5’).	1503+83 to 1508+50, cutoff wall tip elevation 55’; 1508+50 to 1528+75, cutoff wall tip elevation 60’; 1528+75 to 1566+50, cutoff wall tip elevation 55’; 1566+50 to 1608+75, cutoff wall tip elevation 60’.
C	24	1,449	Cutoff wall tip elevation 64’; Excavate and place 4.5’-thick compacted clay fill at bottom of adjacent ditch.	SBC seepage treatment (see section 2.5.11).	1608+75 to 1623+86, cutoff wall tip elevation 28’.
C	25	5,051	1623+86 to 1625+00, cutoff wall tip elevation 28’; ~~1673+00 to 1674+37, cutoff wall tip elevation 65’~~ ~~1639+00 replace two 24-inch steel storm drain pipes.~~	1623+86 to 1625+00, cutoff wall tip elevation 28’; ~~1673+00 to 1674+37, cutoff wall tip elevation 65’~~ ~~1639+00 replace two 24-inch steel storm drain pipes.~~	1623+86 to 1625+00, cutoff wall tip elevation 28’; ~~1673+00 to 1674+37, cutoff wall tip elevation 65’~~ ~~1639+00 replace two 24-inch steel storm drain pipe~~s.
D	26	3,274	1673+00 to 1674+37, cutoff wall tip elevation 65’; 1639+00 replace two 24-inch steel storm drain pipes; 1674+37 to 1686+00, cutoff wall tip elevation 75’; 1686+00 to 1707+11, cutoff wall tip elevation 65’ and reconstruct landside slope.	1673+00 to 1674+37, cutoff wall tip elevation 65’; 1639+00 replace two 24-inch steel storm drain pipes. SBC seepage treatment (see section 2.5.11).	1673+00 to 1674+37, cutoff wall tip elevation 65’; 1639+00 replace two 24-inch steel storm drain pipe; 1674+37 to 1707+11, cutoff wall tip elevation 65’; Reconstruction of landside slope extends down to elevation of bottom of SBC.
D	27	1,449	Cutoff wall tip elevation 65’ and reconstruct landside slope.	SBC seepage treatment (see section 2.5.11).	1707+11 to 1721+60: cutoff wall tip elevation 65’; Reconstruction of landside slope extends down to elevation of bottom of SBC.
D	28	4,771	1721+60 to 1728+00, cutoff wall tip elevation 65’; 1728+00 to 1749+00, cutoff wall tip elevation 80’; 1749+00 to 1769+31, cutoff wall tip elevation 45’ and reconstruct landside slope.	SBC seepage treatment (see section 2.5.11).	1721+60 to 1727+75, cutoff wall tip elevation 65’; 1727+75 to 1748+50, cutoff wall tip elevation 70’; 1748+50 to 1769+31, cutoff wall tip elevation 45’; Reconstruction of landside slope extends down to elevation of bottom of SBC.

Construction Contract	Reach	Length (feet)	Alternative 1 Flood Management Measure	Alternative 2 Flood Management Measure	Alternative 3 Flood Management Measure
D	29	4,402	1770+00, 1785+24, 1785+55, 1792+96, 1799+44, 1809+65 storm drain and irrigation pipe replacements.	1770+00, 1785+24, 1785+55, 1792+96, 1799+44, 1809+65 storm drain and irrigation pipe replacements.	1770+00, 1785+24, 1785+55, 1792+96, 1799+44, 1809+65 storm drain and irrigation pipe replacements.
D	30	8,867	1813+33 to 1816+40, cutoff wall tip elevation 80'; 1816+40 to 1865+90, cutoff wall tip elevation 40'; 1865+90 to 1877+90, cutoff wall tip elevation 50'; 1877+90 to 1902+00, cutoff wall tip elevation 30'.	1813+33 to 1831+00, 300'-wide undrained seepage berm (6.5' thick at levee toe); 1831+00 to 1888+00, 100'-wide undrained seepage berm (5 feet thick at levee toe); 1888+00 to 1895+00, 300'-wide undrained seepage berm (6.5' thick at levee toe); 1895+00 to 1902+00, 100'-wide undrained seepage berm (5' thick at levee toe); 1813+33 to 1902+00, 4'-tall drained stability berm on top seepage berms.	1813+33 to 1816+50, cutoff wall tip elevation 80', with full levee degrade and reconstruction; 1816+50 to 1848+25, cutoff wall tip elevation 30'; 1848+25 to 1866+00, cutoff wall tip elevation 70'; 1866+00 to 1877+75, cutoff wall tip elevation 47'; 1877+75 to 1883+00, cutoff wall tip elevation 40'; 1883+00 to 1902+00, cutoff wall tip elevation 27'.
D	31	5,600	1902+00 to 1916+90, cutoff wall tip elevation 30'; 1916+90 to 1933+90, cutoff wall tip elevation 75'; 1933+90 to 1958+00, cutoff wall tip elevation 40'; 1902+00 cutoff wall gap closure using TRD, jet grouting or sheet piling method.	SBC seepage treatment (see section 2.5.11);1902+00 cutoff wall gap closure using TRD, jet grouting or sheet piling method.	1902+00 to 1907+50, cutoff wall tip elevation 27'; 1907+50 to 1917+50, cutoff wall tip elevation 44'; 1907+92 to 1909+42, waterside slope flattening or other remedial measure; 1917+50 to 1927+50, cutoff wall tip elevation 75'; 1927+50 to 1937+00, cutoff wall tip elevation 50'; 1937+00 to 1958+00, cutoff wall tip elevation 40'.
D	32	3,100	1958+00 to 1965+80, cutoff wall tip elevation 40'; 1965+80 to 1986+80, cutoff wall tip elevation 58'; 1986+80 to 1989+00, cutoff wall tip elevation 10'.	1958+00 to 1982+00, 6'-tall drained stability berm on 120'-wide undrained seepage berm (6' thick at levee toe; 1982+00 to 1989+00, 4'-tall drained stability berm on 50' undrained seepage berm (5' thick at levee toe).	1958+00 to 1971+80, cutoff wall tip elevation 40'; 1971+80 to 1987+25, cutoff wall tip elevation 48'; 1987+25 to 1989+00, cutoff wall tip elevation 10'.

Construction Contract	Reach	Length (feet)	Alternative 1	Alternative 2	Alternative 3
			Flood Management Measure	Flood Management Measure	Flood Management Measure
D	33	13,300	1989+00 to 2000+80, cutoff wall tip elevation 10’; 2000+80 to 2026+80, cutoff wall tip elevation 90’; 2026+80 to 2036+90, cutoff wall tip elevation 20’; 2036+90 to 2086+90, cutoff wall tip elevation 35’; 2086+90 to 2122+00, cutoff wall tip elevation 90’.	1989+00 to 2020+00, 50’-wide undrained seepage berm (5’ thick at levee toe); 2020+00 to 2028+00, 100’-wide undrained seepage berm (5’ thick at levee toe); 2028+00 to 2037+00, 50’-wide undrained seepage berm (5’ thick at levee toe); 2037+00 to 2050+00, 100’-wide undrained seepage berm (6’ thick at levee toe); 2050+00 to 2065+00, connect berms; 2065+00 to 2087+00, 100’-wide undrained seepage berm (6’ thick at levee toe); 2087+00 to 2102+00, 50’-wide undrained seepage berm (5’ thick at levee toe);	1989+00 to 2002+00, cutoff wall tip elevation 10’; 2002+00 to 2016+75, cutoff wall tip elevation 90’; 2016+75 to 2036+75, cutoff wall tip elevation 20’; 2036+75 to 2041+00, cutoff wall tip elevation 53’; 2041+00 to 2067+00, cutoff wall tip elevation 38’; 2067+00 to 2088+00, cutoff wall tip elevation 33’; 2088+00 to 2122+00, cutoff wall tip elevation 90’.
				2102+00 to 2106+00, connect berm across bend; 2106+00 to 2122+00, 60’-wide undrained seepage berm (5’ thick at levee toe); 1989+00 to 2122+00, 4’-tall drained stability berm on top of seepage berms.	
D	34	6,000	2122+00 to 2137+00, cutoff wall tip elevation 90’; 2137+00 to 2148+00, cutoff wall tip elevation 20’; 2148+00 to 2164+00, cutoff wall tip elevation 90’; 2164+00 to 2182+00, cutoff wall tip elevation 50’.	2122+00 to 2182+00, 4’ high drained stability berm on 60’ wide seepage berm (5’ thick at levee toe)	2122+00 to 2137+00, cutoff wall tip elevation 90’; 2137+00 to 2148+00, cutoff wall tip elevation 20’; 2148+00 to 2164+00, cutoff wall tip elevation 90’; 2164+00 to 2182+00, cutoff wall tip elevation 50’.
D	35	4,200	2182+00 to 2224+00, cutoff wall tip elevation 55’.	2182+00 to 2199+00, 65’-wide undrained seepage berm (5’ thick at levee toe); 2199+00 to 2203+00, connect berm across bend; 2203+00 to 2224+00, 5’-tall drained stability berm on 65’-wide undrained seepage berm (5’ thick at levee toe).	2182+00 to 2196+50, cutoff wall tip elevation 40’; 2196+50 to 2212+00, cutoff wall tip elevation 45’; 2212+00 to 2218+25, cutoff wall tip elevation 50’; 2218+25 to 2224+00, cutoff wall tip elevation 55’

Construction Contract	Reach	Length (feet)	Alternative 1	Alternative 2	Alternative 3
			Flood Management Measure	Flood Management Measure	Flood Management Measure
D	36	3,500	2224+00 to 2259+00 Cutoff, Wall Tip Elevation 75’	2224+00 to 2227+00, 5’ tall drained stability berm on 65’ wide undrained seepage berm (5’ thick at levee toe); 2227+00 to 2233+00, connect berms across bend; 2233+00 to 2259+00, 4’ tall drained stability berm on 300’ wide undrained seepage berm (7.5’ thick at levee toe)	2224+00 to 2233+50, cutoff wall tip elevation 55’; 2233+50 to 2245+75, cutoff wall tip elevation 70’; 2245+75 to 2259+00, cutoff wall tip elevation 42’.
D	37	3,100	Cutoff wall tip elevation 45’.	6’-tall drained stability berm on 65’-wide undrained seepage berm (5.5’ thick at levee toe).	2259+00 to 2277+00, cutoff wall tip elevation 42’; 2277+00 to 2290+00, cutoff wall tip elevation 45’
D	38	1,300	Cutoff wall tip elevation 45’	De-grade and reconstruct levee with zoned filter at base and 300’ wide drained seepage berm (5’ thick at levee toe) with filter carried through berm	2290+00 to 2292+00 cutoff wall to elevation +45’. 2290+00 to 2303+00 construct 11’ high seepage berm, 50’ wide at the top and 170’ wide from levee centerline.
D	39	1,600	2312+10 remove 24-inch storm drain pipe.	2312+10 remove 24-inch storm drain pipe.	2312+10 remove 24-inch storm drain pipe.
D	40	4,000	2319+00 to 2336+90, cutoff wall tip elevation 50’; 2336+90 to 2359+00, cutoff wall tip elevation 20’.	2321+00 to 2332+00; fill landside pit (up to elevation 120’); 2321+00 to 2329+00, 7’ tall drained stability berm on 65’-wide undrained seepage berm (5’ thick at levee toe); 2333+00 to 2343+00, fill landside pits; 2331+00 to 2346+00, 10’-tall drained stability berm on 120’-wide undrained seepage berm (5’ thick at levee toe); 2346+00 to 2359+00, 4’-tall drained stability berm on 300’-wide undrained seepage berm (5’ thick at levee toe).	2321+00 to 2332+00; Fill Landside Pit (up to Elevation 120’); 2321+00 to 2329+00, 7’ tall Drained Stability Berm on 65’ wide Undrained Seepage berm (5’ thick at levee toe); 2333+00 to 2343+00, fill landside pits; 2331+00 to 2335+00 construct 120’-wide seepage berm; 2335+00 to 2359+00 100’-wide seepage berm. Berms are 9’ thick at the levee toe and 3’ thick at the berm toe.

Construction Contract	Reach	Length (feet)	Alternative 1 Flood Management Measure	Alternative 2 Flood Management Measure	Alternative 3 Flood Management Measure
D	41	900	Cutoff wall tip elevation 20' at 2359+00 and 70' at 2368+00 (constantly decreasing depth).	70'-wide undrained seepage berm (5' thick at levee toe) with drainage relief trench along berm toe (50' wide at grade, 12' deep, with 1.5:1 side slopes, filled with drain gravel and a filter zones adjacent in-situ soils.	2359+00 to 2368+00, construct 100'-wide seepage berm with 1'-thick drain layer; ~~2360+00; fill waterside pit.(up to Elevation 130')~~

kv = kilovolt.

2.2.4 Alternative Descriptions

2.2.4.1 Alternative 1

Alternative 1 would construct a cutoff wall along the centerline of the existing levee to a varying depth and a seepage berm along a portion of the landside levee toe.

For Reaches 2 through 5, Alternative 1 would construct a cutoff wall ranging between 30 feet and 127 feet in depth along the centerline of the levee. The levee would be degraded approximately 50% of its overall height with 2,900 feet of the levee being fully degraded. Cutoff wall construction would be completed as described under Section 2.5.1.2. In addition to the cutoff wall, Alternative 1 would construct a 200-foot wide seepage berm for 2,268 feet. Seepage berm construction would be completed as described under Section 2.5.6.2.

For Reaches 7 through 11, Alternative 1 would construct a cutoff wall ranging between 39 feet and 124 feet in depth along the centerline of the levee. The levee would be degraded approximately 50% of its overall height with 1,900 feet of the levee being fully degraded. SBFCA would acquire a temporary construction easement equal to 50 feet from the existing levee toe or toe of the proposed seepage berm for construction of the levee improvements. An additional 20-foot easement would be obtained where required for the relocation of existing utilities.

For Reaches 13 through 24, Alternative 1 would construct a cutoff wall ranging between 21 and 105 feet in depth along the centerline of the levee. The levee would be degraded approximately 50% of its overall height with approximately 2,600 feet of the levee being fully degraded. In addition to the cutoff wall, Alternative 1 would include approximately 11,150 feet of waterside slope flattening, approximately 5,100 feet of depression infill and approximately 1,500 feet of ditch lining. The slope flattening, depression/ditch infilling, and ditch lining construction would be constructed as described in Sections 2.5.2.2, 2.5.8.2, and 2.5.9.2, respectively.

For Reaches 26 through 41, Alternative 1 would construct a cutoff wall ranging between 18 feet and 97 feet in depth along the centerline of the levee. The levee would be degraded by approximately 50% of its overall height.

Materials imported to the project site would include water, bentonite, cement, incidental construction support materials, aggregate base rock, hydroseed, and up to 1,902,150 cubic yards of embankment fill material for the new levee surfaces from offsite commercial borrow sites. For backfill of new pipelines crossing the levee, Controlled Low Strength Material (CLSM) (otherwise known as light-weight concrete) is required to be placed to the pipeline's spring line.

2.2.4.2 Alternative 2

Alternative 2 would construct seepage and stability berms along the landside toe of the levee and a shallow cutoff wall along a portion of the centerline of the levee. In addition, Alternative 2 would include the filling of the existing canal adjacent to the levee in Reaches 22, 24, 26, 27, 28 and 31 with water during periods of high water surface elevation in the river. This would require the construction of regulating structures within the canal to maintain the water level within the canal as described under Section 2.5.11.2.

For Reaches 2 through 5, Alternative 2 would construct an undrained seepage berm ranging between 100 feet and 300 feet in width along the landside toe of the levee. Seepage berm construction would be completed as described under Section 2.5.6.2. Additionally, an 8-foot high stability berm would be constructed along 20,817 feet of the project. Stability berm construction would be completed as described under Section 2.5.3.2. Also, a shallow cutoff wall 20 feet in depth would be constructed along the levee centerline for 1,616 feet of the project. The levee would be degraded approximately 50% of its overall height. Cutoff wall construction would be completed as described under Section 2.5.1.2.

For Reaches 7 through 11, Alternative 2 would construct an undrained seepage berm ranging between 110 feet and 300 feet in width along the landside toe of the levee. A stability berm approximately 9.5 feet tall would be constructed along 14,163 feet of the project. Also, a shallow cutoff wall ranging between 23 feet and 35 feet in depth would be constructed along the levee centerline for 17,800 feet of the project. A portion of the existing Garden Highway would need to be removed and reconstructed to allow construction of the seepage berm.

For Reaches 13 through 24, Alternative 2 would construct an undrained seepage berm ranging between 70 feet and 300 feet in width along the landside toe of the levee. An 8- to 10-foot high stability berm would be constructed along approximately 24,200 feet of the project. A shallow cutoff wall 20 feet in depth would be constructed along the levee centerline for approximately 14,700 feet of the project. Relief wells would be installed for approximately 37,400 feet of the project. To facilitate construction of the cutoff wall and to maintain stability of the levee, the levee would be degraded by approximately 50% of its overall height.

For Reaches 26 through 41, Alternative 2 would construct an undrained seepage berm ranging between 50 feet and 300 feet in width along the landside toe of the levee. A 4- to 10-foot-tall stability berm would be constructed along approximately 38,600 feet of the project. Approximately 1,300 feet of the existing levee would need to be removed and reconstructed with a zoned filter at the base in combination with a seepage berm. Levee reconstruction would be completed as described in Section 2.5.4.2.

Materials imported to the project site would include water, bentonite, cement, incidental construction support materials, aggregate base rock, hydroseed, and up to 7,245,200 cubic yards of embankment fill material for the new levee surfaces from offsite commercial borrow sites. For

backfill of new pipelines crossing the levee, CLSM is required to be placed to the pipeline's spring line.

2.2.4.3 Alternative 3

As introduced previously, Alternative 3 is the APA, combining mitigation measures from both Alternative 1 and Alternative 2 to produce the optimized alternative based on screening criteria.

For Reaches 2 through 5, Alternative 3 would construct a cutoff wall ranging between 20 feet and 127 feet in depth along the centerline of the levee. The levee would be degraded approximately 50% of its overall height. Cutoff wall construction would be completed as described under Section 2.5.1.2. In addition to the cutoff wall, Alternative 3 would construct a 100-foot wide seepage berm for 1,616 feet and a 200-foot wide seepage berm for 2,268 feet. Seepage berm construction would be completed as described under Section 2.5.6.2.

For Reaches 7 through 11, Alternative 3 would construct a cutoff wall ranging between 39 feet and 124 feet in depth along the centerline of the levee. Relief wells with 60 feet spacing and 50 feet in depth would be distributed at various locations in Reach 7.

For Reaches 13 through 24, Alternative 3 would construct a cutoff wall ranging between 21 and 105 feet in depth along the centerline of the levee. The levee would be degraded by approximately 50% of its overall height with approximately 2,600 feet of the levee being fully degraded. In addition to the cutoff wall, Alternative 3 would include approximately 5,100 feet of depression infill which would be constructed as described in Section2.5.8.2.

For Reaches 26 through 41, Alternative 3 would construct a cutoff wall ranging between 18 feet and 97 feet in depth along the centerline of the levee. The levee would be by degraded approximately 50% of its overall height. Approximately 1,300 feet of levee would be degraded and reconstructed with a 5 to 1 slope (horizontal to vertical). Levee reconstruction would be completed as described under Section 2.5.4.2. Reconstruction of the SBC embankment slope nearest the levee would occur in Reaches 26, 27, and 28. This activity would remove approximately 7,500 to 10,000 cubic yards of material by excavator from the top of the slope over a length of 9,484 feet of the canal, effectively laying back the canal slope. While considered dredging from a regulatory standpoint because it involves excavation below the ordinary high water mark, the work would take place when the canal is dry, either during the time of year when it is typically dry because it is not in operation for irrigation water deliveries or via not allowing it to fill.

Reach 31 includes cutoff walls as described in Section 2.5. In Reach 38 an 11-foot high and 170-foot wide (from the levee centerline) seepage berm would be constructed as described in Section 2.5.6. In Reach 41, a 100-feet wide drained seepage berm would be constructed as described in Section 2.5.6.2. The seepage berm would include a 1-foot thick filter drain along the bottom. The filter drain would provide drainage for seepage through the levee. The existing concrete outfall structure located at the south end of this reach would remain in place and would be backfilled with earth materials. ~~This alternative would also include filling of the waterside pit located at the south end of Reach 41. The pit is approximately 200-feet by 80-feet at the bottom and 20-feet deep.~~ A 30-foot wide construction access area would be provided at the toe of the seepage berm.

Approximately 9,500 feet of canal would be kept in place and monitored with a Flood Safety Plan as discussed in Section 2.5.11.2.

Materials imported to the project site would include water, bentonite, cement, incidental construction support materials, aggregate base rock, hydroseed, and up to 1,934,400 cubic yards of embankment fill material for the new levee surfaces from offsite commercial borrow sites. For backfill of new pipelines crossing the levee, CLSM is required to be placed to the pipeline's spring line.

2.3 Common Elements, Assumptions, and Commitments for All Action Alternatives

Though the alternatives vary, several common elements and assumptions are shared among each and are described below.

These elements include environmental commitments, which are measures incorporated as part of the project, meaning they are proposed as elements that apply to each and all action alternatives and are to be considered in conducting the environmental analysis and determining effects and findings. The purpose of environmental commitments is to reflect and incorporate best practices into the project that avoid, minimize, or offset potential environmental effects. These best practices tend to be relatively standardized and compulsory; they represent sound and proven methods to reduce the potential effects of an action. The rationale behind including environmental commitments is that the project proponent commits to undertake and implement these measures as part of the project in advance of effect findings and determinations in good faith to improve the quality and integrity of the project, streamline the environmental analysis, and demonstrate responsiveness and sensitivity to environmental quality.

2.3.1 Project Footprint and Land Acquisition

Throughout the project length, the State and/or local levee maintaining agencies hold various easements and fee rights to the land beneath and adjacent to the Feather River West Levee. Due to the age of the system, and the numerous projects to upgrade the levee system over the years, the land rights vary significantly throughout the project. One objective of the project is to, where feasible, upgrade these rights so that the State and local maintaining agencies have appropriate and consistent land rights throughout the length to construct the project and to operate and maintain the levee system. To this end, SBFCA would coordinate with the CVFPB and DWR to attempt to acquire 15 feet on the waterside of the levee and up to 30 feet on the landside in areas which are undeveloped. In developed areas, SBFCA would seek to acquire right-of-way to the extent necessary to facilitate construction of the project. For temporary construction purposes, SBFCA would seek to acquire an additional 10 feet landside of the levee in areas where orchards or other continuous obstructions are not present. Where the current rights beneath or adjacent to the levee are currently owned as an easement, the project would attempt to upgrade the rights to fee ownership in most cases.

In undeveloped areas, for the landside right-of-way, the 30 feet to be obtained landward of the levee, seepage berm, or other facility, existing trees, and encroachments would be removed to the extent necessary to facilitate construction of the project and to support long-term ~~operations and maintenance~~O&M activities. The outer 10 feet would be acquired only as an easement and allowed to return to agricultural use following construction. In developed areas, encroachments would be removed if they are deemed by SBFCA to pose a threat to levee integrity.

Each alternative may require land acquisition to accommodate the footprint of the project for measures such as relief wells, seepage berms, slope flattening, and stability berms. The land within the footprint, which includes the proposed flood risk–reduction measure and the waterside and landside O&M easements, would be acquired to prevent encroachment into the flood management~~protection~~ corridor. Permanent acquisition, relocation, and compensation services would be conducted in compliance with Federal and state relocation laws, which are the Uniform Act of 1970 (42 USC 4601 et seq.) and implementing regulation, 49 CFR Part 24; and California Government Code Section 7267 et seq. These laws require that appropriate compensation be provided to displaced landowners and tenants, and that residents be relocated to comparable replacement housing.

2.3.2 Relocations, Demolition, and Removals

Existing facilities found within the footprint of an alternative may require removal and replacement nearby, abandonment, or relocation. Encroachments are numerous along the Feather River West Levee and may need to be addressed if they present either a threat to the stability of the levee, do not currently comply with the levee encroachment criteria, or would be disrupted or otherwise affected by construction activities. Of the over 400 identified encroachments in the affected area, some have been reviewed and permitted by the CVFPB, some are included in the as-builts of the original project, while others have an unknown status. Typical encroachments include pressure pipelines (water supply pipelines from waterside pump stations and drainage pipelines from landside drainage pump stations), gravity drainage pipes, gas lines, telephone utilities, overhead utilities, structural encroachments, and other types and variations.

Vegetation removal would involve stripping of herbaceous (non-woody) vegetation by bulldozer. Removal of woody vegetation would be as described in Section 2.5.10, *Encroachment Removal and Vegetation Policy Compliance*. Vegetation would be removed only from within the direct construction footprint and the minimum areas necessary for staging and access.

Debris from structure and vegetation removal and embankment fill material of poor quality would be hauled off site to a permitted disposal site within 20 miles of the removal location.

The work items identified in Table 2-5 are known relocations, demolitions, and removals, categorized as described below.

- **Pipe crossing replacements** are existing pipelines for landside drainage, water supply, or wastewater or sewer that are located under or in the levee prism, perpendicular to the levee. For the identified locations, they would be replaced in-kind in accordance with current design standards for levee penetrations.
- **Adjacent pipe relocations** are existing pipelines for landside water supply or wastewater or sewer that are located to the landside of the levee toe, parallel to the levee. For the identified locations, they would be replaced in-kind approximately 30 feet landward from the levee toe.
- **Well relocations** are replacements of existing irrigation wells, typically caused by construction of a seepage berm. The wells would be replaced in-kind landward of the berm or levee toe.
- **Pipe crossing removals** are for pipelines similar to those described for pipe crossing replacements with the exception that they would not be replaced; they are complete demolition and removals.

- **Water wells or pipe crossings** are existing water supplies for which the determination has not yet been made for replacement type. They may be the development of a new water well or extension of a pipeline to replace the pre-project water supply. The determination would be made in coordination with the owner.
- **Structure demolitions** are vertical aboveground elements that would be demolished and removed.

Table 2-5. Relocation, Demolition, and Removal Items

Construction Contract	Reach	Station #	Work Item
Pipe Crossing Replacements			
C	16	972+00	2-Inch Water Pipe
C	16	988+50	Remove 3-Inch Pipe
C	16	1020+85	Remove 4-Inch Pipe
C	16	1043+52	Remove 27-Inch Pipe
~~C~~	~~16~~	~~1073+41~~	~~PG&E 12-Inch Gas Line~~
D	29	1777+00	Waller 24-Inch SD Pipe
D	29	1785+24	24-Inch SD Pipe
D	29	1785+55	24-Inch SD Pipe
D	29	1792+96	24-Inch SD Pipe
D	29	1809+65	24-Inch SD Pipe
Adjacent Pipe Relocations			
A	4	396+50 to 409+00	Feather Water District 42-Inch Main
A	4	396+50 to 409+00	Taylor Brothers 15-Inch Main
A	4	409+00 to 430+00	Taylor Brothers 15-Inch Main
B	8	596+00 to 642+00	Sierra Gold 12-Inch Main
C	20	1349+00 to 1375+00	Filter Irrigation Pipe
D	30	1888+50	Housing Authority 6-Inch Waste Water Main
Well Relocations			
A	3	241+75	GHMWC Water Well #18 Relocation
A	3	219+00	GHMWC Water Well #19 Relocation
A	3	274+50	GHMWC Water Well #22 Relocation
A	3	298+67	GHMWC Water Well #23 Relocation
A	4	407+72	Taylor Brothers IR Water Well Relocation
B	8	603+50	Sierra Gold Nursery IR Water Well
B	8	638+20	Sierra Gold Nursery IR Water Well
B	9	655+50	Irrigation Water Well
B	9	669+20	Sierra Gold Nursery IR Water Well
B	9	688+90	OMWC IR Water Well
C	18	1174+05	Wilbur Ranch Water Well
C	18	1200+69	Wilbur Ranch Water Well
D	33	2006+05	Irrigation Water Well
D	35	2208+56	Irrigation Water Well
Pipe Crossing Removals			
B	11	828+55	24-Inch Sewer Pipe

Construction Contract	Reach	Station #	Work Item
B	12	832+20	24-Inch Sewer Pipe
B	12	832+25	24-Inch Sewer Pipe
C	16	1043+03	Gilsizer SD 16-Inch Pipe
C	16	1043+22	Gilsizer SD 24-Inch Pipe
C	16	1043+27	Gilsizer SD 24-Inch Pipe
C	16	1043+45	Gilsizer SD 36-Inch Pipe
D	39	2312+05	24-Inch SD Pipe
Water Wells or Pipe Crossings (to be determined)			
C	19	1229+41	Richland Enterprise
C	19	1265+59	Kewall Singh
D	28	1765+15	Pamma
D	30	1834+42	Farmland
D	33	2004+86	Mariani
D	37	2283+44	Fredricks
D	40	2345+79	Irrigation Pipe
Structure Demolitions			
C	16	989+50	Residential Garage
C	16	990+50	Residential Structure
C	16	990+75	Residential Structure
C	16	992+75	Residential Shed
C	16	995+00	Parking Structure
C	22	1482+25	Barn
C	22	1484+00	Barn
C	22	1485+00	Residential Home
C	23	1556+00	Utility Barn
C	24	1611+00	Utility Barn
C	24	1612+25	Residential Home
D	28	1738+50	Residential Home
D	31	1955+75	Structure
D	31	1956+00	Residential Trailer
D	31	1956+00	Silo/Fuel Tank
D	31	1956+50	Tank
D	31	1957+25	Structure
D	31	1957+50	Fuel Pumps

SD = storm drain.

2.3.3 Pacific Gas and Electric Company Activities

Additionally, ~~prior to and/or concurrent with levee rehabilitation construction,~~ construction of the FRWLP will require PG&E ~~will~~ to remove and relocate existing transmission and distribution lines and gas transmission and distribution pipelines located within the footprint of the FRWLP. Relocations will typically fall within the project footprint, but in some cases PG&E facilities would be relocated greater than100 feet from the levee or berm toe.

PG&E's utility relocations will need to occur in advance of SBFCA's construction activities at any given location. Construction sequencing for SBFCA's work will be dynamic throughout SBFCA's project planning and design. PG&E's construction schedule will be determined by further engineering to clarify and determine efficacy of site-specific measures; the availability of funding for FRWLP; easement and right-of-way acquisition; availability of borrow material for the levee improvement activities; and/or environmental clearances based on wildlife presence, lifecycle activity, and location of habitats. PG&E's construction schedule will be further influenced by utility O&M constraints, particularly for relocation activities that require taking existing facilities temporarily out of service.

As necessary, geotechnical mitigation measures will be incorporated into construction design to ensure that utility facilities effectively co-exist with the FRWLP. PG&E and USACE will work together to ensure the relocation of gas and electric facilities will not impact levee performance.

For PG&E's electrical transmission and distribution activities, PG&E will install and remove new electrical transmission and distribution poles. Electrical transmission and distribution pole removal will typically be conducted by a line crew, which typically access each pole site with a line truck and trailer or a boom truck except in those instances when the pole is located on the levee crown; a crane may be used in those instances.

On average, removal of vegetation up to 30 feet from the toe of the levee will need to occur to accommodate pole installation activities; this figure may be greater in instances where PG&E installation is located further than 30 feet from the levee toe.

For PG&E's natural gas transmission and distribution activities, PG&E will install gas transmission and distribution steel pipe. This also typically includes the removal and disposal of existing pipe. Other typical types of gas transmission and distribution equipment that may be installed include Electrical Testing Stations/Cathodic Testing Stations for future pipe monitoring purposes, and pipeline markers at angle points and as levee crossing locations.

Clearing and grading operations in support of installation of natural gas facilities typically involve preparation of the right-of-way (ROW), including vegetation removal, debris disposal, and land leveling. Installation sites are typically backfilled using sand to create an approximately 6 inch insulation zone around the pipe and then typically covered by native soil from the project. In some instances, a crane may be required to place pipe at crossing sites located at the crowns of the levees. Dump trucks are typically utilized to transport sand and soil materials. Spoil piles may be temporarily placed onsite while the installation activities are occurring. Replacing of vegetation within the area of the permanent easement typically has restrictions of trees within 10 feet of the pipeline.

Hydrostatic testing associated with installation of natural gas facilities will typically be performed to test the strength of the new pipeline. Test water intake and discharge will typically be performed in accordance with all regulations and permit requirements.

Typical electrical and natural gas transmission and distribution project work schedules are comprised of an average 9-hour day, at an average of 6 days per week per crew. Typical crews consist of 3 to 5 members.

PG&E work areas are approximately 125 feet by 125 feet in diameter and typically located in close proximity to installation activity locations. On average, PG&E will require up to 10 work areas per

contract phase. PG&E will utilize the work areas identified by SBFCA whenever possible. Typically, PG&E project access is achieved through existing public and private roads.

Removal of vegetation to utilize access roads by PG&E equipment and transport of facilities may be required. Replacement of vegetation within the area of the permanent easement associated with gas transmission and distribution facilities typically restricts trees from being located within 10 feet of the pipeline.

PG&E currently owns easements along the entire project route. However, temporary and/or permanent easements as required for the construction and maintenance of these facilities are being acquired by SBFCA. The locations of the facilities to be relocated by PG&E are shown on Plate 2-3 and a list of PG&E encroachments is provided in Appendix G.~~existing power transmission lines and gas distribution pipelines as required to comply with CVFPB and USACE utility encroachment standards and to facilitate levee rehabilitation construction. Work to be performed by PG&E will include (but not necessarily be limited to) placement of new utility poles and anchors, transfer of existing power transmission lines from existing utility poles to new utility poles, removal of existing utility poles, placement of new gas distribution pipelines, connection of new gas distribution pipelines to existing facilities, and removal of existing gas distribution pipelines. Temporary and/or permanent easements as required for the construction and maintenance of these facilities are being acquired by SBFCA. The locations of the facilities to be relocated by PG&E are shown on Plate 2-3.~~

2.3.4 Construction Staging, Access, and Temporary Facilities

Staging areas would only be provided within the project right-of-way and easement limits. The contractor would be responsible for obtaining all required local, state, and Federal permits for any staging areas outside of these limits. Staging areas would be used for staging construction activities and to provide space to house construction equipment and materials, project offices, employee parking, and other uses needed for project construction.

To facilitate project construction, temporary earthen ramps would be constructed for equipment access between the levee crown and the staging area(s). The earthen ramps would be removed when construction is complete.

Cutoff wall construction requires temporary establishment of an onsite slurry batch plant that would occupy about 1 to 2 acres. Batch plants would be located at approximately 1-mile intervals within the project footprint. The batch plant site would likely contain tanks for water storage, bulk bag supplies of bentonite, bentonite storage silos, a cyclone mixer, pumps, and two generators that meet air quality requirements. The site would also accommodate slurry tanks to store the blended slurries temporarily until they are pumped to the work sites. Slurry ingredients would be mixed with water at the batch plant and the mixture would be pumped from the tanks through pipes to the cutoff wall construction work sites. The batch plant would produce two different slurry mixes, one for trench stabilization and one for the soil backfill mix. Therefore, two slurry pipes or hoses, typically 4- or 6-inch high-density polyethelene pipes, would be laid on the ground and would extend to all work sites. An additional pipe may be used to supply water to the work sites.

Staging, access, and other temporary construction areas would be located away from wetlands, woody vegetated areas, wildlife species habitat, known cultural resources, or other sensitive areas and would be limited to disturbed or ruderal grasslands subject to review by USACE and Federal and state resource agencies.

2.3.5 Property Access Limitations, Disturbances, and Service Disruptions

2.3.5.1 Public Use Areas

For public use areas, SBFCA would ensure that the contractor posts notice of construction activities and intended days of construction area closure at least 30 days in advance of closures in and near public use areas. The contractor would post notice of construction activities and closures at least 10 days in advance in all other areas. Notice should be posted adjacent to access roads, and signs would be at least 3 square feet in size and provide a contact for questions regarding project construction. SBFCA also would ensure that the construction area is fenced off to keep members of the public out of harm's way.

SBFCA would ensure that access to any public boat launch facilities is maintained to the greatest degree possible during construction of levee improvements. If access restrictions cannot be avoided, SBFCA would post notice regarding the location of alternative boat launch facilities at least 30 days in advance of closure and would ensure that closure time is minimized and/or provide alternate access routes to the facilities. See recreation analysis in Section 3.14 for further discussion.

2.3.5.2 Private Property

For private areas, during some periods of time, construction activities would be directly adjacent residences, business, and agricultural properties. Information related to any future construction activities would be available by calling the project hotline at (530) 870-4425 or by visiting the project web site at http://sutterbutteflood.org.

For noise and vibration disturbance, SBFCA would require the construction contractor to follow noise-reducing construction practices such that noise from construction does not exceed applicable jurisdictional noise ordinance limits or, at a minimum, implements measures to reduce noise to acceptable levels. Measures that can be used to limit noise may include but are not limited to the following actions.

- Locating equipment as far as practical from noise-sensitive uses.
- Using sound control devices such as mufflers on equipment.
- Using equipment that is quieter than standard equipment.
- Using noise-reducing enclosures around noise-generating equipment.
- Provide for temporary relocation if noise exceeds acceptable levels for an extended duration (as discussed below).

In some cases, construction may result in temporary disruption of utilities (water, telephone, electricity, gas, and sanitary sewer) or loss of vehicle or pedestrian access could occur for durations too lengthy for convenient day-to-day living and/or construction-related noise may occur outside ordinance limits. Disruptions in service would be up to four hours per episode for electrical, communications, and gas and up to 8 hours per episode for water and sanitary sewer. Access by auto and by foot would be maintained, subject to detour and periodic closure (less than 4 hours). If necessary, SBFCA would provide assistance for residents to relocate during construction activities and provide compensation to residents for reasonable rent and living expenses incurred due to

relocation. In accordance with the Uniform Relocation Assistance and Real Property Acquisition Act, residents would be provided with decent, safe, and sanitary housing.

SBFCA would develop a Temporary Resident Relocation Plan to guide temporary relocation services and compensation, and at a minimum would ensure all compensation and relocation activities are conducted in compliance with Federal and state relocation laws.

2.3.5.3 Temporary Road and Railroad Closures, Traffic Control, and Road Maintenance

SBFCA, in coordination with relevant city and county public works departments, would develop and implement a traffic control plan(s) for the proposed project. A traffic control plan describes the methods of traffic control to be used during construction. All on-street construction traffic would be required to comply with the local jurisdiction's standard construction specifications. The plan would reduce the effects of construction on the roadway system in the project area throughout the construction period. Construction contractors would follow the standard construction specifications of affected jurisdictions and obtain the appropriate encroachment permits, if required. The conditions of the encroachment permit would be incorporated into the construction contract and would be enforced by the agency that issues the encroachment permit.

Road closures may be of varying duration, measured in hourly periods or up to several weeks in some instances. Proposed lane closures during the AM and PM commuting hours would be coordinated with the appropriate jurisdiction and minimized during the morning and evening peak traffic periods. Commuters would be notified of the construction schedule to help avoid potential disruptions. Standard construction specifications also typically limit lane closures during commuting hours. Lane closures would be kept as short as possible and detour signage, if detours are available, would be posted around construction sites. Advance notice signs of upcoming construction activities would be posted at least 1 week in advance so that road and rail users are able to avoid traveling through the construction area during these times or at least aware of inconveniences.

Safe pedestrian and bicyclist access, if any exists on the current roadway, would be maintained in or around the construction areas at all times. Construction areas would be secured as required by the applicable jurisdiction to prevent pedestrians and bicyclists from entering the work site, and all stationary equipment would be located as far away as possible from areas where bicyclists and pedestrians are present. SBFCA would notify and consult with emergency service providers to maintain emergency access and facilitate the passage of emergency vehicles on city streets.

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

SBFCA would coordinate with the local jurisdictions prior to starting any construction activities to determine if any other projects would disrupt traffic or require detours affecting the same roads. If so, SBFCA would modify haul routes, timing, or otherwise work with the local jurisdictions and other project proponents to minimize cumulative disruptions to roadways.

The traffic control plan would also include the information listed below.

- A street layout showing the location of construction activity and surrounding streets to be used as detour routes, including special signage.
- A tentative start date and construction duration period for each phase of construction.
- The name, address, and emergency contact number for those responsible for maintaining the traffic control devices during the course of construction.

Additionally, the traffic control plan would include the stipulations listed below.

- Access for driveways and private roads would be maintained, except for brief periods of construction, in which case property owners would be notified.
- Traffic controls may include flag persons wearing Occupational Safety and Health Administration-approved vests and using a Stop/Slow paddle to warn motorists of construction activity.
- Access to transit services would be maintained and public transit vehicles would be detoured.
- Contractors would be informed in writing of appropriate routes to and from construction sites, and weight and speed limits for local roads used to access construction sites. All such written notifications would be submitted to the local jurisdiction's planning department.

SBFCA would assess damage to roadways used during construction and would repair all potholes, fractures, or other damages. Silt fences, straw wattles, and stabilized construction entrances/exits would be implemented to control mud and dirt from spilling on streets.

In addition to roadway issues, SBFCA would coordinate directly with railroad officials regarding the timing of temporary railroad closures and/or removals as necessary during program implementation. SBFCA would ensure minimization of any disruption to service by utilizing the most recent and available construction methods to expedite activities. Because the temporary loss of service along some railroads could result in financial loss for various companies that use the rail lines, SBFCA would ensure that the appropriate entities are compensated for monetary losses attributed to the reduction in rail service.

2.3.6 Material Importation, Reuse, and Borrow

Materials imported to the project site would include water, bentonite, cement, incidental construction support materials, aggregate base rock, asphalt, concrete, hydroseed, and embankment fill soil. Each alternative would require the use of large quantities of fill soil, or borrow. To meet borrow demands, embankment fill material excavated as part of construction would be evaluated for reuse. Embankment fill material deemed suitable would be used as part of levee reconstruction and berms.

2.3.6.1 Borrow Volume

Depending on the alternative, the total volume of material required ranges from 1,902,150 to 7,245,200 cubic yards. The quantities were calculated assuming a 20% shrinkage factor between excavation at the borrow site and placement at the levee. Only material suitable for placement in levee construction may be borrowed for the project (HDR et al. 2012). These materials are identified as low to medium plasticity soils classified in accordance with American Society for Testing and

Materials (ASTM) D 2487 as silty sand and clayey sand (SM or SC), silt (ML), or clay (CL or CH). The materials should have a Liquid Limit (LL) less than or equal to 45 (may be extended up to 55 with justification and approval from the USACE and the CVFPB), a Plasticity Index (PI) greater than or equal to 8 and less than 40, and a fines content greater than or equal to 30%. Material borrowed for the levee core would contain fines in excess of 50%. The material should be free from visible organics and be no greater than 2 inches in any dimension.

2.3.6.2 Borrow Site Selection Factors

SBFCA's first choice for fill or borrow material would be from a local commercial quarry or other permitted source. In the event that material is desired from a source that is not presently permitted, for reasons such as quality, proximity, or volume available, SBFCA would implement soil supply protection measures. One such measure would be maximizing on-site use through gradation, placement, and treatment. Another measure would be the preservation and replacement of topsoil at borrow sites, so that they could be continued to be used for their current use or otherwise returned to their pre-project condition. As part of borrow operations, the upper 12 inches of topsoil would be set aside and replaced after project construction in each construction season. After the project is completed, the borrow site would be re-contoured and reclaimed. An additional measure would be independent environmental documentation and regulatory compliance, as required. Specific regulations related to soil resources are detailed in Section 3.3.2.1 and Appendix A, *Regulatory Background*.

Factors determining borrow sources and sites are (followed by a description of each factor and discussion of potential borrow sources).

- Hauling distance and haul route
- Depth to groundwater
- Royalty fees
- Post-construction land use
- Environmental factors

Hauling Distance and Routes. The cost for borrow site excavation and hauling is directly related to the distance required to haul the material and the route by which the materials must be transported. To the extent possible, sites should be selected that minimize haul route length and the use of public roadways (Wood Rodgers2011).

Depth to Groundwater. Because the top layer of a borrow site must be removed and stockpiled to exclude organics from the borrow material, it is economical to maximize the depth of the excavation. This maximum depth is typically governed by the normal seasonal depth of groundwater. Once excavation extends to within a few feet of the groundwater table, additional expense is incurred to implement dewatering at the site. Groundwater elevations generally fluctuate throughout the year and can be influenced by standing water or irrigation activities on adjacent lands. Typically, groundwater depths are higher at the beginning of spring, and become deeper toward the end of summer (Wood Rodgers 2011).

Royalty Fees. Royalty fees for material excavated directly affect the cost of the borrow and also typically trigger more substantial permitting requirements. It is desirable to find a property owner who wishes to have excavation carried out for his own purposes, such as creating a detention basin

to support future development, so that royalty fees and a SMARA permit are avoided (Wood Rodgers 2011).

Post-Construction Land Use. The post-construction use of the property can also effect the depth of excavation. Borrow sites must be free draining after the material is excavated, and therefore cannot be extended deeper than the offsite drainage facilities can accommodate(Wood Rodgers 2011).

Environmental Factors. Environmental factors, including the need for mitigation for special-status species and wetlands encroachments, are also a factor in selecting borrow sites. Consideration should also be given to haul routes when evaluating environmental effects. Routes which could be unavailable during the early months of the construction season due to the presence of nesting raptors should be avoided (Wood Rodgers 2011). If waterside borrow sites outside the construction footprint are needed, only sites that do not impact woody vegetation associated with fish-inhabited waters should be considered. All sites will be surveyed for potential wildlife habitat, jurisdictional waters, cultural resources, and other environmental regulatory triggers prior to use, and environmental documentation and permits will be secured independently or supplemental to the FRWLP documentation and permits.

2.3.6.3 Potential Borrow Sites

Potential borrow sites have been identified in the project area and each are summarized below. An investigation of each of the identified sites was based upon the quantity of available material, hauling distance, material composition, groundwater elevation, and prospects for acquisition. The purpose of the investigation is to identify the sites with the greatest potential to provide material economically for the project. Economical hauling has been determined to be within a 2-miles radius and marginally economic hauling within a 10-mile radius. Borrowing outside radius is not recommended and additional sites would be identified to supply material within these limits.

As a result of the borrow analysis, sufficient fill volume was generally determined to range from immediately adjacent to the levee improvement to approximately a 10-mile round-trip haul distance from the area of construction. Borrow source sites, material reuse, and importation associated with each alternative are described in more detail under the alternative descriptions and in relevant resource chapters.

~~If all of the material available at each of the identified sites was determined to be geotechnically suitable, the sites could provide up to 2.7 million or 180% of the total target volume. Preliminary indications are that the approximately 50% of the material at the borrow sites would be suitable for use as levee fill on the project.~~ Additional sites may need to be identified to provide sites with a greater potential to yield material meeting levee fill requirements, and to provide sites closer to the levee. SBFCA would be responsible for the independent environmental review if new unpermitted borrow sources are needed. Borrow sites would not have a USACE trigger unless there is a 404 action.

Through outreach efforts, SBFCA identified a number of sites owned by individuals or government agencies willing to sell their property or provide material on a cubic yard basis. Plate 2-2 illustrates each of the properties identified thus far, and a description of each is outlined below.

Oroville Wildlife Area Dredge Tailings Area

This site is within the Oroville Wildlife Area (OWA) and consists of several mounds of dredge tailings waterward of the existing levee. The material is suitable for use in seepage berms at Reaches 40 and 41. The availability of tailings in the area should be sufficient to meet the total deficit for berm material in these reaches. The excavation of the material would be coordinated to maximize hydraulic benefits from the reshaping of the overbank area. The site also represents an opportunity to provide waterside habitat enhancements. The area of this this site could be approximately 75 acres. The depth of excavation could be upwards of 10 feet. The yield of material from this site could be 375,000 cubic yards. Hauling from this site would not take place on public roads. It is anticipated the contractor would use an existing waterside levee ramp (or create one), directly accessing the levee patrol road. The future land use for this site would be similar to its present day use (managed habitat area).

City of Live Oak ~~City~~ Detention Basin

The City of Live Oak owns the property formerly known as the Caltrans Detention Basin Site located west of SR 99 and south of Paseo Avenue. The site is currently fallow. The City of Live Oak intends to construct soccer fields and a stormwater detention basin at the site in 2013 or later. Although the site would require hauling for a short distance through a residential neighborhood, it is anticipated the residents would be amenable to the hauling as it would be a part of the public amenity constructed by the City of Live Oak. The material at this site is anticipated to be lean clay (CL) from a depth of 1 to 2.5 feet, followed by more sandy material to a depth of 6 feet. This site is approximately 25 acres and the depth of excavation is anticipated to be 3–6 feet. The yield of material from this site could be 125,000 cubic yards, and would likely be used for Contract C. The haul route to the northern portion of Contract C from the City of Live Oak Detention Basin would be west crossing the canal to north to Treatment Plant Access road and west on Treatment Plant Access Road to north on Farm Access Road to north on Richards Avenue to east on Pennington Road. Additional access routes to the levee from eastbound on Pennington Road are south on SR 99 to east on Paseo Avenue and north on Metteer Road to east on Riviera Road. Additional routes to the levee along northerly Metteer Road would be east on Campbell Road and east on Cooley Road.

~~The haul route would be from the site along Linda Street, to Allen Street, to Larkin Road, to Broadway, to Elm Street, to Larkin Road, to Pennington Road. The levee would be accessed at Pennington Road. The post-project use of the site would be a community park and stormwater detention basin facility.Lanza 235-Acre Borrow SourceDavid Lanza is seeking to acquire this 235-acre property near Township Road and Schroeder Road southeast of the City of Live Oak. The property is currently planted in rice. The potential owner wishes to construct an agricultural water holding pond on the property, and may be agreeable to lowering large portions of the property to obtain additional material. Mr. Lanza has indicated that the total quantity of material available would depend on the price negotiated (the more material sold, the lower the unit cost). Initial investigations indicate this site has Type 1 material in the upper 3 feet. Groundwater at this location is as shallow as 5 feet below the surface. The area used for borrow at this site would be determined following the completion of geotechnical investigations and negotiations with the landowner. It is possible a large portion of it (100 acres) could be excavated uniformly to a depth of up to 3 feet. The yield of material from this site could be 250,000 cubic yards. A smaller area could also be excavated to a deeper extent to provide material. The haul route from this site would be Township Road to Pennington Road, accessing the levee at Pennington Road. The post-project land use would be rice~~

~~production. Should a deeper excavation over a smaller area occur on the property, an agricultural return water storage pond may be constructed at the site.~~

~~Nevis 40-Acre Property~~

~~The Nevis property is located at Township and Clark Roads southeast of the City of Live Oak. The site is currently planted in rice. The owner is interested in either selling borrow material to SBFCA or selling the property outright. Initial investigations indicate that the site is underlain by approximately 2.5 feet of fat to lean clay, with greater than 50% passing the No. 200 sieve, Plasticity Index tests ranging from 16 to 39, and Liquid Limits between 24 and 54. Most of this material will qualify as Type 1 material. Additional material at greater depths may be classified as Type 1 as well. Groundwater was not encountered at the site during the investigation. The area is approximately 40 acres . Excavation is likely to occur across the entire acreage, to depths up to 6 feet. The yield of material from this site could be 200,000 cubic yards. The likely haul route from the property would be Clark Road to Live Oak Boulevard, to Pennington Road, accessing the levee at Pennington Road. Alternatively, the haul route could be Township Road to Pennington Road. The post-project land use for the property would be rice production.~~

Lanza 40-Acre Property

~~Similar to the Nevis property, t~~The Lanza ~~40-acre~~ property is 40 acres in size and is currently farmed in ~~rice~~ field/row crops. ~~and~~ It is located at North Township Road and Pease Road south of Live Oak and north of Yuba City. The site has not yet been investigated to determine the types of materials present. Excavation of the site to a depth of 6 feet may occur. The yield of material from this site could be 200,000 cubic yards. The likely haul route would be along Pease Road directly east to the levee. The post-project land use for the property would be rice production.

Marler Property

The Marler Property is a 10-acre property at Johnson Road near Messick Road north of Star Bend and south of Shanghai Bend. The site is currently an orchard. The depth of excavation could be upwards of 6 feet. The yield of material from this site could be 75,000 cubic yards. The likely haul road would be Johnson Road to Messick Road to the Garden Highway, accessing the levee near Oswald Road. The post-project land use for the property would be agricultural production, likely row crops or orchard.

North Valley Property

The North Valley property is owned by North Valley Properties, LLC and is located south of Ella Road between Feather River Boulevard and Arboga Road. The Wheeler Ranch housing development is proposed at the site. Borrow for the FRWLP would be taken from the northeast corner of the property to create a 24.5-acre detention pond (referred to as the Ella Basin). The Ella Basin is being constructed as part of Reclamation District No. 784's Master Drainage Plan. Historically, the site was cultivated for agricultural purposes. Currently, the site is disked ruderal grassland with some roads cut in the southern portion of the property for the Wheeler Ranch development. The material at this site is anticipated to be CL from a depth of 18–22 feet, followed by silt- sand material below a depth of 22–25 feet. The depth of excavation is anticipated to be 15–20 feet and the yield of material from this site could be 400,000–500,000 cubic yards. Borrow material from this site would be used for

work in Reach 13 of Contract C (60–70,000 cubic yards needed), Contract B, and the remainder of Contract C. If borrow material is remaining, it may also be used for Contract D.

The haul route to the northern portion of Contract C from the North Valley Property would be west on Ella Avenue to north on Feather River Boulevard to north on SR 70 to west on SR 20/Colusa Avenue to north on Live Oak Boulevard to north on SR 99 to east on Paseo Avenue. Additional access route to the levee along northbound SR 99 would be north on Kent Avenue to east on Koch Lane. Additional access routes to the levee along northbound Live Oak Boulevard would be east on Morse Road, east on Rednall Road and east on Market Street to east on Lynn Way. Additional access routes to the levee along westerly SR 20/Colusa Avenue would be North on Sutter Street/Market Street to east on Lynn Way.

The haul route to the southern portion of Contract C (and Reach 13) from the North Valley Property would be west on Ella Avenue to north on Feather River Boulevard to north on SR 70 to west on SR 20/Colusa Avenue to south on Sutter Street to south on 2nd Street to levee access. Additional access route to the levee along westerly SR 20/Colusa Avenue would be south on SR 99 to east on Bogue Road to south on Garden Highway to east on Shanghai Bend Road.

The post-Action land use of the site would be a regional detention pond for Reclamation District No. 784.

~~**Schmidl Property**~~

~~The Schmidl property is a 100-acre parcel located at State Highway 20, two-thirds of a mile west of Humphrey Road. It is currently farmed in rice. Preliminary investigations indicate the site is likely to provide Type 1 material to a depth of 3 feet or more. There are some cemented materials at the 2–3-foot depth that will need to be processed during the operation for the borrow operation, or for future farming. As the site would remain in rice following the borrow operation, the site would be land-leveled to a depth of 2–3 feet to ensure future drainage. If upon further investigation it is determined that the site cannot be lowered 2–3 feet and still positively drain to adjacent irrigation ditches, material not meeting levee specifications may be hauled back from the levee and placed at the site to raise the grade. It may not be fully restored to its current elevation, only to the elevation necessary to drain. Hauling from the site to areas south of Yuba City would be from State Highway 20 east to George Washington Road (or SR 99), south to Bogue Road, then east to the Garden Highway, south to Shanghai Bend Road, and east to the Feather River levee. For areas north of Yuba City, hauling would be along State Highway 20 east to SR 99, north to Queens Avenue, east to Live Oak Boulevard, then to the levee by way of the ramp opposite of Northgate Drive.~~

2.3.7 Cutoff Wall Gap Closure and Special Crossings

Three reaches of the Feather River West Levee—Reaches 14, 15, and 16—have had cutoff walls constructed along the approximate levee centerline. However, the projects skipped two major bridge crossings, the 5th Street bridge at Station 1007+00 and State Route (SR) 20 bridge at Station 1025+20, creating gaps in the cutoff wall. In addition, there are two other crossings that require special consideration for the cutoff wall construction: the Union Pacific Railroad (UPRR) crossing at Station 1131+00 and the 10th Street Bridge at Station 1902+00.

The Yuba City Department of Public Works is working to replace the existing 5th Street Bridge with a new bridge located just north of the existing bridge alignment. The new bridge would be in an area where the USACE previously constructed a cutoff wall through the levee. SBFCA intends to wait until

Yuba City completes the new bridge and takes the existing bridge out of service. At that time, the gap in the existing cutoff wall can be closed using conventional cutoff wall construction techniques.

For the 10th Street Bridge, three alternatives were considered. Alternative 1 consisted of a cutoff wall across the roadway constructed by the jet grout method. Alternative 2 consisted of a cutoff wall by the sheet pile method. Alternative 3 consisted of a seepage berm constructed within and adjacent to the abandoned railroad tunnel beneath the roadway on the landside of the levee. The seepage berm was selected as the preferred alternative.

For the UPRR Railroad, two alternatives were considered. Alternative 1 consisted of a cutoff wall constructed by the jet grout method. Alternative 2 consisted of installing sheet piles through the track alignment. Based on discussions with UPRR, the existing tracks are a main route that may not be taken out of service for an extended period. This effectively eliminated installation of sheet piles as an alternative because that approach would require removal of a portion of the tracks . Therefore, Alternative 1, the jet grout cutoff wall, was selected. The wall would be constructed by installing a rectangular jet grout wall panel to the required depth from injection points adjacent to the tracks. The jet grout wall would only extend laterally a short distance beyond the track limits to minimize cost. From the termination points of the jet grout wall, steel sheet piles would be used to connect the ends of the jet grout wall to the endpoints of the conventional soil-bentonite wall, which would be constructed during the 2013/2014 season. The end points of the conventional soil-bentonite wall are established by determining where the open excavation of the soil-bentonite wall trench would no longer be under the load influence of the railroad tracks.

2.4 Environmental Commitments

Environmental commitments are measures incorporated as part of the project description, meaning they are proposed as elements of the proposed project and are to be considered in conducting the environmental analysis and determining effects and findings. The purpose of environmental commitments is to reflect and incorporate best practices into the project that avoid, minimize, or offset potential environmental effects. *Note: The term* mitigation *is specifically applied in this EIS/EIR only to designate measures required to reduce environmental effects triggering a finding of significance.* These best practices tend to be relatively standardized and compulsory; they represent sound and proven methods to reduce the potential effects of a project. By incorporating environmental commitments into the project, the project proponent commits in good faith to undertaking and implementing these measures in advance of effect findings and determinations to improve the quality and integrity of the project, streamline the environmental analysis, and demonstrate responsiveness and sensitivity to protecting the environment. The environmental commitments would be implemented under all project alternatives, with the exception of the No Action Alternative.

To avoid and minimize construction-related effects, SBFCA would implement the following environmental commitments to reduce or offset short-term, construction-related effects. Measures have been developed for each of the topics below, to be applied to the FRWLP project resource analyses.

2.4.1 Protective Barrier Fencing

The construction specifications would require that SBFCA retain a qualified biologist to identify sensitive biological resources (e.g., special-status species, riparian habitat, wetlands, and elderberry shrubs) adjacent to the construction zone that are to be avoided during construction. Fencing would include K-rail concrete barriers, orange construction fencing, and exclusion fencing. Barrier fencing type and placement as it relates to each habitat and species is discussed in the species-specific measures that follow.

Before construction, the contractor would work with the project engineer and a resource specialist to identify the barrier fencing locations and would place stakes around the sensitive biological resources to indicate their locations. The protected area would be clearly identified on the construction drawings. The fencing would be installed at least 20 feet from each sensitive biological resource (where feasible) and would be in place before construction activities are initiated. The fencing would be maintained by SBFCA or its contractor throughout the duration of the construction period. If the fencing is removed, damaged, or otherwise compromised during construction, construction activities would cease until the fencing is replaced.

2.4.2 Avoidance Measures for Valley Elderberry Longhorn Beetle

Elderberry shrub survey results are presented in Section 3.9, *Wildlife*, Table 3.9-1, and the locations of shrubs are shown in Plate 3.9-1.

The following measures would be implemented as part of the FRWLP to avoid and minimize effects on valley elderberry longhorn beetle (VELB).

- Before ground disturbance, all construction personnel would participate in a U.S. Fish and Wildlife Service (USFWS)-approved worker environmental awareness program. A qualified biologist approved by the USFWS would inform all construction personnel about the life history of VELB and the importance of its host shrub, the elderberry. Proof of this instruction would be submitted to the USFWS.
- For shrubs within the vicinity of construction activities, a buffer area would be established by installing concrete barriers and temporary orange construction fencing (4-foot-high commercial- quality woven polypropylene). Within buffer areas, signs would be posted along fencing for the duration of construction. The signs would contain the following information.

  > This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Federal Endangered Species Act of 1973 (ESA), as amended. Violators are subject to prosecution, fines, and imprisonment.

- Buffer area fences around elderberry shrubs/clusters would be inspected weekly by a qualified biologist during ground-disturbing activities and monthly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor and the resident engineer. The biological monitor would be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. The monitor would provide biological inspection reports to SBFCA and USFWS.

- SBFCA would ensure that the project site is be watered down as necessary to prevent dust from becoming airborne and accumulating on elderberry shrubs in and adjacent to construction sites.

2.4.3 Avoidance Measures for Giant Garter Snake

Giant garter snakes have the potential to use aquatic habitat in the project area, including depressional wetland and open water areas. Upland areas adjacent to these aquatic habitats could also be used by giant garter snake~~s~~ for basking, cover, and refuge areas.

SBFCA would implement the following measures to avoid and minimize effects on giant garter snake and ~~their~~ its habitat.

- To reduce the likelihood of snakes entering these areas during construction activities, SBFCA would install exclusion fencing along the depressional wetlands and open water areas to be preserved (areas within 200 feet of suitable habitat). The exclusion fencing would be installed and maintained for the duration of active construction to reduce the potential for direct loss. The fencing would consist of 3- to 4-foot-tall erosion fencing buried at least 6 to 8 inches below ground level. The fencing would ensure that giant garter snakes are excluded from the construction area and that suitable upland and aquatic habitat is protected throughout construction. To ensure that construction equipment and personnel do not affect aquatic habitat for giant garter snake outside the construction corridor, a combination of K-rail fencing and orange barrier fencing would be erected (in addition to the exclusion fencing) to clearly define the aquatic habitat to be avoided.
- A USFWS-approved biologist would conduct a preconstruction survey in suitable habitat no more than 24 hours before construction. Prior to construction each morning, construction personnel would inspect exclusion and orange barrier fencing to ensure they are both in good working order. If any snakes are observed within the construction area during this inspection or at any other time during construction the project biologist would be contacted to survey the site for snakes. The project area would be re-inspected and surveyed whenever a lapse in construction activity of 2 weeks or more occurs. If a snake (believed to be a giant garter snake) is encountered during construction, activities would cease until appropriate corrective measures have been completed or it has been determined that the snake would not be harmed.
- Vegetation clearing within 200 feet of the banks of potential giant garter snake aquatic habitat would be limited to the minimum area necessary. Avoided giant garter snake habitat within or adjacent to the project area would be flagged and designated as an environmentally sensitive area, to be avoided by all construction personnel.
- The movement of heavy equipment within 200 feet of the banks of potential giant garter snake aquatic habitat would be confined to designated haul routes to minimize habitat disturbance.
- Before ground disturbance, all construction personnel would participate in a USFWS-approved worker environmental awareness program. A qualified biologist approved by the USFWS would inform all construction personnel about the life history of giant garter snakes and the importance of both aquatic and upland habitat areas. Proof of this instruction would be submitted to the USFWS.

2.4.4 Avoidance Measures for Swainson's Hawk

Swainson's hawks are known to nest in and adjacent to the project area, and project construction could affect Swainson's hawk, either directly or through habitat modification.

To avoid and minimize effects on Swainson's hawk, SBFCA would implement the following measures.

- Before ground disturbance, all construction personnel would participate in a California Department of Fish and ~~Game~~ Wildlife (CDFW~~DFG~~)-approved worker environmental awareness program. A qualified biologist would inform all construction personnel about the life history of Swainson's hawk and the importance of nest sites and foraging habitat.
- Install construction barrier fencing to delineate the construction area and protect sensitive resources.
- A breeding season (generally February 1–August 31) survey for nesting migratory birds would be conducted for all trees and shrubs located within 500 feet (0.25 mile for Swainson's hawk) of construction activities, including grading. Swainson's hawk surveys would be completed during at least two of the following survey periods: January 1 to March 20, March 20 to April 5, April 5 to April 20, and June 10 to July 30 with no fewer than three surveys completed in at least two survey periods, and with at least one of these surveys occurring immediately prior (within 48 hours) to project initiation (Swainson's Hawk Technical Advisory Committee 2000). The results of the surveys would be submitted to CDFW~~DFG~~. Other migratory bird nest surveys can be conducted concurrent with Swainson's hawk surveys. If the biologist determines that the area surveyed does not contain any active migratory bird nests, construction activities, including vegetation removal or pruning of trees and shrubs, can commence without any further mitigation.
- If active nests are found, SBFCA would maintain a 0.25-mile buffer or other distance determined appropriate through consultation with CDFW~~DFG~~, between construction activities and the active nest(s) until young have been determined to have fledged. In addition, a qualified biologist (experienced with raptor behavior) would be present onsite (daily) during construction activities occurring during the breeding season to watch for any signs of stress. If nesting birds are observed to exhibit agitated behavior indicating that they are experiencing stress, construction activities would cease until a qualified biologist, in consultation with ~~DFG~~CDFW, determines that young have fledged the active nest.

To avoid removing or disturbing any active Swainson's hawk nests, other special-status bird nests, or non-special-status migratory bird nests, tree and shrub removal would be conducted during the non-breeding season (generally September 1 through January 31) or after a qualified biologist determines that fledglings have left an active nest.

2.4.5 Avoidance Measures for Raptors

For construction between March 1 and August 1, SBFCA would perform preconstruction surveys to determine whether raptors are nesting or roosting at or adjacent to staging or construction areas. In the event nesting or roosting raptors are identified, SBFCA would coordinate with ~~DFG~~CDFW to identify measures to ensure raptors are not adversely affected. These measures may include implementation of suitable buffers and phasing of construction.

2.4.6 Measures for Protected and Riparian Trees

SBFCA would comply with existing tree ordinance requirements and would implement the following measures.

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

Prepare tree and riparian habitat mitigation and monitoring plans. Potential mitigation areas would be evaluated by a qualified restoration ecologist, biologist, or certified arborist to determine their suitability to support the target native tree species.

2.4.7 Invasive Plant Species Prevention Measures

The project proponent would implement one or more of the following actions to avoid and minimize the spread or introduction of invasive plant species. In addition, the project proponent would coordinate with the Agricultural Commissioners for Sutter and Butte Counties to ensure that the appropriate best management practices (BMPs) are implemented for the duration of the construction projects.

- Clean construction equipment and vehicles in a designated wash area prior to entering and exiting the project site.
- Educate construction supervisors and managers about invasive plant identification and the importance of controlling and preventing the spread of invasive plant infestations.
- Treat small, isolated infestations with eradication methods that have been approved by or developed in conjunction with the Sutter and Butte County Agricultural Commissioners to prevent and/or destroy viable plant parts or seeds.
- Minimize surface disturbance to the greatest extent feasible to complete the work.
- Use native, non-invasive species or non-persistent hybrids in erosion-control plantings to stabilize site conditions and prevent invasive plant species from colonizing.
- Use weed-free imported erosion-control materials (or rice straw) in upland areas.
- One year after construction, conduct a monitoring visit to ensure that no new occurrences have established.

2.4.8 Construction Limitations near Residences

Construction activities scheduled to occur between 7 a.m. and 7 p.m. would not take place before or past daylight hours (which varies according to season) within 0.25 mile of sensitive residential receptors. This would eliminate the need to introduce high-wattage lighting to operate in the dark.

2.4.9 Revegetation of Disturbed Areas~~Use of Native Wildflower Species in Erosion Control Grassland Seed Mix~~

2.4.9.1 Native Wildflower Species in Erosion Control Grassland Seed Mix

SBFCA would require construction contractors to use wildflower seed in erosion control measures. Only native wildflower species would be incorporated into the seed mix and applied to all exposed slopes. Wildflowers would provide seasonal variation. Species selected would be native and indigenous to the area and appropriate for the surrounding habitat. If not appropriate for the surrounding habitat, wildflowers should not be included in the seed mix. Under no circumstances would invasive plant species be used in any erosion control measures.

2.4.9.2 Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones

In addition, replacement plantings will be installed in areas where vegetation was removed to accommodate utility line relocation and will conform to safety requirements for utility line vegetation clearance zones. Revegetation will be accomplished by using the same plant species that were removed, in order to restore pre-construction site vegetation. However, in locations where the existing vegetation that was removed is invasive, replacement plantings will be accomplished with species that are native and indigenous to the area. Native plant species will be chosen for their appropriateness to site-specific conditions and the surrounding habitat. No invasive plant species will be used under any conditions.

2.4.10 Soil Borrow Site Reclamation Plan

This project would develop measures to remediate exposed soil and terrain to make it suitable for agriculture, planned development, or reuse as a natural habitat and to mitigate visual effects where the borrow sites are not intended for detention basins. The reclamation plan could return the land to agricultural uses, development, recreational uses, or mixed uses. All restoration plantings would be native and indigenous to the area, and no invasive plant species would be used under any conditions. In areas to be used for agriculture, the reclamation grading plan would mimic the preexisting landform pattern to the highest degree possible, given geotechnical constraints.

All terrain would be designed and graded to be rounded, avoiding sharp angles and steep or abrupt grade breaks. Special attention would be paid to the transition from undisturbed to disturbed terrain to ensure that the transition appears as natural as possible, and to blend the lines between the two for a natural, organic appearance. In addition, before any vegetation removal the site would be surveyed visually for the presence of rock outcroppings, downed trees, or similar features. Where appropriate, features such as downed trees salvaged during site preparation and excavation activities would be replaced.

2.4.11 Postconstruction Operations and Maintenance

After construction completion, the levee and staging areas and levee slopes would be hydroseeded for erosion protection, dust abatement, and to prevent colonization of exotic vegetation.

The FRWLP is part of the SRFCP as described in Section 1.3.1, *Flood Management History*, and its O&M is covered in the manual and four supplements for the SRFCP (also as described in that section).

To meet Federal Flood Control Regulations (33 CFR 208.10) and state requirements (California Water Code Section 8370), the Federal ~~flood control~~flood risk management facilities are inspected four times annually, at intervals not exceeding 90 days. DWR would inspect the system twice a year, and the local maintaining authorities would inspect it twice a year and immediately following major high water events. The findings of these inspections would be reported to the CVFPB's Chief Engineer through DWR's Flood Project Integrity and Inspection Branch (FPIIB).

Typical maintenance activities would include vegetation control through mowing, herbicide application, and/or slope dragging; rodent control; patrol road maintenance; and erosion control and repair. Vegetation control typically would be performed twice a year. Herbicide and bait station application would be conducted under county permit by experts licensed by the state for pest control. Erosion control and slope repair activities would include re-sloping and compacting; fill and repair of damage from rodent burrows would be treated similarly. These activities are performed for approximately 20 days annually. Patrol road reconditioning activities would typically be performed once a year and would include placing, spreading, grading, and compacting aggregate base or substrate.

2.4.12 Stormwater Pollution Prevention Plan

Because ground disturbance for the project would be greater than 1 acre, SBFCA would obtain coverage under the U.S. Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) general construction activity stormwater permit. The Central Valley Regional Water Quality Control Board (RWQCB) administers the NPDES storm water permit program in Sutter and Butte counties. Obtaining coverage under the NPDES general construction activity permit generally requires that the project applicant prepare a stormwater pollution prevention plan (SWPPP) that describes the BMPs that would be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction. The SWPPP would be prepared prior to commencing earth-moving construction activities.

The specific BMPs that would be incorporated into the erosion and sediment control plan and SWPPP would be site-specific and would be prepared by the construction contractor in accordance with the California RWQCB Field Manual. However, the plan likely would include one or more of the following standard erosion and sediment control BMPs.

- **Timing of construction**. The construction contractor would conduct all construction activities during the typical construction season to avoid ground disturbance during the rainy season.
- **Staging of construction equipment and materials**. To the extent possible, equipment and materials would be staged in areas that have already been disturbed.
- **Minimize soil and vegetation disturbance**. The construction contractor would minimize ground disturbance and the disturbance/destruction of existing vegetation. This would be

accomplished in part through the establishment of designated equipment staging areas, ingress and egress corridors, and equipment exclusion zones prior to the commencement of any grading operations.

- **Stabilize grading spoils**. Grading spoils generated during construction would be temporarily stockpiled in staging areas. Silt fences, fiber rolls, or similar devices would be installed around the base of the temporary stockpiles to intercept runoff and sediment during storm events. If necessary, temporary stockpiles may be covered with an appropriate geotextile to increase protection from wind and water erosion.
- **Install sediment barriers**. The construction contractor may install silt fences, fiber rolls, or similar devices to prevent sediment-laden runoff from leaving the construction area.
- **Stormwater drain inlet protection**. The construction contractor may install silt fences, drop inlet sediment traps, sandbag barriers, and/or other similar devices.
- **Permanent site stabilization**. The construction contractor would install structural and vegetative methods to permanently stabilize all graded or otherwise disturbed areas once construction is complete. Structural methods may include the installation of biodegradable fiber rolls and erosion control blankets. Vegetative methods may involve the application of organic mulch and tackifier and/or the application of an erosion control seed mix. Implementation of a SWPPP would substantially minimize the potential for project-related erosion and associated adverse effects on water quality.
- **Offsite Tracking.** Install rumble plates and crushed rock at project site entrance and exit locations to control offsite tracking of mud from construction vehicles.

2.4.13 Bentonite Slurry Spill Contingency Plan (Frac-Out Plan)

Before excavation begins, SBFCA would ensure the contractor would prepare and implement a bentonite slurry spill contingency plan (BSSCP) for any excavation activities that use pressurized fluids (other than water). If the contactor prepares the plan, it would be subject to approval by USACE, USFWS, National Marine Fisheries Service (NMFS), CDFW, RWQCB and SBFCA before excavation can begin. The BSSCP would include measures intended to minimize the potential for a frac-out (short for "fracture-out event") associated with excavation and tunneling activities; provide for the timely detection of frac-outs; and ensure an organized, timely, and *minimum-effect* response in the event of a frac-out and release of excavation fluid (i.e., bentonite). The BSSCP would require, at a minimum, the following measures.

- If a frac-out is identified, all work would stop, including the recycling of the bentonite fluid. In the event of a frac-out into water, the location and extent of the frac-out would be determined, and the frac-out would be monitored for 4 hours to determine whether the fluid congeals (bentonite usually hardens, effectively sealing the frac-out location).
- USACE, USFWS, NMFS, ~~DFG~~CDFW, and the RWQCB would be notified immediately of any spills and would be consulted regarding cleanup procedures. A Brady barrel would be onsite and used if a frac-out occurs. Containment materials, such as straw bales, also would be onsite prior to and during all operations and a vacuum truck would be on retainer and available to be operational onsite within notice of 2 hours. The site supervisor would take any necessary follow-up response actions in coordination with agency representatives. The site supervisor

would coordinate the mobilization of equipment stored at staging areas (e.g., vacuum trucks) as needed.

- If the frac-out has reached the surface, any material contaminated with bentonite would be removed by hand to a depth of 1-foot, contained, and properly disposed of, as required by law. The drilling contractor would be responsible for ensuring that the bentonite is either properly disposed of at an approved Class II disposal facility or properly recycled in an approved manner.
- If the bentonite fluid congeals, no other actions, such as disturbance of the streambed, would be taken that would potentially suspend sediments in the water column.
- The site supervisor has overall responsibility for implementing this BSSCP. The site supervisor would be notified immediately when a frac-out is detected. The site supervisor would be responsible for ensuring that the biological monitor is aware of the frac-out and for coordinating personnel, response, cleanup, regulatory agency notification, and coordination to ensure proper cleanup, disposal of recovered material, and timely reporting of the incident. The site supervisor would ensure all waste materials are properly containerized, labeled, and removed from the site to an approved Class II disposal facility by personnel experienced in the removal, transport, and disposal of drilling mud.
- The site supervisor would be familiar with the contents of the BSSCP and the conditions of approval under which the activity is permitted to take place. The site supervisor would have the authority to stop work and commit the resources (personnel and equipment) necessary to implement the BSSCP. The site supervisor would ensure that a copy of the BSSCP is available (onsite) and accessible to all construction personnel. The site supervisor would ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of excavation operations.

2.4.14 Spill Prevention, Control, and Counter-Measure Plan

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

SBFCA would review and approve the SPCCP before onset of construction activities and routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. SBFCA would notify its contractors immediately if there is a non-compliance issue and would require compliance.

The Federal reportable spill quantity for petroleum products, as defined in 40 CFR 110, is any oil spill that results in the following.

- Violates applicable water quality standards.
- Causes a film or sheen on or discoloration of the water surface or adjoining shoreline.
- Causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

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

2.4.15 Monitoring of Turbidity in Adjacent Water Bodies

SBFCA or its contractor would monitor turbidity in the adjacent water bodies, where applicable criteria apply, to determine whether turbidity is being affected by construction and ensure that construction does not affect turbidity levels, which ultimately increase the sedimentation loads.

The Basin Plan contains turbidity objectives for the Sacramento River and its tributaries, including the Feather River. Specifically, the plan states that where natural turbidity is between 5 and 50 ~~Nephelometric~~ nephelometric turbidity units (NTUs), turbidity levels may not be elevated by 20% above ambient conditions. Where ambient conditions are between 50 and 100 NTUs, conditions may not be increased by more than 10 NTUs.

SBFCA or its contractor would monitor ambient turbidity conditions upstream during construction. Monitoring would continue approximately 200 feet downstream of construction activities to determine whether turbidity is being affected by construction. Grab samples would be collected at a downstream location that is representative of the flow near the construction site. If there is a visible sediment plume created as a result of construction, the sample would be expected to represent this plume. Monitoring would occur once a week on a random basis as long as construction does not encroach into the Feather River. If construction does encroach into the Feather River, monitoring frequency would increase to hourly.

If turbidity limits exceed Basin Plan standards, construction-related earth-disturbing activities would slow to a point that results in alleviating the problem. SBFCA would notify the Central Valley RWQCB of the issue and provide an explanation of the cause.

2.4.16 Mitigation and Monitoring Plan

A mitigation and monitoring plan (MMP) has been developed for effects associated with implementation of the FRWLP (see Appendix F). Project implementation will create permanent and unavoidable impacts on habitats and species that require mitigation. This document identifies responsible parties for the mitigation project, describes the location and nature of the project, and discusses the types, functions, and values of USACE jurisdictional wetlands and other waters of the United States.

In addition to the mitigation plan for impacted Section 404 jurisdictional features, the MMP also includes impacts and mitigation for riparian and non-riparian native trees, and special status species VELB and giant garter snake, for which compensatory mitigation is required.

2.5 Detailed Measure Descriptions

2.5.1 Slurry Cutoff Wall

2.5.1.1 Objective

A slurry cutoff wall consists of impermeable material that is placed parallel to the levee, typically through the center of the levee crown (Plate 2-4). There are three methods for constructing a slurry cutoff wall: (1) conventional slot trench, (2) deep soil mixing (DSM), and (3) jet grouting. The first two methods are for application over longer areas while jet grouting is a spot application based on limiting conditions for the primary methods. A slurry cutoff wall addresses the deficiency of seepage (through- and under-seepage).

Please see Table 2-45 for proposed location of slurry walls in the project design.

2.5.1.2 Design and Construction

Conventional Slot Trench Method

To begin construction, the construction site and any necessary construction staging or slurry mixing areas are cleared, grubbed, and stripped.

In the conventional slot trench method, a trench is excavated at the top center of the levee and into subsurface materials. The size of the trench is based on the severity of the seepage but can be typically 3 feet wide and up to 80–90 feet deep. As the trench is excavated, it is filled temporarily with bentonite water slurry to prevent cave in. The soil from the excavated trench then is hauled to a nearby location where it is mixed with hydrated bentonite to reduce permeability and cement in some applications where increased strength is desired. The soil-bentonite mixture then is returned to the levee and backfilled into the trench. This mixture hardens and creates the impermeable barrier wall in the levee.

In most cases, degradation of the levee crown is necessary to create a large enough working platform and reduce the risk of hydraulic fracturing from the insertion of slurry fluids, also allowing greater depths to be reached. Dependent on the conditions of the particular levee, it may be necessary to degrade the levee by one- to two-thirds its existing height. The excavated material is hauled to a nearby stockpile area. Following completion of the slurry cutoff wall, the material is hauled back to the levee to restore the levee to its original dimensions. The material may need to be hauled offsite and borrow material may need to be imported if the in-situ levee material is found to be unsuitable for current levee standards.

One construction crew typically is able to construct 75 to 100 linear feet of slurry wall (approximately 70 to 80 feet deep) in an 8-hour shift. Equipment needed for the crew includes a long-reach track hoe, three or four dump trucks (15-cubic- yard capacity each), two loaders at the mixing location, bulldozers, excavators, loaders, a rough terrain forklift, compactors, maintainers,

and a water truck. Vertical clearance of about 40 feet is needed for the excavator boom. Horizontal clearance of about 30 feet beyond the levee crest may be required for excavator swing when loading dump trucks.

A mixing area is located at the construction staging area. The mixing area is to prepare the soil-bentonite mixture and supply bentonite-water slurry. The mixing area is contained to avoid inadvertent dispersal of the mixing materials. Dump trucks haul material between the excavator and the mixing area along the levee.

An access road made of aggregate base rock is constructed on the levee crown to enable regular levee inspections.

A listing of the construction equipment and materials necessary to construct a slurry cutoff wall by this method are listed in Table 2-6. Post-construction, areas used for construction staging, mixing, the levee crown, slopes, and any other disturbed areas are hydroseeded.

Table 2-6. Conventional Slot Trench Slurry Wall—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Work platform and trench excavation	Excavator or track hoe	Bentonite
Mixing/placement of soil bentonite mix	Long reach track hoe	Bentonite
Replacement of levee material	Bulldozer	Embankment fill material
	Haul truck	Water
Finish grading	Bulldozer	Aggregate base rock
Site restoration and demobilization	Haul truck	Hydroseed
	Front end loader	
	Compactor	Miscellaneous construction support materials
	Maintainer	Embankment fill material (if existing material is of poor quality)
	Water truck	Water
	Rough terrain forklift	

Deep Soil Mixing Method

The DSM method of constructing a slurry cutoff wall uses a crane-supported set of two to four mixing augers (typically 36 inches in diameter) set side by side. These augers are drilled through the levee crown and foundation to the required depth (capable of a maximum depth of about 200 feet). As the augers are inserted and withdrawn, a soil-bentonite grout is injected through the augers and mixed with the native soil. An overlapping series of mixed columns is drilled to create a continuous seepage cutoff barrier (Plate 2-5).

To provide a wide enough working platform on the levee crown, the upper portion of some segments of the levee requires excavation with a paddle wheel scraper. Material is scraped and stockpiled at a nearby stockpile area. Dependent on the depth of the wall required, vertical clearance for the crane also may be needed. An excavator manipulates injector return spoils near the DSM rig, and transport trucks are used to haul spoils off site. A crane is used for in-place sampling of

DSM material and also for loading bentonite into the batch plant hopper. A mobile batch plant (diesel-powered) is required near each DSM rig at the work area to prepare the cement-bentonite grout. The grout is transported to the DSM rig through flexible hoses. Each batch plant requires a pad of 50 by 100 feet. Hauling at the work area involves scraper runs along the levee to the staging area and cement and bentonite deliveries to the batch plant.

During DSM slurry wall construction, one DSM rig typically can construct 50 linear feet of DSM wall per 8-hour shift (for wall depths up to 135 feet).

The equipment and materials necessary to construct a DSM slurry wall are listed in Table 2-7. Post-construction, areas used for construction staging, the levee slopes, and any other disturbed areas are hydroseeded.

Table 2-7. Deep Soil Mixing Slurry Wall—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Work platform excavation	Excavator or track hoe	
Deep soil mixing (DSM)	DSM crane	Bentonite
	Mobile batch plant	
	Piping from drill rig to batch plant	
Replacement of levee material	Bulldozer	Water
	Haul truck	Embankment fill material
Finish grading	Bulldozer	Aggregate base rock
Site restoration and demobilization	Haul truck	Hydroseed
	Front end loader	Miscellaneous construction support materials
	Paddle wheel scraper	Embankment fill material (if existing material is of poor quality)
	Water truck	Water

Jet Grouting Method

Jet grouting involves injecting fluids or binders into the soil at very high pressure. The injected fluid can be grout; grout and air; or grout, air, and water. Jet grouting breaks up soil and, with the aid of a binder, forms a homogenous mass that solidifies over time to create a mass of low permeability (Plate 2-6). Jet grouting typically is used in constructing a slurry cutoff wall (described later in this chapter) to access areas other methods cannot. In this regard, it is typically a spot application rather than a treatment to be applied on a large scale along an entire reach. Jet grouting addresses the deficiency of seepage (through- or under-seepage).

Equipment required for jet grouting consists of a drill rig fitted with a special drill string; a high pressure, high flow pump; and an efficient batching plant with sufficient capacity for the required amount of grout and water. The high-pressure pump conveys the grout, air, and/or water through the drill string to a set of nozzles located just above the drill bit. The diameter of the jet grout column is dependent on site specific variables such as soil conditions, grout mix, nozzle diameter, rotation speed, withdrawal rate, and grout pressure. Jet grouted columns range from 1 to 16 feet in diameter

and are typically interconnected to form cutoff barriers or structural sections. One construction crew, consisting of a site supervisor, pump operator, batch plant operator, chuck tender, and driller under ideal conditions, can construct two 6-foot diameter, 50 foot columns per day consisting of approximately 100 cubic yards of grout injected per 8 hour shift. Ideal conditions would be characterized by no technical issues occurring at either the batch plant or the drilling site, such as loss of fluid pressure, breakdown of equipment, or subsurface obstructions to drilling operations.

To initiate jet grouting, a borehole is drilled through the levee crown and foundation to the required depth (to a maximum depth of approximately 130 feet) by rotary or rotary-percussive methods using water, compressed air, bentonite, or a binder as the flushing medium. When the required depth is reached, the grout is injected at a very high pressure as the drill string is rotated and slowly withdrawn. Rotation speeds range between 10 and 30 rpm and the withdrawal rates vary between 2 and 12 inches per minute. Use of the double, triple, and superjet systems create eroded spoil materials that are expelled out of the top of the borehole. The spoil material contains significant grout content and is frequently used as a construction fill.

To provide a wide enough working platform on the levee crown, the upper portion of some segments of the levee may require degradation with a paddle wheel scrapper. Material is scraped and stockpiled at a nearby stockpile area. Hauling at the work area involves scraper runs along the levee to the staging area and grout, bentonite, and water deliveries to the batch plant.

Batch plants are typically centrally located to the injection site, with pipelines for mixed grout that run the length of the work. Grout mixing and injection equipment consists of grout mixers, high powered grout pumps and supporting generators and air compressors, holding tanks, water tanks, with bulk silos of grout typically used to feed large mixers. Smaller equipment can be used in combination with the single phase-fluid system and can be permanently trailer mounted to permit efficient mobilization and easy movement at the job site.

Prior to commencing production jet grouting, a field test program is typically completed to evaluate injection parameters and to assess jet grout column geometries, and mechanical and permeability properties. Where possible, jet grout test elements are exposed by excavation and properties are obtained by direct measurement. Bulk samples are collected and delivered to a laboratory for unconfined compressive strength and permeability testing, as required. Where excavation is not possible, core drilling is employed to obtain samples from the jet grout test columns for strength testing.

Types of Jet Grouting Systems

A single phase jet grouting system uses the binder to break up and provide soil mixing of the soils surrounding the drill rods. The single jet grouting system is the most versatile; it can be applied at any inclination and in areas where space is restricted. Set up and excavation times are considerably shorter; the method is also less expensive, cleaner, and less noisy than the three-fluid jet grouting system.

A double phase jet grouting system improves the range of influence of the single phase jet grouting system using an aureole of compressed air concentric about the jet of binder. The diameter of a column of soil treated by the single phase jet grouting system can be increased by adding the air component. Additional equipment includes a two-way coaxial drill string and an air compressor.

The triple phase or Kajima jet grouting system uses water and air to break up the soil to produce partial substitution of the finer soil particles to create a column of stabilized material whose

diameter may exceed 6 feet. Additional equipment includes a three-way coaxial drill string, an air compressor, and an additional pump and lines for the water phase.

The superjet grouting system is a modified double phase jet grouting system that uses tooling design efficiencies and increased energy that allows for the construction of large columns, up to 16 feet in diameter. The superjet system operates by mechanically and hydraulically focusing the injection of the grout for pinpoint cutting and erosion of very large volumes of soil in situ. The excess soil-grout mixture is simultaneously expelled at the surface, preventing subsurface pressurization and hydrofracturing. A listing of equipment and materials necessary to construct the jet grouting system is provided in Table 2-8. Areas used for construction staging, the levee slope, and any other disturbed areas are restored and hydroseeded following construction.

Table 2-8. Jet Grouting Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Work platform excavation	Excavator or track hoe	
Jet grouting	Jet grouting drill rig	
	Mobile batch plant	Cement, bentonite
	High pressure, high flow pump	Water
	Piping from drill rig to batch plant (spoil line)	
	Piping from batch plant to drill rig	
Replacement of levee material	Bulldozer	Water
	Haul truck	Embankment fill material
Finish grading	Bulldozer	
Site restoration and demobilization	Haul truck	Miscellaneous construction support materials
	Front end loader	Embankment fill material
	Paddle wheel scraper	Water
	Water truck	

2.5.1.3 Operations and Maintenance

Post-construction, the only permanent facility is the levee with the embedded slurry cutoff wall. O&M would be as described in Section 2.4.11

2.5.2 Slope Flattening

2.5.2.1 Objective

Slope flattening is a mechanical method to repair or reshape slopes that do not meet standards for geometry and stability (Plate 2-7). Levee slopes are typically subject to a standard of 3H:1V, but this may vary based on site-specific conditions and supporting engineering analysis. Slope flattening addresses the deficiency of slope stability and geometry.

Please see Table 2-4 for proposed location of slope flattening in the project design.

2.5.2.2 Design and Construction

To begin slope flattening activities, the area is cleared, grubbed, and stripped to provide space for construction and reshaping of slopes. Additional embankment fill material may be necessary to achieve slope flattening. If so, bulldozers excavate and stockpile borrow material from a nearby permitted borrow site. Front-end loaders load haul trucks with the borrow material. The haul trucks transport the material to slope flattening site. Motor graders spread material evenly according to levee design plans, and sheepsfoot rollers compact the material. Water trucks distribute water over the material to ensure proper moisture for compaction.

To reshape a waterside slope, the existing crown of the levee is shifted farther landward and the waterside slope is trimmed and reshaped to a 3:1 slope. The shifted levee crown would be a minimum of 20 feet wide, with a 3:1 slope on the landward side. An access road made of aggregate base rock is constructed on the levee crown.

Equipment and materials necessary to implement slope flattening treatment are listed in Table 2-9. Post-construction, the construction staging areas, levee slopes, and any other disturbed areas would be hydroseeded.

Table 2-9. Slope Flattening—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	Embankment fill material
Reshaping of slopes and placement of additional fill (if necessary)	Haul truck	Water
	Excavator or track hoe	Embankment fill material
Finish grading	Bulldozer	Aggregate base rock
Site restoration and demobilization	Front end loader	Hydroseed
	Haul truck	Water
	Motor grader	
	Sheepsfoot roller	
	Water truck	

2.5.2.3 Operations and Maintenance

Post-construction, the only permanent facility is the improved levee. O&M would be as described in Section 2.4.11.

2.5.3 Stability Berm

2.5.3.1 Objective

A stability berm would be constructed against the landside slope of the existing levee with the purpose of supplying support as a buttress (Plate 2-8). The height of the stability berm is generally two-thirds the height of the levee; the structural needs of the levee determine the distance it extends along that reach. A stability berm addresses the deficiency of stability.

Please see Table 2-4 for proposed location of stability berms in the project design.

2.5.3.2 Design and Construction

To begin the construction of a stability berm, the site is cleared, grubbed, and stripped to provide space for construction and shaping of the berm. Embankment fill material necessary to construct the berm is excavated by a bulldozer from a nearby borrow site. Front-end loaders load haul trucks with the borrow material and the haul trucks transport the material to the stability berm site. Motor graders spread the material evenly according to design specifications, and a sheepsfoot roller compacts the material. Water trucks distribute water over the material to ensure proper moisture for compaction.

Stability berms may be drained or undrained. An undrained berm consists of embankment fill only. A drained berm includes a layer of drain rock placed along the ground surface underneath the fill material, separated by a casing of filter fabric. Drainage water seeping from the berm would sheetflow on the adjacent landside surface.

Equipment and materials necessary to construct a stability berm are listed in Table 2-10.

Table 2-10. Stability Berm—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Construction and shaping of stability berm	Excavator or track hoe	Embankment fill material
Finish grading	Bulldozer	Water
Site restoration and demobilization	Front end loader	Hydroseed
	Haul truck	Water
	Motor grader	
	Sheepsfoot roller	
	Water truck	

2.5.3.3 Operations and Maintenance

The only post-construction permanent facility is the berm. O&M would be as described in Section 2.4.11

2.5.4 Levee Reconstruction

2.5.4.1 Objective

Levee reconstruction would be necessary where a levee has been degraded to facilitate implementation of another measure (such as a slurry cutoff wall), where a substantial encroachment has been removed from within the levee prism, or otherwise where the levee is found to be deficient and needs to be replaced with materials and methods that meet current engineering standards.

Please see Table 2-4 for proposed levee relocations in the project design.

2.5.4.2 Design and Construction

The existing levee is first cleared, grubbed, and stripped to the desired surface to allow a working platform for other measures (such as a slurry cutoff wall), to remove an encroachment, or to remove substandard material. Embankment fill material necessary to construct the new levee is excavated by a bulldozer from a nearby borrow site. Front-end loaders load haul trucks with the borrow material and the haul trucks transport the material to the stability berm site. Motor graders spread the material evenly according to design specifications, and a sheepsfoot roller compacts the material. Water trucks distribute water over the material to ensure proper moisture for compaction. The new levee would be built in cross section to meet current engineering standards.

Equipment and materials necessary for levee reconstruction are listed in Table 2-11.

Table 2-11. Levee Reconstruction—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
	Bulldozer	
Construction and shaping of levee	Haul truck	Embankment fill material
	Excavator or track hoe	
	Bulldozer	
Finish grading	Bulldozer	Water
	Water truck	Aggregate base rock
Site restoration and demobilization	Front end loader	Hydroseed
	Haul truck	Water
	Motor grader	
	Sheepsfoot roller	
	Water truck	

2.5.4.3 Operations and Maintenance

The only post-construction permanent facility is the reconstructed levee. O&M would be as described in Section 2.4.11

2.5.5 Sheet Pile Wall

2.5.5.1 Objective

A sheet pile wall is a series of vertical panels of interlocking steel that is placed parallel to the levee, typically through the center of the levee crown to provide an impermeable barrier (Plate 2-9). A sheet pile wall addresses the deficiencies of seepage and would be used only as a site-specific treatment (rather than applied on a reach-wide basis) such as at roadway or railroad crossings.

Please see Table 2-4 for proposed location of sheet pile walls in the project design.

2.5.5.2 Design and Construction

The site where sheet piles are to be installed is cleared, grubbed, and stripped to allow for construction activities, including removal of the roadway or railroad. A hydraulic- or pneumatically operated pile-driving head attached to a crane drives the sheet pile into the levee crown to the desired depth (up to 135 feet). If the levee material is particularly solid, pre-drilling may be necessary. The conditions of the site and the desired life of the project determine the thickness and configuration of the sheet piles.

Equipment and materials necessary to construct sheet pile walls are listed in Table 2-12. Post-construction, construction staging areas, the levee crown, slopes, and any other disturbed areas are hydroseeded and the roadway or railroad would be replaced in-kind to the pre-project condition.

Table 2-12. Sheet Pile Wall—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Pile driving of sheet piles	Crane	Steel sheet piles
Finish grading	Bulldozer	Aggregate base rock
Site restoration and demobilization	Front end loader	Hydroseed
	Haul truck	Water
	Crane	
	Water truck	

2.5.5.3 Operations and Maintenance

The only post-construction permanent facility is the sheet pile wall. O&M would be as described in Section 2.4.11.

2.5.6 Seepage Berm

2.5.6.1 Objective

Seepage berms are wide embankment structures made up of low-permeability materials that resist accumulated water pressure and safely release seeping water (Plate 2-10). A seepage berm is typically one-third the height of the levee, extending outward from the landside levee toe approximately 300 to 400 feet, and laterally along the levee as needed relative to the seepage conditions. A seepage berm addresses the deficiency of under-seepage.

Please see Table 2-4 for proposed location of seepage berms in the project design.

2.5.6.2 Design and Construction

A seepage berm can vary in width, from a minimum of four times the levee height to a maximum of 300 feet. Berm heights can also vary but are typically a minimum of 5 feet tall at the landside toe of the levee and generally taper down to 3 feet at the end of the berm.

Construction consists of clearing, grubbing, and stripping the ground surface. Bulldozers then excavate and stockpile borrow material from a nearby borrow site. Front-end loaders load haul

trucks, and the haul trucks subsequently transport the borrow material to the berm site. The haul trucks dump the material and motor graders spread it evenly, placing approximately 3 to 5 feet of embankment fill material. Sheepsfoot rollers compact the material, and water trucks distribute water over the material to ensure proper moisture for compaction.

Seepage berms may have an optional feature of a drainage relief trench under the toe of the berm. Drained seepage berms include the installation of a drainage layer (gravel or clean sand) beneath the seepage berm backfill and above the native material at the levee landside toe. A drained seepage berm does not increase the overall footprint of the berm.

Equipment and materials necessary to construct drained and undrained seepage berms are listed in Table 2-13.

Table 2-13. Seepage Berm—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Embankment fill material placement (if drained berm, drain rock is also placed)	Haul truck	Water
	Excavator or track hoe	Embankment fill material
	Bulldozer	Drain rock (if drained berm)
	Water truck	
Finish grading	Bulldozer	Aggregate base rock
Site restoration and demobilization	Haul truck	Hydroseed
	Motor grader	Water
	Sheepsfoot roller	
	Water truck	

Post-construction, areas used for construction staging, the levee, the berm, and any other disturbed areas are hydroseeded.

2.5.6.3 Operations and Maintenance

The only post-construction permanent facility is the berm. O&M would be as described in Section 2.4.11.

2.5.7 Relief Wells

2.5.7.1 Objective

Relief wells are passive systems that are constructed near the levee landside toe to provide a low-resistance pathway for under-seepage to exit to the ground surface in a controlled and observable manner (Plate 2-11). A low-resistance pathway allows under-seepage to exit without creating sand boils or piping levee foundation materials. Relief wells are an option only in reaches where geotechnical analyses have identified continuous sand and gravel layers. Relief wells are used to address the levee deficiency of under-seepage.

Please see Table 2-4 for proposed location of relief wells in the project design.

2.5.7.2 Design and Construction

Relief wells are constructed using soil-boring equipment to drill a hole vertically through the fine-grained blanket layer (sand) into the coarse-grained aquifer layer (gravel) beneath. Pipe casings and gravel/sand filters are installed to allow water to flow freely to the ground surface, relieving the pressure beneath the clay blanket without transporting fine materials to the surface, which can undermine the levee foundation. Relief wells would be designed to discharge onto a cobble splash and the water would then sheet flow into adjacent agricultural fields. In areas where sheet flow is not feasible, a swale would be excavated and connected to a drainage canal.

Relief wells generally are spaced at 50- to 100-foot intervals, dependent upon the amount of under-seepage, and extend to depths of up to 150 feet. Areas for relief well construction are cleared, grubbed, and stripped. During relief well construction, a typical well-drilling rig is used to drill to the required depth and construct the well (including well casing, gravel pack material, and well seal) beneath the ground surface. The drill rig likely would be an all-terrain, track-mounted rig that could access the well locations from the levee toe.

Areas along the levee toe may be used to store equipment and supplies during construction of each well. Construction of each well and the lateral drainage system typically takes 10 to 20 days. Additional time may be required for site restoration.

Equipment and materials necessary to construct a relief well are listed in Table 2-14.

Table 2-14. Relief Wells—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	Well casing
Drilling and well installation	Drill rig	Well casing
Finish grading	Bulldozer	
Site restoration and demobilization	Equipment support vehicle	Drain pipe
	Haul truck	Hydroseed
	Motor grader	Concrete
	Sheepsfoot roller	Water
	Water truck	
	Small compactor	

Post-construction, areas used for construction staging, the levee slopes, and any other disturbed areas are hydroseeded.

2.5.7.3 Operations and Maintenance

Relief wells require regular maintenance to ensure proper operation. Piezometers, also called monitoring wells, could be installed between relief wells to allow monitoring of groundwater levels to ensure the wells are relieving the pressure within the aquifer.

Permanent facilities associated with relief wells include the wells themselves and surface drainage trenches to control the discharge. Inspection of the relief wells is required at least annually, and observation of flow from the wells is required during high river stages. The wells are test-pumped periodically. The collection ditch is maintained to allow free flow of water.

2.5.8 Depression/Ditch Infilling

2.5.8.1 Objective

Depressions and ditches can contribute to risk of levee failure if a seepage pathway forms under the levee and the water then surfaces through the depression or ditch, exploiting its less resistive nature compared to surrounding soil mass. This measure involves placing fill soil in such depressions and ditches to remove localized susceptibility to seepage.

Please see Table 2-4 for proposed location of depression/ditch infilling in the project design.

2.5.8.2 Design and Construction

Construction consists of clearing, grubbing, and stripping the ditch or depression surface to remove vegetative material. Bulldozers then excavate and stockpile borrow material from a nearby borrow site. Front-end loaders load haul trucks, and the haul trucks subsequently transport the borrow material to the fill site. The depression or ditch may be further excavated to provide a surface that the fill soil may be keyed into. The haul trucks dump the material and motor graders or bulldozers smooth the material level with the surrounding land surface. An excavator may also be used for placement. Sheepsfoot rollers compact the material, and water trucks distribute water over the material to ensure proper moisture for compaction.

Equipment and materials necessary to fill depressions and ditches are listed in Table 2-15.

Table 2-15. Depression/Ditch Infilling—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Excavator	
	Bulldozer	
	Scraper	
Fill material placement	Haul truck	Embankment fill material
	Excavator or track hoe	Water
	Bulldozer	
Finish grading	Bulldozer	
Site restoration and demobilization	Haul truck	Hydroseed
	Motor grader	Water
	Sheepsfoot roller	
	Water truck	

Post-construction, areas used for construction staging, filling, and any other disturbed areas are hydroseeded.

2.5.8.3 Operations and Maintenance

The only post-construction permanent facility is the placed fill. O&M would be as described in Section 2.4.11.

2.5.9 Clay Ditch Lining

2.5.9.1 Objective

As described for depression/ditch infilling, ditches can contribute to risk of levee failure if a seepage pathway forms under the levee and the water then surfaces through the ditch, exploiting its less resistive nature compared to surrounding soil mass. This measure involves replacing the native material on the ditch bottom with more resistive clay to remove localized susceptibility to seepage.

Please see Table 2-4 for proposed location of clay ditch lining in the project design.

2.5.9.2 Design and Construction

Construction consists of clearing, grubbing, and stripping the ditch surface to remove vegetative material and the native soil. More resistive clay would be imported from a nearby borrow site or commercial source by haul trucks. The ditch may be further excavated to provide a surface that the clay lining may be keyed into. The haul trucks dump the material which would then be placed by excavator. Sheepsfoot rollers compact the material, and water trucks distribute water over the material to ensure proper moisture for compaction.

Equipment and materials necessary to perform clay ditch lining are listed in Table 2-16.

Table 2-16. Clay Ditch Lining—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Excavator	
	Bulldozer	
Clay lining placement	Haul truck	Clay fill
	Excavator	Water
	Water truck	
Finish grading	Bulldozer	Water
	Sheepsfoot roller	
	Water truck	
Site restoration and demobilization	Haul truck	Hydroseed
	Water truck	Water

Post-construction, areas used for construction staging, filling, and any other disturbed areas are hydroseeded.

2.5.9.3 Operations and Maintenance

The only post-construction permanent facility is the placed fill. O&M would be as described in Section 2.4.11.

2.5.10 Encroachment Removal and Vegetation Policy Compliance

2.5.10.1 Objective

Encroachments such as structures, certain vegetation, levee penetrations (e.g., pipes, conduits, and cables), power poles, pump stations, retaining walls, or similar features may require removal from the levee prism to meet standards. This measure would include the demolition of such features and relocation or reconstruction as appropriate on a case-by-case basis (or retrofit to comply with standards).

Please see Table 2-4for proposed location of encroachment removals and vegetation policy compliance activities in the project design.

2.5.10.2 Design and Construction

General Description

Encroachment removal techniques would be implemented based on the needs of the specific encroaching feature. Smaller encroachments would be removed, relocated, or retrofitted via manual labor of small crews (approximately 2 to 10 laborers) using hand tools. Larger encroachments would require machinery such as an excavator, skid-steer, and bulldozer. Dump trucks would be used for offsite hauling and disposal of removed material at a permitted commercial source. Encroachments that substantially penetrate the levee (like footings or large woody vegetation) would require levee reconstruction, discussed as a separate measure. Equipment and materials necessary for encroachment removal are listed in Table 2-17. Relocations would require similar equipment.

Table 2-17. Encroachment Removal—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Encroachment removal and/or relocation	Excavator	Debris
	Skid-steer	
	Bulldozer	
	Loader	
	Dump truck	
Site restoration and demobilization	Haul truck	Hydroseed
	Water truck	Water

Post-construction, areas disturbed by the equipment are hydroseeded.

Vegetation Policy Compliance

As introduced in Chapter 1, vegetation removal under the FRWLP would be limited only to vegetation that is in the direct disturbance footprint of the project for constructing measures to address other deficiencies (such as a slurry cutoff wall). It is not the intent for the FRWLP to be the mechanism for full compliance with USACE levee vegetation policy for the entire project area

because the FRWLP is focusing resources to address substantial geotechnical deficiencies contributing to flood risk (such as seepage). SBFCA is working cooperatively with the State of California and USACE for a long-term USACE levee vegetation policy compliance approach, but any future activity for compliance is not part of the FRWLP nor is a variance being requested at this time.

Consistent with the CVFPP guidance for levee repair or improvement, vegetation would be removed to meet specific project objectives. Any vegetation removed as part of direct construction activities would not be replaced at that location, but would require offsite, in-kind mitigation, to be determined in consultation with the appropriate resource agencies.

In accordance with USACE levee vegetation guidance, SBFCA would submit a detailed removal plan to the local USACE District Levee Safety Officer for review and comment prior to removal of vegetation. Methods for removing noncompliant vegetation are identified below.

- By excavation, remove the trunk (or stem), stump, rootball, and all roots greater than 0.5 inch in diameter—all such roots in, or within 15 feet of, the flood damage–reduction structure would be completely removed.
- Ensure that the resulting void is free of organic debris.
- Cut poles to salvage propagation materials for replanting, such as willows and cottonwoods.
- Conduct hand clearing using chainsaws and trimmers.
- Conduct mass clearing using bulldozers.

2.5.10.3 Operations and Maintenance

General O&M

Typical O&M would be as described under Section 2.4.11. Any remaining or replaced encroachments would be maintained as they were pre-project.

Management of Woody Vegetation

For woody vegetation remaining after construction, and until an alternative long-term compliance strategy is agreed upon (which may ultimately include a variance but not as part of this project), the levees would be maintained per the approved USACE O&M manual applicable to each reach (subject to revision).

2.5.11 Canal Seepage Treatment

2.5.11.1 Objective

The SBC is located adjacent to the levee toe through Reaches 26, 27, and 28. The under-seepage deficiency in these reaches occurs if the canal were to be empty and the river is at flood stage. This measure involves two optional treatments to reduce risk from under-seepage during this condition: canal hydration or relocation.

Note: A third optional treatment for this condition is implementation of a slurry cutoff wall combined with slope flattening. These measures are previously described separately.

2.5.11.2 Design and Construction

Canal Hydration Option

One option to address seepage risk through the canal is to ensure the canal is full of water (i.e., hydrated) during times of high river stage so that the water in the canal provides resistive force against any under-seepage flows. Implementing a Flood Safety Plan would allow the canal to remain in place and kept full of water at a designated flood stage. Additionally, weir structures would be constructed at the upstream and downstream ends adjacent to the sections of the canals that are located along the levee toe to keep the canal full of water. New water supply wells would also be constructed to facilitate filling of the canal, in accordance with the Flood Safety Plan, when they are not in operation, which is typically in the winter, from early October of one year to April of the following year.

Water supply wells generally are spaced at 3,200 lineal foot intervals, dependent upon the depth and production rate. Construction would be similar to that as described for relief wells, with the addition of a pump to raise the water. The pump would be powered by an electrical drop from a nearby existing power line with a diesel engine as back-up.

Weirs are constructed by clearing and grubbing the weir footprint followed by finish grading to shape the weir. The surface is lined with poured-in-place concrete with rock placed around the perimeter and aprons.

Equipment and materials necessary to construct the canal hydration option are listed in Table 2-18.

Table 2-18. Canal Hydration Option—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Scraper	
Drilling and well installation	Drill rig	Sand and gravel concrete
		Well casing
		Pipe
Weir installation	Skid-steer	Concrete
	Trench excavator or track hoe	Rock
	Concrete mixer truck	Concrete forms
Site restoration and demobilization	Equipment support vehicle	Hydroseed
	Haul truck	Water
	Motor grader	
	Sheepsfoot roller	
	Water truck	
	Small compactor	

Post-construction, areas used for construction staging and any other disturbed areas are hydroseeded.

Canal Relocation Option

Another option to address seepage risk through the canal is to fill it with earthen material in its current location and relocate it farther from the levee toe where it would present less of risk for under-seepage. This action would be as described for the depression/ditch infilling measure described previously, plus a new canal would be constructed of similar dimensions and functions as the filled canal. Equipment and materials necessary to relocate the canal are listed in Table 2-19.

Table 2-19. Canal Relocation Option—Phases, Equipment, and Materials

Phases of Construction	Equipment	Materials
Site preparation (clearing, grubbing, and stripping)	Excavator	
	Bulldozer	
	Scraper	
Fill material placement	Excavator or track hoe	Embankment fill material
	Bulldozer	Water
Canal excavation	Excavator or track hoe	
Finish grading	Bulldozer	
Site restoration and demobilization	Haul truck	Hydroseed
	Motor grader	Water
	Sheepsfoot roller	
	Water truck	

Post-construction, areas used for construction staging, filling, and any other disturbed areas are hydroseeded.

2.5.11.3 Operations and Maintenance

Canal Hydration Option

Permanent facilities associated with canal hydration option are the water supply wells, piping, and weirs, in addition to the existing canal. Water supply wells require annual maintenance and testing to ensure proper operation. Inspection of the weirs is required annually, and observation of flow from the weirs and wells and the water level in the canal is required during high river stages. An operation manual would be developed to dictate protocols and procedures for operating the wells and weirs.

Canal Relocation Option

The only post-construction permanent facilities are the placed fill and relocated canal. The filled area is subject to typical O&M as described in Section 2.4.11 and the new canal would be subject to the same O&M as the pre-project canal.

2.6 No Action Alternative

2.6.1 Introduction to No Action

Identification and analysis of a no action alternative is required pursuant to NEPA, and a no project alternative is required for CEQA. The purpose of the no action or no project alternative is to serve as a benchmark against which the effects of the action alternatives may be evaluated. For NEPA, no action is defined as those conditions that would result if USACE were to issue neither Section 408 permission nor permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. For CEQA, *no project* is defined as those conditions that would result if SBFCA were to not adopt and implement a project. Because the action alternatives would require Section 408 permission from USACE for SBFCA to implement a project, the NEPA no action and CEQA no project are considered to be the same and are simply referred to as the No Action Alternative for this EIS/EIR.

In general, the No Action Alternative consists of continuation of current conditions and O&M practices that reasonably would be expected to occur in the foreseeable future if the FRWLP was not implemented. A more detailed description of the No Action Alternative is below.

2.6.2 No Flood Risk-Reduction Measures Implemented under the No Action Alternative

Under the No Action Alternative, SBFCA would not implement flood risk-reduction measures. The levees protecting the Sutter Basin would continue to require risk-reduction measures to meet current levee standards, FEMA's minimum acceptable level of ~~flood protection~~performance, and State requirements for 200-year for urbanized areas. In addition, the associated risk to human health and safety, property, and the adverse economic effects that serious flooding could cause would continue, and the risk of a catastrophic flood would remain high. Again, however, regular O&M of the levee system would continue as presently executed by the local maintaining entities.

Because of uncertainties in local, state, and Federal funding; future state and Federal authorization; and other approvals, it is not reasonable to predict construction of levee improvements within a reasonable timeframe (see below for further discussion). Therefore, for the purpose of evaluating effects under the No Action Alternative, the EIS/EIR assumes no levee repair or strengthening would be implemented, the purpose and objectives would not be met, and the current level of flood risk would continue.

2.6.2.1 Future State or Federal Action

As these levees have known deficiencies, even if SBFCA were not pursuing improvements, it is likely that USACE and/or the State of California would repair the levees around the Sutter basin at some time in the future in order to meet Federal and/or state ~~flood protection~~level of performance obligations associated with the Federal ~~flood control~~flood risk management system.

One such example of possible Federal action is the Sutter Basin Project Feasibility Study. As discussed in Chapter 1, the study area of the Sutter Basin Project includes the FRWLP area. The primary objective of the Feasibility Study is to determine the extent of Federal interest in reducing flood risk in the study area while exploring opportunities to increase recreation and restore the

ecosystem along the Feather River and tributaries. Based on the criteria used by SBFCA to screen the FRWLP, the FRWLP project action is consistent with those considered through the Sutter Basin Project Feasibility Study process and that would be implemented by USACE or the state. The environmental effects in turn would be the same as or similar to those analyzed in this EIS/EIR (the Feasibility Study is subject to independent NEPA review). The Feasibility Study is expected to be presented to Congress for authorization in 2014, meaning the earliest that Federal levee flood risk-reduction measures would be constructed under the Feasibility Study is 2017. However, Federal funding for USACE projects has been on a downward trend, and the outlook for subsequent funding appropriation if a project were to be authorized is highly uncertain.

Other Federal programs such as the SRBPP or PL 84-99 have implemented repairs on the levees in the study area; however, these programs are targeted at dynamically shifting site-specific emergent conditions (most typically erosion) across a geographic scope widely ranging far beyond the project area. Therefore, any future repairs under these programs, even if they were to occur in the project area, would not comprehensively address the deficiencies affecting flood risk and level of protection in the planning area. Further, future authorization and appropriation of these programs is uncertain, making them unreliable from a flood-risk-management planning perspective.

At the state level, regional flood management plans are being developed under the CVFPP, including the study area. However, construction of projects under the CVFPP is presently unfunded for comprehensive and complete implementation.

Despite the possibility of eventual state- or Federally led implementation of repairs, for the purpose of evaluating effects under the No Action Alternative, the EIS/EIR assumes that flood risk-reduction measures would not occur. This assumption provides the most conservative approach for disclosure and comparison of potential effects. Again, as stated above, the No Action Alternative therefore assumes the project purpose and objectives would not be met and the current level of flood risk would continue.

2.6.2.2 Consequences of Levee Failure

Assuming that no levee repair or strengthening would occur under the No Action Alternative means that the affected area levee system would remain susceptible to failure as a result of identified deficiencies such as seepage, levee instability, and inadequate geometry. These conditions could cause portions of the levee system to fail, triggering widespread flooding, extensive damage to the planning area's existing residential, commercial, agricultural, and industrial structures, and potential loss of life and property. Extensive damage to utilities, roadways, major interstate transportation corridors, and other infrastructure systems could occur. Water supply and sewage facilities would likely fail. Floodwaters would become contaminated by chemicals released from inundated vehicles, homes, industrial and agricultural facilities, businesses, and equipment. The magnitude of the flood damage would depend upon the location of the levee breach, severity of the storm, and river flows at the time of a potential levee failure.

Flood depth maps prepared for the affected area indicate that under a 200-year flood event scenario, inundation levels would range from 1 foot to 25 feet, depending on the local elevation of the land surface. Plates 2-13 through 2-19 show the ultimate estimated inundation depths for a 200-year flood event based on levee failures from north to south (upstream to downstream), as well as a composite of failures along the project area levee.

As of 2010, there were 99,154 people living in both the incorporated and unincorporated areas of Sutter County. Nearly two-thirds of these residents live in the City of Yuba City and Live Oak (California Department of Finance 2010). As of April 2010 there were 33,858 housing units within Sutter County. As of 2010, there were 221,768 residents living in in both the incorporated and unincorporated areas of Butte County (California Department of Finance 2010). As of April 2010 Butte County had 95,835 total housing units (California Department of Finance 2011). While it should be acknowledged that the planning area reaches only into a small portion of Butte County, in a flood event, far more would be affected than only those people and residences in the planning area.

Manyof these residents could be displaced by a catastrophic flood event and residences damaged or destroyed. as of 2009, Sutter County is home to 25,860 wage and salary jobs (California Department of Transportation 2012a), 328,208 acres of farmland, 1,171 acres of commercial and industrial zoned land, and 44,919 acres of open space, golf courses, and parks (Sutter County 2010). As of 2009 Butte County is home to 75,258 wage and salary jobs (California Department of Transportation 2012b) It is also home to 599,040 acres of farmland, 5,544 acres of commercial, office and industrial zoned land, and 178,400 acres of open space (Butte County 2010). These lands, in both counties, would all be affected by a flood event. Agricultural resources could also sustain major damage in a flood event considering roughly 86% and 58% of Sutter and Butte counties' land, respectively, is used to support that industry. If a catastrophic flood event occurred it would result in the loss of hundreds of thousands of dollars in agricultural lands, employment centers, homes and other structures.

A flood event could cause severe public health hazards as well. Flooding could upset and spread stored hazardous materials, creating hazardous conditions for the public and the environment. Flood damage to homes and other structures could render them dangerous, due to structural damage as well as contamination. Additionally, the floodwaters and ponds left behind could provide a wide breeding ground for mosquitoes and other disease vectors. Effects to the water supply system could be particularly severe in a flood event, and could leave residents and businesses without a reliable water supply for a significant amount of time. In population centers such as Yuba City, a single break in a water delivery pipe or main could contaminate the entire city's water supply. A major flood event could also result in substantial stress or disruption to the region's emergency response capacity, hospital services, and other critical lifelines.

During the recovery period after a flood event, area residents would require temporary housing, and displacement of many or all occupants would occur while levees, buildings, and other infrastructure were repaired. Businesses, social services, and other employers occupying affected structures would be forced to relocate. The potential number of displaced residents and lost businesses resulting in demand for temporary quarters would likely exceed the available supply of vacant buildings surrounding the project area. Thus, many displaced residents and businesses may be forced to relocate to areas a considerable distance from affected area communities, resulting in substantial intermediate-term and long-term economic effects on the area and its people. These effects include changes in employment numbers and patterns, business and personal incomes, tax revenues, and regional economic activity.

A flood event in the affected area would also disrupt state and interstate highway and rail traffic, causing long-term effects on the region's and the state's economy and ability to move people and goods. Flooding of this transportation and distribution infrastructure would cut off major statewide and interstate transportation corridors. Other critical facilities and infrastructure are listed in Table 1-5.

2.6.3 Relationship of FEMA RiskMAP to No Action

Further complicating the future no action scenario is the FEMA RiskMAP process, a national effort to revise FIRMs. FEMA is in the process of reevaluating the level of ~~flood protection~~performance provided by the levee system protecting the planning area. Portions of the planning area are currently designated as falling under Zone X, meaning it has less than a 1% chance of flooding in any given year (100-year ~~flood protection~~level of performance). If these areas were remapped out of Zone X and into an A, AE, AR, or A-99 Zone, flood insurance would become mandatory for all citizens and businesses that hold Federally guaranteed mortgage loans. In addition, Federal and state regulations would prevent or constrain further development in the basin.

FEMA flood zone mapping from 202+50 in the south to Stewart Road in the north reflects that those lands are categorized as Special Flood Hazard Areas (this includes A, AE, AR, AH, AO, Zone V, Zone VE, and A-99 Zones) and are subject to inundation by the 1% annual chance of flooding. More specifically, lands nearest the west levee of the Feather River are categorized as AE, meaning base flood elevations have been determined. The west levee of the Feather River from the Sutter/Butte County line to the Thermalito Afterbay is categorized as Zone A, in which base flood elevations have not been determined. Lands to the west of the levee in this area are primarily categorized as Zone X. Mapping of lands between Stewart Road and the Sutter/Butte County line is in progress and is expected in 2014 (Plate 2-20).

2.6.4 Levee Vegetation Policy and No Action

Compliance with USACE levee vegetation policy in the Sacramento Valley is complex, due to the overlays of flood management objectives, protected fish and wildlife habitat, environmental regulations, overlapping jurisdictional authorities, and recreation and other social values.

In light of these circumstances, the No Action Alternative reflects multiple possible future scenarios. At this time, it is considered too speculative to adopt and consider a single one of these future scenarios as the sole or most likely outcome. Therefore, this document acknowledges and analyzes the following conditions in regard to the USACE levee vegetation policy as it relates to the No Action Alternative for the actions under consideration.

- Full application of USACE levee vegetation policy, as detailed in the ETL, meaning prohibition and removal of woody vegetation within the levee prism or within 15 feet of the landside or waterside levee toes (U.S. Army Corps of Engineers 2009).
- Modified application of the ETL; assumes the continued existence into the future of the vegetation conditions at the time of the analysis. This may include future application of a variance (not as part of the FRWLP) or application of the CVFPP concepts for management of woody vegetation, meaning trimming and thinning to allow visibility and accessibility, selective retention and removal based on engineering inspection and evaluation, and LCM (as described under encroachment removal and vegetation policy compliance). A system-wide improvement framework (SWIF) may also be a component of future compliance.

2.7 Alternative Screening

2.7.1 Screening Criteria

SBFCA established and applied nine criteria to qualitatively evaluate measures and alternatives and eliminate those that did not adequately meet the criteria. The criteria are below, along with the options for evaluation. Public feedback, including that gained through the NEPA and CEQA process, is considered as part of the evaluation in screening.

An alternatives analysis per the guidelines of 404(b)(1) for a CWA Section 404 Individual Permit would be conducted separately, if required.

- **Meet the project objectives to reduce risk.** The objective of the project is to address flood management deficiencies of through- and under-seepage, erosion, and slope stability on the Feather River West Levee to make a substantial contribution toward achieving 100-year protection for the entire assessment district and 200-year for the populated areas. This criterion is essentially a pass or fail evaluation and a failing alternative would be eliminated from further consideration.
- **Geography and jurisdictional authority.** This criterion eliminates those measures that are outside the control of SBFCA as a sponsor to implement, operate, and/or maintain. This criterion is essentially a pass or fail evaluation and a failing alternative would be eliminated from further consideration.
- **Avoidance of hydraulic effects.** An alternative must not measurably and substantially increase or transfer flood risk within or outside the affected area (upstream, adjacent, or downstream). This criterion is essentially a pass or fail evaluation and a failing alternative would be eliminated from further consideration.
- **Land use compatibility**. The current and planned land use of the affected area should be taken into consideration. If known projects exist or have been locally approved, alternatives should be evaluated with consideration of the degree to which they disrupt or interfere with such land uses. Alternatives that do not require modification to existing land-use plans are favored; specifically, alternatives that are consistent with facilitating continued agriculture and sustainable smart growth and economic development. This criterion would be evaluated as a relative scale, such as less, moderately, or more favorable.
- **Avoidance, minimization, and mitigation of environmental effects.** This is an important criterion to ensure an alternative does not have onerous environmental effects relative to other alternatives, and, moreover, that alternatives are selected to avoid, minimize, and mitigation environmental effects (in that order of precedence). The purpose is to ensure that a proposed project minimizes effects on the environment as well as avoiding permitting process which may delay the project or increase cost. This criterion would be evaluated as a relative scale, such as less, moderately, or more favorable.
- **Facilitation of multi-use objectives.** While the FRWLP is focused on flood management only, it should not preclude opportunities for future recreation and ecosystem restoration, consistent with the Feasibility Study goals and the State's criteria. Alternatives that facilitate or do not preclude realization of other objectives within the project area are favored. This criterion would be evaluated as a relative scale, such as less, moderately, or more favorable.

- **Cost.** Costs for construction, operations, and maintenance are considered and compared relative to one another and means of applicable local, state, and Federal programs. This criterion would be evaluated as a relative scale, such as less, moderately, or more favorable.

2.7.2 Measures and Alternatives Not Carried Forward

Several measures and alternatives for the FRWLP were considered but not carried forward based on the screening criteria presented above. These alternatives are briefly described below.

2.7.2.1 Alternative Levee Alignments

Construction of a new levee may allow for higher certainty as to how the levee meets Federal and State standards for factors such as through- and under-seepage, geometry, and slope stability. For example, the selection and placement of embankment fill can be directly controlled according to current standards using modern construction, material testing, and inspection practices. Moreover, construction of a new levee also allows for consideration of a new alignment (i.e., location) factoring hydrology, hydraulics, habitat, land use, characteristics of the area to be protected, O&M needs, and other factors. Three types of alternative levee alignments were considered for the FRWLP, described below.

Setback Levees

The concept of a setback levee is to construct a new levee landward of the existing levee alignment, whereby the old levee is then often degraded, breached, or partially removed to allow expansion of the floodplain. A new levee would be built to meet current Federal and State standards. Table 2-20 summarizes the analysis of setback levees relative to the screening criteria.

Table 2-20. Setback Levee Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Pass; a setback levee could be designed and implemented to meet the project objectives.
Geography and jurisdictional authority	Pass; a setback levee could be designed and implemented within SBFCA's area and scope of authority.
Avoidance of hydraulic effects	Pass; a setback levee could be designed and implemented to avoid hydraulic effects within and outside of the affected area.
Land use compatibility	Less favorable; a setback levee may affect land uses by converting current land uses such as agriculture, residential, and commercial and subjecting additional lands to flooding.
Avoidance, minimization, and mitigation of environmental effects	Less to moderately favorable; while a setback levee may allow for substantial environmental benefits by increasing fish and wildlife habitat, it may also have significant environmental effects on land use, mineral resources, transportation, air quality, noise, and other resources.
Facilitation of multi-use objectives	More favorable; a setback levee may allow for accommodation of flood management, fish and wildlife habitat, recreation, and agriculture within the expanded floodplain.
Cost	Less favorable; a setback levee may have high implementation costs due to land acquisition, materials, and earthwork ($8,000 to 10,000 per linear foot compared to $1,200 to 2,000 per linear foot for fix-in-place measures).

Setback levees within the project area do not fail any of the critical pass/fail criteria; however, they do not rate as well in the categories of land use compatibility, environmental effects, and cost for the study reaches relative to actions focused on addressing deficiencies of the Feather River West Levee in place. Setback levees have been removed from going forward as part of the FRWLP but merit further evaluation for other reaches within the study area but outside of the FRWLP. They are specifically under consideration for future action south of the FRWLP where there may be fewer constraints from land use, environmental effects, and cost, as well as potentially greater benefits from multiple floodplain uses.

Ring Levees

The concept of a ring levee is to construct a new levee surrounding a select area to be protected, such as a population center like Yuba City. Ring levees focus on decreasing flood risk~~increasing flood protection~~ for the area within the ring while not addressing the level of protection outside of the ring. Table 2-21 summarizes the analysis of ring levees relative to the screening criteria.

Table 2-21. Ring Levee Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Fail; ring levee(s) may achieve 200-year protection for the area within the ring (or areas within multiple rings) but would not address the project objective to reduce flood risk for the entire planning area. The vast majority of the planning area would remain at current or heightened risk levels, especially agricultural communities, commodities, and infrastructure.
Geography and jurisdictional authority	Pass; ring levee(s) could be designed and implemented within SBFCA's area and scope of authority.
Avoidance of hydraulic effects	Fail; ring levee(s) may increase the risk of flooding outside the area protected by the ring.
Land use compatibility	Less favorable; ring levee(s) may affect land uses by subjecting substantial lands to flooding by not reducing flood risk outside of the ring and by changing land use for the direct footprint of the levee.
Avoidance, minimization, and mitigation of environmental effects	Less to moderately favorable; ring levee(s) may have significant environmental effects on land use, mineral resources, transportation, air quality, noise, and other resources.
Facilitation of multi-use objectives	Less to moderately favorable; ring levee(s) may allow for accommodation of flood management, fish and wildlife habitat, recreation, and agriculture outside of the ring.
Cost	Less favorable; ring levee(s) may have high implementation costs due to land acquisition, materials, and earthwork.

Ring levees within the project area fail at least two of the critical pass/fail criteria and also do not rate as well in nearly all other categories relative to actions focused on addressing deficiencies of the Feather River West Levee in place. Ring levees have been removed from going forward as part of the FRWLP.

J-Levee

A J-levee is a special hybrid of repair-in-place of existing levees and ring levees, with the "J" referring to the shape of the levee in planform. Rather than entirely encircling a limited area like a ring levee,

a J-levee would combine repair-in-place of existing levees connected with a partial ring levee (forming the "J" shape). Specifically, a J-levee has been studied in the mid/northern part of the project area, where the long leg of the "J" corresponds to the existing Feather River West Levee and the hook part of the ''J" represents a new levee alignment heading to the west just south of Yuba City. The area north of the J-levee would be designed to a 200-year level of protection but the area south of the "J" would receive lesser protection. Table 2-22 summarizes the analysis of a J-levee relative to the screening criteria.

Table 2-22. J-Levee Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Uncertain; a J-levee levee may need further evaluation to determine ability to meet the project objective to reduce flood risk for the entire planning area.
Geography and jurisdictional authority	Pass; a J-levee could be designed and implemented within SBFCA's area and scope of authority.
Avoidance of hydraulic effects	Uncertain; a J-levee may need further evaluation to determine avoidance of hydraulic effects within and outside of the planning area.
Land use compatibility	Less favorable; a J-levee may affect land uses by subjecting additional lands to flooding and by changing land use for the direct footprint of the hook part of the ''J" levee.
Avoidance, minimization, and mitigation of environmental effects	Less to moderately favorable; a J-levee may also have significant environmental effects on land use, mineral resources, transportation, air quality, noise, and other resources.
Facilitation of multi-use objectives	Moderately to more favorable; a J-levee may allow for accommodation of flood management, fish and wildlife habitat, recreation, and agriculture outside of the J levee.
Cost	Less favorable; a J-levee may have high implementation costs due to land acquisition, materials, and earthwork.

A J-levee has uncertainty relative to the critical pass/fail criteria and does not rate as well in nearly all other categories relative to actions focused on addressing deficiencies of the Feather River West Levee in place. A J-levee has been removed from going forward as part of the FRWLP.

2.7.2.2 Reoperation of Upstream Reservoirs and Bypasses

Upstream reservoirs are currently operated to meet a number of different objectives, including water supply, flood management, power production, water quality, and fisheries. Similarly, the bypass system that is part of the SRFCP to reduce peak flows from the primary river channels is governed by complex operating criteria. Table 2-23 summarizes the analysis of reoperation of upstream reservoirs and bypasses relative to the screening criteria.

Table 2-23. Reoperation of Upstream Reservoirs and Bypasses Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Uncertain; reoperation of upstream reservoirs and bypasses may need further evaluation to determine ability to meet the project objective to reduce flood risk for the entire planning area.
Geography and jurisdictional authority	Fail; reoperation of upstream reservoirs and bypasses could not be planned and implemented within SBFCA's area and scope of authority and would require cooperation with numerous Federal, state, and local agencies.
Avoidance of hydraulic effects	Uncertain; reoperation of upstream reservoirs and bypasses may need further evaluation to determine avoidance of hydraulic effects within and outside of the planning area.
Land use compatibility	Moderately to more favorable; reoperation of upstream reservoirs and bypasses would not affect land uses although changed hydrology could affect uses within the bypass and reservoir footprints.
Avoidance, minimization, and mitigation of environmental effects	Moderately to more favorable; reoperation of upstream reservoirs and bypasses would not affect land uses although changed hydrology could affect habitat within the bypass and reservoir footprints.
Facilitation of multi-use objectives	Uncertain; reoperation of upstream reservoirs and bypasses could affect boating and fishing by changing water levels and flows within those facilities and the river channel as well as affecting shoreline habitat; in addition, agriculture within bypasses could be affected as well as shoreline recreational facilities in bypasses and at reservoirs.
Cost	Uncertain; reoperation of upstream reservoirs and bypasses has unknown costs in terms of modifications to these facilities to accommodate different operating regimes.

Reoperation of reservoirs and bypasses to optimize attenuation of flood flows could potentially reduce flood risk to SBFCA, but may compromise the ability to meet other mandated management objectives. Given that many agencies and other stakeholders would need to be involved, it is unlikely that an agreement with respect to reoperation would be reached in the near term, if possible at all to achieve any meaningful benefit to SBFCA. Based on the screening criteria, this alternative has many uncertain ratings and a failure rating in a critical category; therefore, it has not been carried forward as part of the FRWLP.

2.7.2.3 Development of Additional Upstream Storage

Similar to reoperation of upstream reservoirs, development of increased capacity for flood water storage within the SRFCP upstream of SBFCA's area (such as through new reservoirs, enlarged bypasses, and setback levees) presents a possibility for reducing flood risk within the planning area. Table 2-24 summarizes the analysis of developing additional upstream storage relative to the screening criteria.

Table 2-24. Development of Additional Upstream Storage Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Uncertain; development of additional upstream storage may need further evaluation to determine ability to meet the project objective to reduce flood risk for the entire planning area.
Geography and jurisdictional authority	Fail; development of additional upstream storage could not be planned and implemented within SBFCA's area and scope of authority and would require cooperation with numerous Federal, state, and local agencies.
Avoidance of hydraulic effects	Uncertain; development of additional upstream storage may need further evaluation to determine avoidance of hydraulic effects within and outside of the planning area.
Land use compatibility	Less favorable; development of additional upstream storage may affect land uses if reservoirs and bypasses would need to be increased in footprint to allow additional capacity, which would require land acquisition and land use change.
Avoidance, minimization, and mitigation of environmental effects	Less favorable; development of additional upstream storage may have substantial environmental effects if reservoirs and bypasses would need to be increased in footprint to allow additional capacity.
Facilitation of multi-use objectives	Uncertain; development of additional upstream storage could affect boating and fishing by changing water levels and flows within those facilities and the river channel as well as affecting shoreline habitat; in addition, agriculture within bypasses could be affected as well as shoreline recreational facilities in bypasses and at reservoirs.
Cost	Uncertain; development of additional storage has unknown costs in terms of modifications to these facilities.

Likewise with reoperation of upstream reservoirs and bypasses, SBFCA does not own or control upstream properties for developing additional storage. Based on the screening criteria, this alternative has many uncertain ratings and a failure rating in a critical category; therefore, it has not been carried forward as part of the FRWLP.

2.7.2.4 Construction of Feather River Bypass

This alternative would construct a new bypass that would divert flows from the Feather River near the Thermalito Afterbay to an expanded Cherokee Canal and Sutter Bypass. This would entail building a new bypass canal along the top of the Sutter Basin from the Feather River to Cherokee Canal, expanding Cherokee Canal to the Sutter Bypass, and expanding the Sutter Bypass to the Feather River confluence. Table 2-25 summarizes the analysis of the development and construction of a Feather River Bypass relative to the screening criteria.

Table 2-25. Construction of Feather River Bypass Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Fail; construction of a new bypass, while it would divert peak flows, would not address under-seepage and through-seepage risk from the Feather River West Levee.
Geography and jurisdictional authority	Fail; construction of a new bypass could not be planned and implemented within SBFCA's area and scope of authority and would require cooperation with numerous Federal, state, and local agencies.
Avoidance of hydraulic effects	Uncertain; construction of a new bypass has the potential to significantly change the hydraulics of the Cherokee Canal and the Sutter Bypass with unknown consequences.
Land use compatibility	Uncertain; construction of a new bypass may affect land use such as agriculture in the Sutter Bypass; roads, railroads, and irrigation canals would need to be modified to accommodate the new bypass and existing residential and other structures would need to be removed/relocated.
Avoidance, minimization, and mitigation of environmental effects	Uncertain; construction of a new bypass would have considerable construction-related effects such as equipment emissions; effects on resources within the construction footprint are not known.
Facilitation of multi-use objectives	More favorable; the construction of a new bypass could expand fish and wildlife habitat and recreation.
Cost	Less favorable; the cost of constructing a new bypass would exceed the cost of fix-in-place measures and also necessitates enlarging of the Cherokee Canal and Sutter Bypass, which would incur more costs.

While a new bypass diverting water to Cherokee Canal and the Sutter Bypass would result in water surface elevation reductions, reductions would be relatively modest in the lower reaches of the Feather River and would be unlikely to sufficiently reduce risk from under-seepage and through-seepage. Based on the screening criteria, this alternative has many uncertain ratings and failure ratings in critical categories; therefore, it has not been carried forward as part of the FRWLP. However, it should be noted that USACE identified this measure in the Sutter Basin Project Feasibility Study; therefore, it may be pursued separate from the FRWLP.

2.7.2.5 Raising Building Pads

This alternative involves raising building pads to an elevation above the floodplain. Table 2-26 summarizes the analysis of raising building pads relative to the screening criteria.

Table 2-26. Raising Building Pads Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Fail; raising building pads would not meet the objective to reduce flood risk for the entire planning area because approximately 30,000 existing structures would need to be modified which is not reasonably feasible and because tens of thousands of acres of agricultural lands would remain at risk.
Geography and jurisdictional authority	Pass; raising building pads would be in the area and scope of authority of SBFCA through its member agencies.
Avoidance of hydraulic effects	Pass; raising building pads would not likely induce hydraulic effects within or outside of the planning area.

Criterion	Comment
Land use compatibility	More favorable; raising building pads would likely not affect land use.
Avoidance, minimization, and mitigation of environmental effects	Less favorable; raising building pads may have substantial environmental effects on mineral resources, transportation, air quality, noise, and other resources through extensive construction activities to implement.
Facilitation of multi-use objectives	More favorable; raising building pads would not preclude multi-use objectives.
Cost	Less favorable; raising building pads would have substantial costs to implement and would be complicated by implementation on private facilities.

While it may be technically possible for existing development to be retrofitted to be flood-proofed or to raise all habitable buildings above the 200-year ~~flood~~ level and for new development to be designed and built to this standard, implementation would require substantial cost, time, and re-evaluation of environmental effects and local permitting, review, and approval processes. This alternative would not substantially meet the project objectives in that it would not reduce flood risk in an expedited fashion for the entire population of the planning area due to the fact that construction activities would likely be staged over tens of years, leaving parts of the population at greater risk than others. Furthermore, it would not reduce flood risk~~provide flood protection~~ for all property because farmland, non-habitable buildings, streets, and parking lots would not be raised above the 100-year or 200-year ~~flood~~ level. Further complicating this alternative is that potential flood depths in the some parts of the affected area are too great to feasibly enable the raising of building pads or structural retrofits. Based on the screening criteria, this alternative has not been carried forward as part of the FRWLP.

2.7.2.6 River Dredging

This measure, which likely would be a component of an alternative rather than a complete alternative unto itself, would entail removal of river bottom material via dredging to increase channel capacity. Dredging would be conducted from a barge via clamshell or suction cutter head and the deposits would be placed outside the river channel on floodplain areas or landward of the levee. Dredging would likely entail ongoing maintenance dredging to restore channel capacity because siltation over time would replace the removed material. Table 2-27 summarizes the analysis of river dredging.

Table 2-27. River Dredging Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Fail; river dredging may result in localized increases in channel capacity but would not reduce water surface elevation sufficiently to reduce risk from seepage from the Feather River West Levee.
Geography and jurisdictional authority	Pass; river dredging could be planned and implemented within SBFCA's area and scope of authority with cooperation from numerous Federal, state, and local agencies.
Avoidance of hydraulic effects	Uncertain; river dredging has the potential to significantly change river hydraulics, especially upstream and downstream effects.
Land use compatibility	More favorable; river dredging would have no effect on land use except for dredge disposal areas, which could be designed to be compatible with land use.

Criterion	Comment
Avoidance, minimization, and mitigation of environmental effects	Less favorable; dredging may be considerably constrained by fish and wildlife habitat and water quality restrictions within the aquatic environment of the dredging activity as well as the terrestrial environment of the dredge disposal sites.
Facilitation of multi-use objectives	Moderately favorable; dredging would neither create nor preclude opportunities for recreation or habitat.
Cost	Less favorable; river dredging would not by itself address any of the deficiencies relative to state and Federal levee criteria, and therefore would not be cost-effective because other measures would need to be employed.

Because river dredging by itself does not directly or substantially contribute toward addressing any of the deficiencies in the project area, it has not been carried forward as part of the FRWLP.

2.7.3 Screening of Alternatives Carried Forward

2.7.3.1 Alternative 1

This alternative entails constructing a cutoff wall along the centerline of the existing levee to a varying depth and a seepage berm along a portion of the landside levee toe; a detailed description is presented earlier in this chapter. The Alternative 1 screening summary is provided in Table 2-28.

Table 2-28. Alternative 1 Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Pass; Alternative 1 could be designed and implemented to meet the project objectives to address levee deficiencies and achieve the target levels of protection.
Geography and jurisdictional authority	Pass; construction of Alternative 1 would be in the area and scope of authority of SBFCA through its member agencies.
Avoidance of hydraulic effects	Pass; Alternative 1 would not likely induce hydraulic effects within or outside of the planning area and could be designed and constructed for hydraulic benefit or neutrality.
Land use compatibility	More favorable; Alternative 1 keeps predominantly within the existing FRWLP footprint minimizing land use changes.
Avoidance, minimization, and mitigation of environmental effects	More favorable; the smaller footprint of Alternative 1 would minimize environmental effects although some loss of vegetation would be required for project constructability.
Facilitation of multi-use objectives	Moderately favorable; Alternative 1 would neither create nor preclude opportunities for recreation or habitat.
Cost	Less favorable; cutoff walls are costly to construct.

Alternative 1 minimizes real estate acquisitions and changes in land use, however the cost of utilizing cutoff walls as the primary flood management measure may be a limitation. This alternative was recommended for further consideration and inclusion in the NEPA/CEQA analysis.

2.7.3.2 Alternative 2

This alternative entails constructing seepage and stability berms along the landside toe of the levee and a shallow cutoff wall along a portion of the centerline of the levee. Alternative 2 also included filling the existing canal adjacent to the levee in Reaches 26, 27, and 28 with water during periods of high water surface elevation in the river; a detailed description is presented earlier in this chapter. The Alternative 2 screening summary is presented in Table 2-29.

Table 2-29. Alternative 2 Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Pass; Alternative 2 could be designed and implemented to meet the project objectives to address levee deficiencies and achieve the target levels of protection.
Geography and jurisdictional authority	Pass; constructing Alternative 2 would be in the area and scope of authority of SBFCA through its member agencies.
Avoidance of hydraulic effects	Pass; constructing seepage and stability berms would not likely induce hydraulic effects within or outside of the planning area and could be designed and constructed for hydraulic benefit or neutrality.
Land use compatibility	Less favorable; Alternative 2 requires considerable land acquisition which could result in relocation of a large number of homes and infrastructure.
Avoidance, minimization, and mitigation of environmental effects	Less favorable; Alternative 2 may have substantial environmental effects on air quality, transportation, and noise because of the greater amount of earthwork required.
Facilitation of multi-use objectives	Moderately favorable; Alternative 2 would neither create nor preclude opportunities for recreation or habitat.
Cost	Less to moderately favorable; cost of constructing seepage and stability berms is less expensive than cutoff walls, but more property would need to be acquired for project execution and environmental mitigation costs would be higher. Borrow needs would be considerably greater, necessitating acquisition, transportation, and placement, and reclamation.

Alternative 2 effectively addresses the identified levee deficiencies, and may be less in cost compared to measures within the levee footprint, however the use of seepage and stability berms expands environmental effects across the entire project area. This alternative was recommended for further consideration and inclusion in the NEPA/CEQA analysis.

2.7.3.3 Alternative 3

This alternative entails combining flood management measures from Alternative 1 and Alternative 2 to produce the optimized alternative to avoid and minimize environmental effects. This alternative proposes a combination of cutoff walls and berms (along with other measures); a detailed description is presented earlier in this chapter. The Alternative 3 screening summary is presented in Table 2-30.

Table 2-30. Alternative 3 Screening Summary

Criterion	Comment
Meet the project objectives to reduce risk	Pass; Alternative 3 could be designed and implemented to meet the project objectives to address levee deficiencies and achieve the target levels of protection.
Geography and jurisdictional authority	Pass; constructing Alternative 3 would be in the area and scope of authority of SBFCA through its member agencies.
Avoidance of hydraulic effects	Pass; constructing Alternative 3 would not likely induce hydraulic effects within or outside of the planning area and could be designed and constructed for hydraulic benefit or neutrality.
Land use compatibility	More favorable; although Alternative 3 employs seepage and stability berms in several locations, the primary measure to be utilized is cutoff walls minimizing required land use changes.
Avoidance, minimization, and mitigation of environmental effects	More favorable; Alternative 3 would have some environmental effects because of the limited number of seepage and stability berms, but the project primarily would remain within the existing levee footprint by utilizing cutoff walls as the most employed measure.
Facilitation of multi-use objectives	Moderately favorable; Alternative 3 would neither create nor preclude opportunities for recreation or habitat.
Cost	More favorable; Alternative 3 primarily utilizes cutoff walls which is less expensive than other measures considered.

Alternative 3 effectively addresses the identified levee deficiencies, is compatible with land use plans, requires minimal real estate acquisition, avoids or minimizes environmental effects, is cost effective, and has a moderate footprint. This alternative was recommended for further consideration and inclusion in the NEPA/CEQA analysis and has been identified as the APA.

Chapter 3
Affected Environment and Environmental Consequences

This chapter provides the affected environment and environmental consequences for the FRWLP EIS/EIR. The baseline environmental conditions assumed in the preparation of this chapter consist of the existing physical environment as of May 20, 2011, when SBFCA published the Notice of Preparation (NOP) to prepare an EIR with the State Clearinghouse. USACE published a Notice of Intent (NOI) to prepare an EIS in the Federal Register on May 20, 2011. The chapter contents are listed below.

- Section 3.1, ~~*Flood Control*~~*Flood Risk Management* *and Geomorphic Conditions*
- Section 3.2, *Water Quality and Groundwater Resources*
- Section 3.3, *Geology, Soils, Seismicity, and Mineral Resources*
- Section 3.4, *Traffic, Transportation, and Navigation*
- Section 3.5, *Air Quality*
- Section 3.6, *Climate Change and Greenhouse Gas*
- Section 3.7, *Noise*
- Section 3.8, *Vegetation and Wetlands*
- Section 3.9, *Wildlife*
- Section 3.10, *Fish and Aquatic Resources*
- Section 3.11, *Agriculture, Land Use, and Socioeconomics*
- Section 3.12, *Population, Housing, and Environmental Justice*
- Section 3.13, *Visual Resources*
- Section 3.14, *Recreation*
- Section 3.15, *Utilities and Public Services*
- Section 3.16, *Public Health and Environmental Hazards*
- Section 3.17, *Cultural Resources*

3.1 Flood ~~Control~~ Risk Management and Geomorphic Conditions

3.1.1 Introduction

This section describes the regulatory and environmental setting for ~~flood control~~flood risk management and geomorphic conditions; effects on ~~flood control~~flood risk management and geomorphic conditions that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.1.2 Affected Environment

This section describes the affected environment for ~~flood control~~flood risk management and geomorphic conditions in the project area. The key sources of data and information used in the preparation of this section are listed below.

- Butte County Multi-Jurisdictional All-Hazard Pre-Disaster Mitigation Plan (Butte County 2007).
- Butte County General Plan 2030 (Butte County 2010).
- City of Gridley 2030 General Plan (City of Gridley 2010).
- City of Live Oak 2030 General Plan (City of Live Oak 2010).
- City of Yuba City General Plan (City of Yuba City 2004).
- Design Water Surface Profiles for the Feather River West Levee Project (Peterson Brustad 2012a)
- Design Water Surface Profiles for the Feather River West Levee Project Addendum #1 (Peterson Brustad 2012b)
- 'With-Project' Hydraulics Analysis for the Feather River West Levee Project (Peterson Brustad 2012d)
- Sutter Basin Feasibility Study Hydraulics Report (Peterson Brustad 2012c)
- Geologic map of the late Cenozoic deposits of the Sacramento Valley and northern Sierran foothills, California (Helley and Harwood 1985).
- Preliminary Problem Identification and Conceptual Alternatives Analysis Report Feather River West Levee Evaluation, Volumes 1 and 2 (Kleinfelder 2009).
- City of Biggs General Plan 1997–2015 (City of Biggs 1998).
- Sutter Butte Flood Control Agency's Early Implementation Program Project Report for the Feather River West Levee Rehabilitation Project (Peterson Brustad 2010).
- Sutter County General Plan Update Technical Background Report (Sutter County 2008).
- Sutter County General Plan, Public Draft (Sutter County 2010).
- Phase 1 Geotechnical Data Report (P1GDR), Sutter Study Area (URS 2008a).

- Phase 1 Preliminary Geotechnical Evaluation Report (P1GER), Sutter Study Area (URS 2008b).
- Supplemental Geotechnical Data Report (SGDR), Sutter Study Area (URS 2010).
- Sacramento and San Joaquin River Basins Comprehensive Study, December 2002 Interim Report (U.S. Army Corps of Engineers 2002a).
- Sacramento and San Joaquin River Basins Comprehensive Study, Technical Studies Documentation, December 2002 (U.S. Army Corps of Engineers 2002b).
- Geomorphic Analysis of Reach from Colusa to Red Bluff Diversion Dam, River Mile 143 to River Mile 243: Final Phase II Report (Water Engineering & Technology 1989).
- Geomorphic Analysis and Bank Protection Alternatives Report for Sacramento River (RM 78–194) and Feather River (RM 0–28) (Water Engineering & Technology 1990a).
- Geomorphic Analysis of the Sacramento River, Phase II Report (Water Engineering & Technology 1990b).
- Geomorphic Analysis and Bank Protection Alternatives Report for Sacramento River (RM 0–78), Feather River (RM 29–61), Yuba River (RM 0–11), Bear River (RM 0–17), American River (RM 0–23), and portions of Three Mile, Steamboat, Sutter, Miner, Georgiana, Elk and Cache Sloughs (Water Engineering & Technology 1991).
- Butte County Flood Mitigation Plan (Wood Rodgers 2006).

3.1.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to ~~flood control~~flood risk management and geomorphic conditions. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to ~~flood control~~flood risk management and geomorphic conditions may apply to implementation of the proposed project. Additional Federal policies potentially relevant to the implementation of the project can be found in Appendix A.

National Flood Insurance Program

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were intended to reduce the need for large, publicly funded ~~flood control~~flood risk management structures and disaster relief by restricting development on floodplains. FEMA administers the NFIP to subsidize flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues FIRMs for communities participating in the NFIP. These maps delineate flood hazard zones in the community. These maps are designed for flood insurance purposes only and do not necessarily show all areas subject to flooding. The maps designate lands likely to be inundated during a 100-year storm event and elevations of the base flood. They also depict areas between the limits affected by 100-year and 500-year events and areas of minimal flooding. These maps often are used to establish building pad elevations to protect new development from flooding effects. The locations of FEMA-designated floodplains in the proposed planning area are discussed in Section 3.1.2.2, *Environmental Setting*.

Requirements for Federal Emergency Management Agency Certification

For guidance on floodplain management and floodplain hazard identification, communities turn to FEMA guidelines, as defined in 44 CFR 59 through 77. In order for a levee to be recognized by FEMA under the NFIP, the community must provide evidence demonstrating that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood (1% or 100-year flood) exists. These specific requirements are outlined in 44 CFR 65.10, Mapping of Areas Protected by Levee Systems, and are summarized below.

Levee height. Riverine levees must provide a minimum freeboard (the height of the top of a levee above a given level of water in a river) of 3 feet above the water-surface level of the base flood. An additional 1 foot above the minimum is required within 100 feet of either side of structures (such as bridges) riverward of the levee or wherever the flow is constricted. An additional 0.5 foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, also is required.

Closures. All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.

Embankment protection. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.

Embankment and foundation stability. Engineering analyses that evaluate levee embankment stability must be submitted to FEMA. The analyses provided must evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability.

Settlement. Engineering analyses must be submitted that assess the potential and magnitude of future losses of levee height as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum standards.

Interior drainage. An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood.

Operation plans. For a levee system to be recognized, a formal plan of operation must be provided to FEMA. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operational manual, a copy of which must be provided to FEMA.

Maintenance plans. For levee systems to be recognized as providing protection from the base flood, they must be maintained in accordance with an officially adopted maintenance plan. All maintenance activities must be under the jurisdiction of a Federal or state agency, an agency created by Federal or state law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance. The plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, maintenance plans must specify the maintenance activities to be

performed, the frequency of their performance, and the person by name or title responsible for their performance.

U.S. Army Corps of Engineers Levee Design Criteria

All levees included in the proposed project area are Federally authorized and fall within the jurisdiction of USACE. The levee evaluation for the proposed project area conforms to the engineering criteria established by USACE for the assessment and repair of levees. USACE technical criteria in the following list should be used as guidance unless noted otherwise.

- Overtopping of Flood Control Levees and Floodwalls (Publication ETL 1110-2-299, August 22, 1986).
- Structural Design of Closure Structures for Local Flood Protection Projects (Publication EM 1110-2-2705, March 31, 1994).
- Design of Coastal Revetments, Seawalls, and Bulkheads (Publication EM 1110-2-1614, June 30, 1995).
- Design Guidance on Levees (Publication ETL 1110-2-555, November 30, 1997).
- Conduits, Culverts, and Pipes (Publication EM 1110-2-2902, March 31, 1998).
- Guidelines on Ground Improvement for Structures and Facilities (Publication ETL 1110-1-185, February 1, 1999).
- Engineering and Design for Civil Works Projects (Publication ER 1110-2-1150, August 31, 1999).
- Design and Construction of Levees (Publication EM 1110-2-1913, April 30, 2000).
- Geotechnical Investigations (Publication EM 1110-1-1804, January 1, 2001).
- USACE CESPK Levee Task Force, Recommendations for Seepage Design Criteria, Evaluation and Design Practices (2003a).
- Slope Stability (Publication EM 1110-2-1902, October 31, 2003).
- Geotechnical Levee Practice (Publication SOP EDG-03, June 28, 2004).
- Engineering and Design—Design Guidance for Levee Underseepage (Publication ETL 1110-2-569, May 1, 2005(a)).
- Quality Management (Publication ER 1110-1-12, September 30, 2006).
- ETL 1110-2-571 Guidelines For Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures (April 10, 2009(a)).

Sacramento River Flood Control Project Levee Height Requirements

As specified in the Design Memorandum, Volume I of II for the Sacramento River Flood Control Project, California, Mid-Valley Area, Phase III (U.S. Army Corps of Engineers 1996:2-12), the following minimum levee height (freeboard) requirements apply to the various reaches of the proposed project area[1].

[1] The freeboard requirements listed are for the SRFCP, specifically the "1957 USACE design" profiles for Sacramento River and many of its tributaries.

- Feather River Levee Upstream of Confluence with Sutter Bypass: 3 feet.

State

The following state policies related to ~~flood control~~flood risk management and geomorphic conditions may apply to implementation of the proposed project. Additional state policies potentially relevant to the implementation of the project can be found in Appendix A.

Central Valley Flood Protection Plan

According to California Government Code Sections 65302.9 and 65860.1, every jurisdiction located within the Sacramento–San Joaquin Valley is required to update its general plan and zoning ordinance in a manner consistent with the CVFPP within 24 months after the CVFPP's adoption[2], which occurred on June 29, 2012. In addition, the locations of the state and local flood management facilities, locations of flood hazard zones, and the properties located in these areas must be mapped and consistent with the CVFPP.

The proposed project is intended to be consistent with the CVFPP, as the state seeks to continue to work with SBFCA to develop and implement projects to achieve an urban level of ~~flood protection~~performance for Yuba City and other population centers in the affected area. This includes reconstructing and/or improving levees to urban design criteria (see below) along the west bank of the Feather River, adjacent to and upstream from Yuba City, as part of the FRWLP.

Department of Water Resources Urban Levee Design Criteria

Pursuant to SB 5 (Government Code (GC) §65007(l)), the Urban Levee Design Criteria (ULDC) define the urban level of performance~~flood protection~~ as the level of protection that is necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year using criteria consistent with, or developed by, DWR. While cities and counties located outside of the Sacramento–San Joaquin Valley are not required to make findings related to the urban level of ~~flood protection~~performance, the ULDC can help inform engineering and local land use decisions for areas at risk of flooding anywhere in California. The ULDC was developed through a collaborative process with stakeholders from local government (including representatives from the Central Valley, San Francisco Bay Area, and Los Angeles Region), state government, and the Federal government.

The ULDC provide criteria and guidance for design, construction, operation, and maintenance of levees and floodwalls in urban and urbanizing areas. When finalized, the ULDC will supersede the Interim Levee Design Criteria for Urban and Urbanizing Areas in the Sacramento–San Joaquin Valley (Version 4), dated December 15, 2010. The ULDC contain numerous revisions and refinements from Version 4.

Local

Butte County, Sutter County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley each have adopted goals and policies related to ~~flood control~~flood risk management, detailed in Appendix A.

[2] The Public Draft of the CVFPP was completed in December 2011.

3.1.2.2 Environmental Setting

The following considerations are relevant to ~~flood control~~flood risk management and geomorphic conditions in the proposed project area. The proposed project area is the Feather River and approximately 39 miles of its west bank extending from the Thermalito Afterbay south to a few miles above the Sutter Bypass.

~~Flood Control~~Flood Risk Management

Sacramento River Flood Control Project

The SRFCP was authorized by Congress in 1917. The SRFCP was the major project for ~~flood control~~flood risk management on the Sacramento River and its tributaries. It was sponsored by The Reclamation Board of the State of California (today reauthorized as the CVFPB) and was the first Federal ~~flood control~~flood risk management project constructed outside the Mississippi River Valley (U.S. Army Corps of Engineers 2009b).

The SRFCP includes approximately 980 miles of levees, overflow weirs, pumping plants, and bypass channels that protect communities and agricultural lands in the Sacramento Valley and the Delta. Currently, the SRFCP extends from the Sacramento River's mouth near Collinsville in the Delta to near Chico Landing in the northern Sacramento Valley. Approximately 980 miles of levees were constructed as part of the project, reducing flood risk ~~providing flood protection~~ to roughly 800,000 acres of highly productive agricultural lands, the cities of Sacramento and Marysville, and numerous other small communities. Although the SRFCP levees often were constructed of poor foundation materials such as river dredge spoils that would not meet current engineering standards, the levees are relied upon to reduce flood risk~~provide flood protection~~ during major storms for~~to~~ more than 2 million people in approximately 50 communities with an estimated $37 billion in urban and agricultural development.

Sacramento River Bank Protection Project (SRBPP)

The SRBPP is a continuing long-term project authorized by Section 203 of the Flood Control Act of 1960 (Public Law 86-645). The SRBPP was authorized to provide protection to the existing levee and ~~flood control~~flood risk management facilities of the SRFCP.

The SRBPP has been divided into three phases. Phase I bank protection was completed in 1975 and resulted in 435,953 feet of bank protection. Current bank protection is being carried out under Phase II. The work authorized through Section 3031 of the WRDA of 2007 is a continuation of Phase II bank protection, and increases the amount of currently authorized bank protection by 80,000 linear feet. Phase III is future work that will be formulated in a general reevaluation of SRFCP. As construction of the Phase II supplemental authority is completed, implementation of Phase III will be critical to ensuring the Sacramento River levees that are seriously threatened by erosion will receive corrective measures to prevent levee failure, catastrophic damage, and possible loss of life. Planning for Phase III is expected to conclude in 2013.

Watercourse Description and Ownership

Plate 1-1 shows the location of the SRFCP levees and the locations of the watercourse features in the proposed project area.

After the Feather River flows through the Oroville Dam it enters the town of Oroville and continues south, is joined by the Yuba River at Marysville and Yuba City, and eventually joins the Sacramento River. Its confluence with the Sutter Bypass is located about 3 miles downriver from the rural community of Nicolaus, at (Feather River) RM 7. The Feather River levees in the project area are operated and maintained by DWR (MAs 3, 7, and 16) and Sutter/Butte County Levee Districts 1 and 9.

Flooding

The planning area is within the Sutter-Butte basin. The basin is generally bounded by the Sutter Bypass to the west and south, the Feather River to the east and south, and the Thermalito Afterbay to the north. Additional background on the flood basins in the Sacramento Valley can be found in Appendix C.

Past and Present Flood Concerns

Flooding was historically and still is a concern in planning area. Historical floods occurred on the Feather and Yuba Rivers in the early 1800s, 1825–26, 1849–50, 1852–53, 1861–62, 1867, 1875, 1881, 1890, and 1907. Floods later were recorded in 1909, 1914, 1937, 1940, 1955, 1964, and 1970. Floods of record occurred in December 1937, December 1955, December 1964, February 1986, January 1995, and January 1997, ranging from 20-year to more than 100-year storms, and caused hundreds of thousands of dollars of damage (Butte County 2007:81).

However, major flood improvements have been made since flooding in these areas has been documented. Therefore, flood events since the construction of Oroville Dam (1968) and New Bullards Bar Dam (1971) are of most relevance to describing the current flood risk in the planning area.

The planning area is susceptible to four types of floods: levee failure/overtopping, localized flooding, riverine (slow rise) flooding, and dam failure inundation. These types of floods are described below.

Levees and ~~Flood Protection~~Level of Performance

Major storm events can produce high flows throughout the Feather River system. The primary method of flood risk reduction~~protection~~ in the planning area is by a system of levees or earthen embankments along the Feather River, combined with flood storage at the Oroville Dam and the New Bullards Bar Dam, that contain high river flows within these constructed channels[3]. There are approximately 41 miles of levees protecting the planning area lands from flooding. These levees provide the planning area with protection against flooding from the Feather, Yuba, and Bear Rivers[4]. All levees on the Feather River within the proposed project area are part of the SRFCP that was constructed by the USACE and some are now owned and maintained by the State of California, specifically DWR, while others are maintained by local levee districts.

Recent and ongoing studies have found that some levees in the proposed project area do not meet, or have not been certified as meeting, the current levee design criteria (especially for the 200-year

[3] The planning area also has a few drainage facilities with pump stations that keep the interior from flooding in certain locations.

[4] The Yuba and Bear Rivers' levees are not within the proposed project area; however, the contribution of flows from these rivers directly affects the channel capacity of the Feather River and thus the integrity and stability of the Feather River West Levee in the proposed project area.

storm events). As a result, much of the planning area is considered vulnerable to flooding from levee failure. Plate 3.1-1 shows the maximum amount of inundation that could occur if a proposed project area levee were to fail or overtop in the proposed project area. As shown on Plate 3.1-1 inundation amounts in the proposed planning area are unknown north of the Sutter Buttes and are greater than 3 feet (ranging up to a maximum of 25 feet) below the Sutter Buttes.

As described in Section 5.5, *Flood Hazards*, of the 2008 Sutter County General Plan Update Technical Background Report (TBR) (Sutter County 2008:5.5-2 through 5.5-3), a number of studies have been completed or are in progress whose recommendations may possibly affect ~~flood protection~~flood risk and FEMA flood mapping within the county. These include the Lower Feather River Floodplain Mapping Study, Upper Feather River Floodplain Mapping Study, Natomas Basin Project, Sutter County Feasibility Study, and the DWR Levee Evaluation Program.

The current delineated FEMA flood zones are shown in Plate 2-20 and are described below.

Localized Flooding

Localized flooding problems often are caused by storm drain system overload, severe weather, or an unusually heavy amount of rainfall. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with urbanization and development as well as inadequate storm drainage systems. The term *flash flood* describes localized floods of great magnitude and short duration. In contrast to riverine flooding, this type of flooding usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort typically occurs in the winter and spring. However, much of the land in the planning area is agricultural in nature; as such, localized flooding does not present as significant a hazard as riverine flooding and is not a significant concern (AMEC 2007:44–45).

Riverine Flooding

Riverine flooding, defined as when a watercourse exceeds its bankfull capacity (i.e., overbank flow), generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flooding occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface as a result of urbanization (AMEC 2007:45).

In the planning area, slow-rise riverine flooding occurs predominantly from heavy and continued rains, sometimes combined with snowmelt, increased outflows from upstream dams, and heavy streamflow from tributary streams. These intense storm events can overwhelm the local waterways in the planning area as well as the integrity of the levee system. Slow-rise flooding is a well-established and potentially large-scale threat to the planning area (AMEC 2007:45).

Dam Failure Inundation

In addition to levee failure or overtopping of the levees, there is a potential for flooding as a result of a dam failure. There are 10 large dams listed in the 2008 Sutter County General Plan Update TBR (Sutter County 2008:5.5-4), all under the jurisdiction of DWR's Division of Safety of Dams (DSOD), that have the potential to cause significant flooding in the planning area if any were to fail. These

dams are operated by various entities for several purposes, including ~~flood control~~flood risk management, water supply, fisheries, and other beneficial uses.

There have been no dam failures within or affecting the planning area to date. With regard to the likelihood of future occurrences, all area dams have performed well during past floods, but the planning area remains at risk of dam failures from numerous dams under a variety of ownership and control and of varying ages and condition. As a result, the potential exists for future dam failures to occur that could adversely affect public safety and property in the planning area (AMEC 2007:44–45). Plate 3.1-2 shows the general inundation areas for specific dams in Butte and Sutter Counties. In Butte County (on the left side of the figure), the failures of either the Lake Almanor Dam (located on the North Fork of the Feather River in the Almanor Basin) or the Lake Oroville Dam would lead to catastrophic flooding in the planning area. In Sutter County (on the right side of the figure), failure of these same dams, as well as failure of the Thermalito Afterbay Dam, would affect the planning area. Note that Plate 3.1-2 has two separate legends side by side.

Federal Emergency Management Agency Mapping Efforts

Based on the FEMA FIRMs, the locations of the designated floodplains in the planning area are shown on Plate 2-20[5], and are summarized below.

- Most of the northern portion of the planning area, especially the interior section, is designated as (Unshaded) Zone X (outside the 0.2% annual chance floodplain) and (Shaded) Zone X (areas of 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than one foot or within drainage areas less than one square mile; and areas protected by levees from 1% annual chance flood).
- The remainder of the planning area (the northern fringes associated with the Cherokee Canal and the Feather River) is designated as either Zone A (inundated by 100-year flooding; base flood elevations [BFEs] have not been determined), or is currently being revised with up-to-date FIRM mapping (i.e., the central portion of the planning area).

Plate 2-20 implies that large portions of the planning area are not susceptible to 100-year flooding; nonetheless, as described below, many of these levee segments are vulnerable to a range of conditions that currently make them susceptible to weakness and/or failure.

It should be noted that FEMA is updating and modernizing existing FIRMs for most of the United States, including California. Accordingly, and given known levee deficiencies, FIRM data for Colusa, Glenn, Yolo, and Yuba Counties (last revised in 1996) may not be entirely indicative of the present status of designated floodplains in the planning area. Butte County's FIRM data is from 2011 and is considered up-to-date.

Channel Capacity, Levee Dimensions, and Site-Specific Flood and Discharge Information

Common Flood Frequency Terminology

Synthetic flood events typically are developed with a 50%, 10%, 4%, 2%, 1%, 0.5%, and 0.2% chance of occurring in any given year. Because there are numerous ways to describe the statistical frequency of a flood event, Table 3.1-1 provides a reference of equivalent terminology. For a typical 30-year mortgage, with a 1 in 30 chance that a specific flood event will occur in any given year, the

[5] Plate 2-20 is derived from a compilation of parcels that encompass the proposed project area.

probability that a flood of this magnitude will occur (or be exceeded) in any given year would be 3% and the period of time between flood events of this magnitude would be 30 years.

Table 3.1-1. Common Flood Frequency Terminology

Chance of Occurring in Any Given Year—The chance that a specific flood event will occur in any given year	**Probability of Exceedance**—The probability that a flood of this magnitude will occur (or be exceeded) in any given year, commonly expressed as a percentage	**Average Return Frequency, Years**—The period of time between flood events of this magnitude, averaged over many thousands of years, expressed in years
1 in 2	50%	2
1 in 10	10%	10
1 in 25	4%	25
1 in 50	2%	50
1 in 100	1%	100
1 in 200	0.5%	200
1 in 500	0.2%	500

Feather River

Flooding in the Feather River has been attributed to several sources: the upstream forks of the Feather River, Dry Creek and its tributaries, stormwater drainage in the local cities, Wyman Ravine, and other tributaries. Additionally, as in any watershed, increased encroachment on floodplains, as well as increased impervious surfaces and localized drainage problems, could have a cumulative effect that would exacerbate the potential for flooding and overwhelm the existing ~~flood control~~flood risk management regime of the river (Wood Rodgers 2006).

DWR has estimated the channel capacity of the Feather River from Oroville to its confluence with the Yuba River to be 210,000 cfs; 300,000 cfs from the confluence with the Yuba River to the Bear River; and 320,000 cfs from the confluence with the Bear River to the Yolo Bypass (California Department of Water Resources 2010: 3–6; U.S. Army Corps of Engineers 2002b:20).

Because of channel limitations of the Feather River near the Yuba River and below the Bear River, the maximum allowed release criterion for Oroville Dam is 160,000 cfs. Oroville Dam flood operations are defined by the release schedule provided in the operations manual (U.S. Army Corps of Engineers 1970). Operations are not to exceed the forecast flow upstream and downstream of the Yuba River. Structurally, the release gates can allow controlled releases of up to 250,000 cfs. Emergency spillway design capacity of Oroville Dam would allow up to an additional 629,000 cfs of uncontrolled release (City of Biggs 1998:6-5 through 6-6).

DWR has estimated that a 200-year storm event would require releases of 170,000 cfs from Oroville Dam and that a 500-year storm event would require releases of 250,000 cfs. In the event that conditions require unusually high release rates (in excess of 150,000 cfs) DWR would notify local jurisdictions and emergency response agencies. Additionally, flows would be increased incrementally to allow evacuation if determined necessary (City of Biggs 1998:6-5 through 6-6).

The Feather River can generate more than 300,000 cfs during large flood events. Unlike much of the Sacramento River, the levees along the Feather River are set back from the channel, forming wide floodways. Several rural residential communities are located in low-lying basins (on the landside of

the levees) that can experience flood depths up to 20 feet in the event of a levee failure. Prior to construction of the flood management system, the Feather River historically overflowed toward the west during major flood events, mingling with floodflows in the Butte and Sutter basins (U.S. Army Corps of Engineers 2002a:95–96).

Water Surface Elevations

The Hydraulic Engineering Center River Analysis System (HEC-RAS) model developed by the USACE for the Feather River and its tributaries as part of the USACE Common Features (USACE Model) was used as the base model for the hydraulic analysis conducted by Peterson Brustad Inc. (PBI [PBI Model]) for the Feasibility Study and SBFCA special benefit assessment district. Since its development in 2005, the model has been updated independently by the USACE and MBK Engineers (MBK Model). The MBK Model was developed to support the levee improvement projects that were constructed as part of the TRLIA. In support of the Feasibility Study, SBFCA retained PBI to develop an updated model for the Feather River and the Sutter Bypass using the USACE model as the base and incorporating certain features from the MBK Engineers model (Peterson Brustad 2010:7).

The PBI Model water surface elevation (WSE) profiles were developed to compare the 100-year and 200-year WSE profiles to the "1957 USACE design" profile and top of levee profile (Peterson Brustad 2012a, 2012b). The design WSE's were independently reviewed by MBK Engineers consistent with USACE independent technical review (ITR) standards. As Plates 3.1-3 and 3.1-4 show, the existing Feather River West Levee has sufficient freeboard for 100-year and 200-year events, which for the most part are lower than the 1957 USACE design profile. In addition, the PBI 'With-Project' analysis (Peterson Brustad 2012d) demonstrates that the Feather River West Levee Project results in no material impacts to the existing river channel hydraulics.

Flow Frequency

Mean annual flow calculations for locations along the Feather River are presented in Table 3.1-2. As shown in this table, the mean annual flow in the vicinity of the Feather River's confluence with the Bear River is 15,202 cfs.

Table 3.1-2. Mean Annual Flow Calculations for the Feather River, Oroville to Confluence with Sutter Bypass and Sacramento River

USGS Station #	USGS Station Name	Drainage Area	Mean Annual Flow (cfs)	Basis (WY–WY)
11407000	Feather River at Oroville	3,624	1,090	1969–2004
11406920	Thermalito Afterbay release to Feather River	–	3,769	1968–2004
	Feather River above Yuba City sub-total		4,859	
11407150	Feather River at Gridley	3,676	12,418	1964–1998
11421000	Yuba River near Marysville	1,339	2,376	1970–2004
	Feather River below Yuba City sub-total		14,794	
11424000	Bear River near Wheatland	292	408	1966–2004
	Feather River below Bear River sub-total		15,202	

Source: U.S. Geological Survey 2005.
USGS = U.S. Geological Survey; cfs = cubic feet per second; WY = water year.

Levee Materials and Dimensions (West Bank Only)

The levees on the lower Feather River area were constructed from a wide variety of soil types, including sand, silty sand, sandy silt, silt, and clay. Most of the levees have at least some sand or silty sand in the embankment. The levees on the upper Feather River area were constructed on mining debris or dredge tailings of varying thickness, deposited over semi-consolidated Modesto or Riverbank formation sediments. Multiple hardpans appear to be present beneath the levees, associated with periods of non-deposition. Hardpans have been incised or removed during flood events and alluvial processes at some locations. See Section 3.3, *Geology, Soils, Seismicity, and Mineral Resources*, for additional information on levee materials and subsurface conditions.

The average levee crest width on the west bank levees is approximately 24 feet, with a minimum of 12 feet and a maximum of 40 feet. The landside slope ratio ranges from 2:1 to 4:1, with most landside ratio slopes being 3:1. The waterside slope ratio ranges from 3:1 to 4:1, with most waterside ratio slopes being 4:1.

Levee heights on the lowest 5 miles of the Feather River West Levee vary from 15 to 20 feet above ground. Upstream of this to just north of Yuba City, levee heights vary from 18 to 27 feet with a typical height of 20 feet above ground. Above this point on the upper Feather River, levee heights above ground are variable.

Other Available Information

For additional information about the Feather River and its floodplain, refer to the Upper Feather River Floodplain Mapping Study (U.S. Army Corps of Engineers 2008) and the Lower Feather River Floodplain Mapping Study (U.S. Army Corps of Engineers 2005b). DWR commissioned USACE to prepare a floodplain mapping study along the upper and lower sections of the Feather River. The upper study extends from the mouth of the Yuba River upstream to Oroville Dam, approximately 44 miles in length. The study delineates the 100-, 200-, and 500-year floodplains along the Feather River between the Yuba River and Oroville Dam. The lower study addresses flooding from the Feather River downstream from the Yuba River confluence to the mouth of the Feather River at the Sacramento River. It also addresses flooding from the Bear River downstream of SR 65 and several tributaries to the Bear River.

Levee Deficiency Evaluation

In 2009, SBFCA retained Kleinfelder, Inc. to prepare a problem identification analysis for the 24 miles of the Feather River West Levee from the Thermalito Afterbay to north Yuba City. Using geotechnical data collected and developed under the auspices of DWR's Urban Levee Evaluation program, Kleinfelder analyzed the existing levee at select locations (Kleinfelder 2009). The primary focus of Kleinfelder's effort was to identify locations where the levee did not meet current DWR standards for through-seepage, under-seepage, and levee slope stability (Peterson Brustad 2010:12). For a discussion of levee deficiencies outside of the Kleinfelder 2009 assessment area, refer to the *Potential Levee Failure Mechanisms* section below.

Through-Seepage

The likelihood of through-seepage exiting the landside slope of the levee is dependent on such factors as levee embankment composition, geometry (levee width and landside slope angle), and duration of flood stage. Through-seepage is a concern for two reasons. First, through-seepage affects slope stability because the higher water level on the levee embankment reduces effective stress and

therefore reduces the shear strength of levee and foundation materials. The reduction in strength attributable to higher water level occurs in all types of soil. Secondly, through-seepage can cause erosion (specifically what is referred to as *piping*) of the levee embankment (Peterson Brustad 2010:12).

The risk of internal erosion or piping is greatest for non-plastic soils such as silt and sand. Clayey soils tend to be comparatively resistant to internal erosion and piping. Through-seepage in clayey levee embankments may contribute to shallow slope instability. These shallow slopes are typically not a threat to levee integrity and are most often attributed to desiccation and cracking of the levee shell and subsequent saturation by rainfall (Peterson Brustad 2010:12).

Kleinfelder found that levee through-seepage is possible along the Feather River West Levee during periods of high river stage. They also found that the Feather River West Levee was constructed from a wide variety of materials and most of the levee embankment includes at least some non-plastic soil that is susceptible to internal erosion and piping. Mitigation measure alternatives identified by Kleinfelder for addressing through-seepage included seepage slurry cutoff walls, drained stability berms, and flattening the landside levee slope (Peterson Brustad 2010:12).

Under-Seepage

Kleinfelder also analyzed the levees for the potential of under-seepage. Levee under-seepage is a concern because it creates the potential for two modes of levee failure: (1) blowout/erosion at the landside toe because of excess seepage pressure (exit gradient), and (2) increased seepage pressures decreasing the landside slope stability. In their analysis, Kleinfelder used an exit gradient of less than 0.5 at the landside levee toe for the 1957 USACE design WSE, 100-year WSE, and 200-year WSE as the exit gradient acceptance criterion. For the 200-year plus 3 feet WSE, an exit gradient less than 0.6 at the landside levee toe was the exit gradient acceptance criterion used (Peterson Brustad 2010:12–13).

The under-seepage analyses performed by Kleinfelder at selected locations along the levee generally resulted in exit gradients exceeding the design criteria for the 100-year, 200-year, and 1957 WSE at the landside toe. Mitigation measure alternatives identified by Kleinfelder for addressing under-seepage included seepage slurry cutoff walls, seepage berms, and seepage relief trenches (Peterson Brustad 2010:12–13).

Slope Stability

Kleinfelder also found that the Feather River West Levee could potentially be subject to several types of slope failure.

- Shallow sloughing of the landside slope surface that does not extend to the levee crown.
- Wedge-type slip surfaces that intersect the levee crown.
- Circular-type slip surfaces that intersect the levee crown.

Shallow sloughing that does not extend to the levee crown is generally considered a maintenance issue and not a risk to levee integrity; therefore Kleinfelder did not evaluate these types of slope failures. Wedge-type failures can occur along planes of weakness within the levee and/or the underlying foundation soils. Kleinfelder did not perform any wedge-type slope stability analyses. Kleinfelder recommended that as additional geotechnical information becomes available during any

future project design phases, it should be evaluated for conditions that may warrant wedge-type slope stability analyses (Peterson Brustad 2010:13).

Kleinfelder analyzed circular-type failures that intersect the levee crown. Kleinfelder used a slope stability factor of safety of greater than 1.4 for the 1957 USACE design WSE, 100-year WSE, and 200-year WSE as the slope stability acceptance criterion. For the 200-year plus 3 feet WSE, a slope stability factor of safety of greater than 1.3 was the acceptance criterion used. In locations where slope stability factors of safety were not met, Kleinfelder identified landside stability berms and flattening the landside levee slope as potential mitigation measures (Peterson Brustad 2010:13).

Summary

Kleinfelder's problem identification analysis determined that almost the entire Feather River West Levee from Thermalito to north Yuba City requires some level of levee rehabilitation. In addition, Levee District 1 has determined that the levee from north Yuba City to Star Bend requires similar levee rehabilitation (Peterson Brustad 2010:13).

Emergency Levee Repair Program Sites

According to DWR's database of Emergency Levee Repair Program Sites (California Department of Water Resources 2007), approximately three emergency levee repairs occurred in 2005 and 2006 on the Feather River; however, these occurred outside of the proposed project area on the east bank of the river and are not discussed herein. Approximately two emergency levee repairs occurred in 2005 and 2006 on the Sutter Bypass. Site identification number 20051230-008-001 occurred on the west bank of levee mile (LM) 18.5 of the Sutter Bypass to address bank erosion concerns; its total length of repair was approximately 400 feet, the repairs consisted of relief wells and lining the canal. RD 1500 was the lead agency. Site identification number 20051230-019-001 occurred on the west bank of LM 0.55 of the Sutter Bypass to address bank erosion concerns; its total length of repair was approximately 150 feet, the repairs consisted of rock slope protection RD 70 was the lead agency.

Refer to <http://www.water.ca.gov/levees/projects/> for additional information.

Sacramento River Bank Protection Project Annual Erosion Sites Survey

Under the SRBPP, the USACE conducts annual surveys to identify erosion sites. Each year, personnel from the USACE, Sacramento District, and their local sponsor, DWR, conduct a field reconnaissance review of the Sacramento River ~~flood control~~flood risk management system. The primary purposes of the review are to: (a) monitor and document the condition of previously identified erosion sites, (b) inventory any new erosion sites, and (c) identify critical erosion sites that appear to be an imminent threat to the structural integrity of the ~~flood control~~flood risk management system.

Specific criteria are used to identify erosion sites within the system. In most cases the criteria are consistent from year to year and are based on bank and levee conditions that are threatening the function of the ~~flood control~~flood risk management system. An erosion site is defined as follows.

> A site that is at risk of an erosional failure during floods and/or normal flow conditions; the term "critical" is used to indicate erosion sites that are an imminent threat to the integrity of the flood control system and of the highest priority for repair.

The project team field identifies erosion sites as being critical based on familiarity with the system and experience with levee failures by the erosion process.

As of 2009, there are nine identified erosion sites on the Feather River (Plate 3.1-5). None of the identified erosion sites were identified as critical[6] (Ayres Associates 2010:9-10).

Potential Levee Failure Mechanisms

Reconstructed levee performance issues and corrective actions are described in detail on pages 2-24 through 2-26 and pages 2-41 through 2-42 of the November URS (2008a) report. In brief, under-seepage, through-seepage, and erosion issues all have been documented at various locations on the Feather River.

For additional information about present and historical levee performance, refer to the URS (2008a) and pages 2-6 through 2-12 of the March URS (2008b) report.

More recent synthesis of the surficial mapping and geotechnical data indicates that subsurface stratigraphy in the Sutter Bypass area locally may be conducive to levee under-seepage. In the lower Feather River, lateral and vertical variability in the shallow subsurface deposits has resulted from past geomorphic processes. The conceptual subsurface stratigraphic framework suggests that stratigraphic relationships may promote localized levee under-seepage, given certain hydraulic conditions, particularly along the lowest reaches (Appendix O of Volume 4 of URS 2010:9; Appendix O of Volume 5 of URS 2010:9 [included in this report as Appendix C]).

In brief, significant portions of the levees on the Feather River do not meet project criteria for steady state stability at the 200-year WSE because of under-seepage, through-seepage, the presence of a soft layer above the hardpan, or a combination thereof (URS 2008b:ES-2 through ES-3).

Geomorphic Conditions

General Geomorphic Setting

The Sacramento Valley is the northern portion of the Great Central Valley of California. The river basin is an elongated synclinal trough, bounded by the Sierra Nevada plutonic complex to the east and the Coast Ranges to the west. The Sacramento Valley is underlain by marine sedimentary rocks overlain by recent alluvial deposits and, to a lesser extent, some volcanic rocks. The levees and river sediments associated with the planning area are composed of Quaternary alluvium deposits that consist of loose to medium-dense, unweathered gravel, sand, silt, and clay. These sediments are estimated to have been deposited 200 to 10,000 years before present in naturally formed riverbanks and floodplains along the Feather River (Helley and Harwood 1985).

In geologic history, the Sacramento and Feather Rivers migrated frequently and freely within their meander belts, which typically exceeded several thousand feet in width (Buer 1984 as cited in North State Resources and Stillwater Sciences 2009:3-134). Prior to Euroamerican settlement, the mainstem Sacramento and Feather Rivers and tributaries along the valley floor would naturally overtop their banks at regular cycles and flood the adjacent lands, replenishing and depositing sediments. Despite overbank sediment deposition, these flood basins have maintained a low topographic profile, which, as mentioned previously, suggests that the flood basins are subsiding at a rate equal to or greater than overbank deposition (Gilbert 1917; Water Engineering & Technology 1990a:34; Water Engineering & Technology 1989 as cited in Water Engineering & Technology 1990a:34; Harvey 1988 as cited in Water Engineering & Technology 1990a:34). These floodplains

[6] Although a site may not be listed in the survey, it does not mean that there are no concerns with that site's levee stability.

historically have provided crucial fluvial geomorphic roles for the Sacramento and Feather Rivers, as the flow loss to the flood basins causes the Sacramento and Feather Rivers to downsize in the downstream direction in the lower reaches (Water Engineering & Technology 1990a:35).

Beginning in the late 1800s, the Sacramento and Feather Rivers' channel morphology and sediment transport regime have been progressively altered by human activities, including upstream hydraulic mining and the clearing of riparian vegetation and the construction of levees and upstream dams for ~~flood control~~flood risk management and water supply. Bank armoring of the levees has resulted in lower sinuosity, fewer overbank flows, and an altered pattern of channel migration and meander cutoff (Brice 1977 as cited in North State Resources and Stillwater Sciences 2009:3-134; Larsen et al. 1997, 2004 as cited in North State Resources and Stillwater Sciences 2009:3-134; Larsen and Greco 2002 as cited in North State Resources and Stillwater Sciences 2009:3-134).

The geomorphic history of the Feather River has been substantially affected by hydraulic mining over the last century[7]. Prior to the onset of mining, the river was similar to the Sacramento River upstream of Colusa. The rapid introduction of mining debris resulted in extensive shoaling of bendways and a reduction in channel sinuosity. The initial pulse or surge of mining sediment was very fine-grained, silt-dominated material (referred to as *slickens*), which was followed by quartz-dominated sands and gravels. Channel infilling from mining debris resulted in a dramatic decrease in channel capacity on the Feather River. Extensive flooding and overbank deposition onto urban areas and agricultural lands in the planning area resulted. The Feather River subsequently has degraded into these sediments so that hydraulic mining debris presently constitutes the channel banks. The fine-grained slickens form a continuous, cohesive bank toe along the entire proposed project area up to RM 28. This erosion-resistant toe generally has resulted in a stable river planform.

If degradation continues, however, coarse-grained, non-cohesive pre-mining sediments will be exposed. As a result, channel stability may decrease. Upstream of Marysville, the Feather River is significantly different from the lower Feather River in that it did not receive the tremendous sediment influx introduced by hydraulic and dredge mining. Although hydraulic mining did occur on the upper Feather River, the amount of material introduced was significantly less than that on the Yuba River (Water Engineering & Technology 1990a: xix, 1991:137–139).

See Section 3.3, *Geology, Soils, Seismicity, and Mineral Resources*, for a description of sedimentology in the proposed project area. Additional background on channel network classification, reach specific geomorphic conditions, surficial geology, channel incision, and sinuosity, channel migration, bank failures can be found in Appendix C.

3.1.3 Environmental Consequences

This section describes the environmental consequences relating to ~~flood control~~flood risk management and geomorphic conditions for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect

[7] It is estimated that between 1848 and 1909, nearly 44% of the total of some 1,555,000,000 cubic yards of gold-bearing material mined by the hydraulic method was washed into the Yuba River (Hagwood 1981 as cited in Water Engineering & Technology 1990a:22). In addition to this 685 million cubic yards of material that entered the Yuba River, 100 million cubic yards of sediment were washed into the upper Feather River and 255 million cubic yards entered the Bear River. Consequently, the Feather River in the proposed project area has been affected by mining debris from all three sources, with the greatest effects from the influx of sediment from the Yuba River (Water Engineering & Technology 1990a:22).

would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.1.3.1 Assessment Methods

This evaluation of ~~flood control~~flood risk management and geomorphic conditions is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the proposed project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

Assessment of environmental consequences associated with ~~flood control~~flood risk management and geomorphology has also been accomplished through the following means.

- An evaluation of existing conditions of proposed project area levees and projected bank erosion rate estimates.
- Qualitative assessments of sedimentation/scour potential based on existing Federal and state channel hydraulic design standards and guidelines.

3.1.3.2 Determination of Effects

For this analysis, an effect pertaining to ~~flood control~~flood risk management and geomorphic conditions was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 California Code of Regulations [CCR] 15000 et seq.), and standards of professional practice.

Effects on hydrologic or geomorphic conditions may be considered significant if implementation of an alternative would result in any of the following conditions.

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site.
- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.
- Place within a 100-year flood hazard area structures that would impede or redirect floodflows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Effects on ~~flood control~~flood risk management may be considered significant if implementation of an alternative would result in the following conditions.

- Significantly raise flood stage elevations.
- Increase the frequency and duration of inundation of lands.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee.

An effect on the levee system is considered significant if an alternative would substantially increase any of the following.

- Seepage.
- Levee settlement.
- Wind erosion.
- Bank erosion or bed scour.
- Sediment deposition.
- Subsidence of land adjacent to levees.

In addition, an effect on the levee system is considered significant if an alternative would substantially decrease any of the following.

- Levee stability.
- Inspection, maintenance, or repair capabilities.
- Current level of levee slope protection.
- Emergency response capabilities.
- Channel conveyance capacity.
- The ability of the levees to withstand seismic forces.

3.1.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning ~~flood control~~flood risk management and geomorphic conditions are summarized in Table 3.1-3.

Table 3.1-3. Summary of Effects for ~~Flood Control~~Flood Risk Management and Geomorphic Conditions

Effect	Finding	Mitigation Measure	With Mitigation
Alternative 1			
Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design	No effect	None required	No effect
Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design	No effect	None required	No effect
Effect FC-3: Decrease in Through- and Under-Seepage	Beneficial	None required	Beneficial
Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage	Beneficial	None required	Beneficial
Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition	No effect	None required	No effect
Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area	Significant	FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design	No effect
Effect FC-7: Increase in Levee Slope Stability	No effect	None required	No effect

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 2 and 3			
Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design	No effect	None required	No effect
Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design	No effect	None required	No effect
Effect FC-3: Decrease in Through- and Under-Seepage	Beneficial	None required	Beneficial
Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage	Beneficial	None required	Beneficial
Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition	No effect	None required	No effect
Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area	Significant	FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design	No effect
Effect FC-7: Increase in Levee Slope Stability	Beneficial	None required	Beneficial

3.1.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions.

However, without levee improvements, there is the continued risk of levee failure. Under-seepage and loss of levee foundation soils would be expected to continue. A catastrophic levee failure would result in collapse of levee slopes and loss of soil. Furthermore, if a levee breach were to occur, emergency construction and repair activities would be implemented without the use of best management practices and could result in loss of channel capacity (and henceforth a decrease in the existing ~~flood protection~~level of performance conditions) and alteration of present-day geomorphic processes.

Refer to Section 2.6.2.2, *Consequences of Levee Failure*, for additional information.

3.1.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on ~~flood control~~flood risk management and geomorphic conditions. These potential effects and related mitigation measure requirements are summarized in Table 3.1-4 and discussed below.

Table 3.1-4. ~~Flood Control~~Flood Risk Management and Geomorphic Conditions Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design	No effect	None required	No effect
Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design	No effect	None required	No effect
Effect FC-3: Decrease in Through- and Under-Seepage	Beneficial	None required	Beneficial
Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage	Beneficial	None required	Beneficial
Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition	No effect	None required	No effect
Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area	Significant	FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design	No effect
Effect FC-7: Increase in Levee Slope Stability	Beneficial	None required	Beneficial

Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design

No adverse local, upstream, or downstream ~~flood control~~flood risk management–related effects are associated with the various proposed seepage control and erosion treatments, as these treatments would help minimize flooding locally behind the improved levee and enable it to meet associated regulatory criteria.

Local, upstream, or downstream water levels would not be affected by the various proposed seepage control and erosion treatments, as these treatments would not affect the height of the existing levees.

These treatments would not significantly change the geometry of the Feather River and therefore would not cause significant changes to water flow in the river or cause negative hydraulic effects upstream or downstream of the project reach. The various proposed seepage control and erosion treatments would not expose people or structures to a significant risk of flooding. Rather, this risk would be alleviated because these treatments would reduce the risk of levee failure for the 100- and 200-year floods. Because these treatments would upgrade existing levees using up-to-date design and construction standards, their implementation would reduce the risk of flooding for the planning area.

Furthermore, these improvements would be consistent with the principles that have guided the management of the SRFCP over the past century and with the policies adopted by the state legislature calling for an immediate and comprehensive effort to increase the level of ~~flood protection~~performance provided to the region in the SRFCP area. Finally, the CVFPB resolution adopting the CVFPP (Resolution No. 2012-25) states that "… the Board has consistently found that

no adverse hydraulic impacts are associated with levee strengthening projects that do not change the alignment or height of the levee, or the cross section of the channel and overflow area."

Alternative 1 would therefore have no effect related to changes in water surface elevations and ~~flood safety~~risk to health and safety. Mitigation is not required.

Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design

Stream energy has the potential to erode the channel bed and banks due to lateral confinement during high flow events. However, the various proposed seepage control and erosion treatments would not increase or intensify these current geomorphic processes. Additionally, none of the project alternatives involve an increase in levee height, which can potentially further increase erosion of the channel bed and banks depending on the longitudinal position of the river reach within the drainage network. Alternative 1 would therefore have no effect on channel bed incision or bank erosion. Mitigation is not required.

Effect FC-3: Decrease in Through- and Under-Seepage

Through- and under-seepage has the potential to weaken levee foundations. Slurry cutoff walls would reduce or eliminate the potential for seepage. Slurry cutoff walls create walls of impermeable material that act as a barrier to water moving laterally through a levee, greatly reducing or eliminating the potential for through-and under-seepage. Similarly, seepage berms result in a wide embankment structure that resists accumulated water pressure and safely releases seeping water. Finally, clay ditch lining and depression/ditch infilling would also help to remediate through- and under-seepage by either creating hydraulic barriers or by infilling depressions and ditches where seepage exits. These project features would result in beneficial effects on flood conditions in the planning area.

Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage

Slope flattening would help to decrease relative erosion rates by alleviating over-steepened banks. Slope flattening would involve up-to-date design and construction methods to avoid erosion, and it is assumed that bank erosion on the newly reshaped bank on the water side would remain minimal, as features associated with this treatment would be engineered to withstand the forces of erosion by flowing water.

Slope flattening is not anticipated to have a measurable effect on through- and under-seepage potential. In the project area itself, other treatments aim to rectify through- and under-seepage concerns.

Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition

Because Alternative 1 would leave the existing levee in place, no geomorphic assessment of scour and/or deposition patterns was completed. Floodplain capacity would remain similar to existing conditions under most flows. However, for flows greater than the 200-year event that overtopped the existing levee, there is potential for both scour of and deposition onto the floodplain. However, overtopping of the levees in the project area is not common and the various proposed seepage control and erosion treatments would not increase or intensify these current geomorphic processes. Encroachment removal would not present an adverse effect as the encroachment removals would

be localized in nature. Alternative 1 would therefore have no effect on related to change in stream energy and modification of floodplain scour/deposition. Mitigation is not required.

Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area

Implementation of certain elements associated with Alternative 1 (e.g., full levee degradations and reconstructions) would involve disturbance to the entire levee. Drainage infrastructure maintained by local landowners or local agencies could be affected in some locations, and local surface runoff patterns could be altered. Because interference with drainage could cause or exacerbate localized flooding, this effect would be adverse. The implementation of Mitigation Measure FC-MM-1 would reduce this effect to not adverse.

Mitigation Measure FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design

The agencies implementing project components and their primary contractors for engineering design and construction will ensure that the following measures are implemented to avoid adverse effects associated with disruption of local drainage systems.

During final project design, project engineers will coordinate with owners and operators of local drainage systems and landowners served by the systems to evaluate pre- and post-project drainage needs and design features to remediate any project-related substantial drainage disruption or alteration in runoff that would increase the potential for localized flooding. If substantial alteration of runoff patterns or disruption of a local drainage system could result from a project feature, a drainage study will be prepared as part of final project design. The study will consider the design flows of any existing facilities that would be crossed by project features and develop appropriate plans for relocation or other modification of these facilities and construction of new facilities, as needed, to ensure equivalent functioning of the system during and after construction. If no drainage facilities (e.g., ditches, canals) would be affected, but project features would have a substantial adverse effect on runoff amounts and/or patterns, new drainage systems will be included in the design of project alternatives to ensure that the project would not result in new or increased localized flooding. Any necessary features to remediate project-induced drainage problems will be installed before the project is completed or as part of the project, depending on site-specific conditions.

Effect FC-7: Increase in Levee Slope Stability

Alternative 1 involves all cut-off walls that would benefit levee slope stability. Cut-off walls act to limit the through-flow of water the levee foundation. Treatments that increase levee slope stability would have beneficial effects on geomorphic and flood conditions in the planning area. Alternative 1 would therefore have a beneficial effect on levee slope stability.

3.1.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on ~~flood control~~flood risk management and geomorphic conditions. These potential effects and related mitigation measure requirements are summarized in Table 3.1-5 and discussed below.

Table 3.1-5. ~~Flood Control~~Flood Risk Management and Geomorphic Conditions Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design	No effect	None required	No effect
Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design	No effect	None required	No effect
Effect FC-3: Decrease in Through- and Under-Seepage	Beneficial	None required	Beneficial
Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage	Beneficial	None required	Beneficial
Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition	No effect	None required	No effect
Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area	Significant	FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design	No effect
Effect FC-7: Increase in Levee Slope Stability	Beneficial	None required	Beneficial

Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design

Effects associated with Effect FC-1 under Alternative 2 are identical to those described above for Effect FC-1 under Alternative 1. Alternative 2 would therefore have no effect related to changes in water surface elevations and ~~flood safety~~risk to health and safety. Mitigation is not required.

Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design

Effects associated with Effect FC-2 under Alternative 2 are identical to those described above for Effect FC-2 under Alternative 1. Alternative 2 would therefore have no effect on channel bed incision or bank erosion. Mitigation is not required.

Effect FC-3: Decrease in Through- and Under-Seepage

Effects associated with Effect FC-4 under Alternative 2 are similar to those described above for Effect FC-4 under Alternative 1. Alternative 2 would therefore have a beneficial effect related to through- and under-seepage.

Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage

Effects associated with Effect FC-5 under Alternative 2 are similar to those described above for Effect FC-5 under Alternative 1. Alternative 2 would therefore have a beneficial effect related to risk of levee failure as a result of erosion or seepage.

Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition

Effects associated with Effect FC-6 under Alternative 2 are identical to those described above for Effect FC-6 under Alternative 1. Alternative 2 would therefore have no effect related to change in stream energy and modification of floodplain scour/deposition.

Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area

Implementation of certain elements associated with Alternative 2 (e.g., stability berms and relief wells) would involve earthwork on the top and/or landward side of the levee. The new material on the land side could cross drainage infrastructure maintained by local landowners or local agencies in some locations or alter surface runoff patterns. Because interference with drainage could cause or exacerbate localized flooding, this effect would be adverse. The presence of a newly modified levee itself (via levee degradation and reconstruction) also could alter the course of local runoff, as described above under Effect FC-6 under Alternative 1. The implementation of Mitigation Measure FC-MM-1 would reduce this effect to not adverse.

Effect FC-7: Increase in Levee Slope Stability

Stability berms can result in increased levee slope stability. A stability berm typically is constructed against the landside slope of the levee and acts as a buttress to stabilize slopes. Treatments that increase levee slope stability would have beneficial effects on geomorphic and flood conditions in the planning area. Alternative 2 would therefore have a beneficial effect on levee slope stability.

3.1.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on ~~flood control~~flood risk management and geomorphic conditions. These potential effects and related mitigation measure requirements are summarized in Table 3.1-6 and discussed below.

Table 3.1-6. ~~Flood Control~~Flood Risk Management and Geomorphic Conditions Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design	No effect	None required	No effect
Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design	No effect	None required	No effect
Effect FC-3: Decrease in Through- and Under-Seepage	Beneficial	None required	Beneficial
Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage	Beneficial	None required	Beneficial
Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition	No effect	None required	No effect
Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area	Significant	FC-MM-1: Coordinate with Owners and Operators, Prepare Drainage Studies as Needed, and Remediate Effects through Project Design	No effect
Effect FC-7: Increase in Levee Slope Stability	Beneficial	None required	Beneficial

Effect FC-1: Change in Water Surface Elevations and ~~Flood Safety~~Risk to Health and Safety Attributable to Project Design

Effects associated with Effect FC-1 under Alternative 3 are identical to those described above for Effect FC-1 under Alternatives 1 and 2. Alternative 3 would therefore have no effect related to change in water surface elevations and ~~flood safety~~risk to health and safety.

Effect FC-2: Increase in Channel Bed Incision and Bank Erosion Attributable to Project Design

Effects associated with Effect FC-2 under Alternative 3 are identical to those described above for Effect FC-2 under Alternatives 1 and 2. Alternative 3 would therefore have no effect on channel bed incision or bank erosion.

Effect FC-3: Decrease in Through- and Under-Seepage

Effects associated with Effect FC-3 under Alternative 3 are similar to those described above for Effect FC-3 under Alternatives 1 and 2. Alternative 3 would therefore have a beneficial effect on through- and under-seepage.

Effect FC-4: Decrease in Risk of Levee Failure as a Result of Erosion or Seepage

Effects associated with Effect FC-4 under Alternative 3 are similar to those described above for Effect FC-4 under Alternatives 1 and 2. Alternative 3 would therefore have a beneficial effect related to risk of levee failure as a result of erosion or seepage.

Effect FC-5: Change in Stream Energy and Modification of Floodplain Scour/Deposition

Effects associated with Effect FC-5 under Alternative 3 are identical to those described above for Effect FC-5 under Alternatives 1 and 2. Alternative 3 would therefore have no effect related to change in stream energy and modification of floodplain scour/deposition.

Effect FC-6: Alteration of the Existing Drainage Pattern of the Site or Area

Effects associated with Effect FC-6 under Alternative 3 are similar to those described above for Effect FC-6 under Alternatives 1 and 2. However, effects associated with Effect FC-6 under Alternative 3 are less adverse than under Alternatives 1 and 2 because there is less landward disturbance associated with Alternative 3. The implementation of Mitigation Measure FC-MM-1 would reduce this effect to not adverse.

Effect FC-7: Increase in Levee Slope Stability

Effects associated with Effect FC-7 under Alternative 3 are similar to those described above for Effect FC-7 under Alternatives 1 and 2. Alternative 3 would therefore have a beneficial effect on levee slope stability.

3.2 Water Quality and Groundwater Resources

3.2.1 Introduction

This section describes the regulatory and environmental setting for water quality and groundwater resources; effects on water quality and groundwater resources that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.2.2 Affected Environment

This section describes the affected environment for water quality and groundwater resources in the project area. The key sources of data and information used in the preparation of this section are listed below.

- California Water Plan Update 2009, Bulletin 160-09 (California Department of Water Resources 2009).
- Central Valley Regional Water Quality Control Board Water Quality Control Basin Plan, Central Valley Region – The Sacramento River Basin and the San Joaquin River Basin (Central Valley Regional Water Quality Control Board 2009).
- Butte County General Plan 2030 (Butte County 2010).
- Sutter County General Plan, Public Draft (Sutter County 2010).
- City of Yuba City General Plan (City of Yuba City 2004).
- City of Live Oak 2030 General Plan (City of Live Oak 2010).
- City of Biggs General Plan 1997–2015 (City of Biggs 1998).
- City of Gridley 2030 General Plan (City of Gridley 2010).
- The Sacramento Valley Integrated Regional Water Management Plan (California Department of Water Resources 2007).
- West Sacramento Levee Improvements Program, 408 Permission Environmental Impact Statement/Environmental Impact Report (ICF International 2010a).

3.2.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to water quality and groundwater resources. Additional regulatory information appears in Appendix A.

Federal

Clean Water Act

The State Water Resources Control Board (State Water Board) is the state agency with primary responsibility for implementing the CWA, which establishes regulations relating to water resources issues. Typically, all regulatory requirements are implemented by the State Water Board through

nine ~~Regional Water Quality Control Boards (~~RWQCBs~~)~~ established throughout the state. The Central Valley RWQCB is responsible for regulating discharges to the Feather River and its tributaries.

The CWA is the primary Federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit. Permit review is the CWA's primary regulatory tool under the following sections.

- Section 404, which regulates the discharge of dredged and fill materials into "waters of the United States," which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States before proceeding with a proposed activity. The Feather River and other features in the project area may be jurisdictional waters of the Unites States and subject to Section 404.
- Section 402, regulates discharges to surface waters through the NPDES program, administered by EPA. In California, the State Water Board is authorized by EPA to oversee the NPDES program through the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. A SWPPP and pollution prevention and monitoring program (PPMP) may be required for construction of the FRWLP to comply with the Construction General Permit and General Dewatering Permit, respectively, under Section 402.
- Section 401, under which applicants for a Federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate. In this case, the RWQCB must issue a certification to USACE or their applicant for USACE Section 404 action.
- Section 303, under which California adopts water quality standards to protect beneficial uses of state waters as required by CWA Section 303 and the Porter-Cologne Water Quality Control Act of 1969. Section 303(d) of the CWA requires the identification of water bodies that do not meet, or are not expected to meet, water quality standards (i.e., impaired water bodies). In California, the State Water Board develops the list of water quality-limited segments and the EPA approves the state's list. Section 3.2.2.2.2, *Feather River Water Quality*, discusses impaired water bodies within the planning area.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, passed in 1969, complements the CWA. It established the State Water Board and divided the state into nine regions, each overseen by an RWQCB. The State Water Board is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, although much of its daily implementation authority is delegated to the RWQCBs, which are responsible for implementing CWA Sections 402 and 303(d). In general, the State Water Board manages both water rights and statewide regulation of water quality, while the RWQCBs focus exclusively on water quality within their regions.

The Porter-Cologne Water Quality Control Act provides for the development and periodic review of water quality control plans (basin plans) for each region. The Central Valley RWQCB is responsible

for implementing the Water Quality Control Basin Plan, Central Valley Region – The Sacramento River Basin and the San Joaquin River Basin (Basin Plan) (Central Valley Regional Water Quality Control Board 2009) for the Feather River and its tributaries. The basin plan identifies beneficial uses of the river and its tributaries and water quality objectives to protect those uses. Numerical and narrative criteria are contained in the basin plan for several key water quality constituents, including dissolved oxygen (DO), water temperature, trace metals, turbidity, suspended material, pesticides, salinity, radioactivity, and other related constituents.

Basin plans are implemented primarily by using the NPDES permitting system to regulate waste discharges so that water quality objectives are met (see discussion of the NPDES program under CWA, Section 402, above). Basin plans are supposed to be updated every 3 years and provide the technical basis for determining waste discharge requirements (WDRs) and taking enforcement actions. The Central Valley RWQCB Basin Plan was last revised in 2009. Another method the Central Valley RWQCB uses to implement the Basin Plan criteria is issuing WDRs. WDRs are issued to any entity that discharges to a surface water body and does not meet certain water quality criteria such as those related to sediment. The WDR/NPDES permit also serves as a Federally required NPDES permit (under the CWA) and incorporates the requirements of other applicable regulations.

Beneficial Uses

Beneficial uses represent the services and qualities of a water body (i.e., the reasons the water body is considered valuable). The Basin Plan describes beneficial uses for the waters in the Sacramento River watershed (Central Valley Regional Water Quality Control Board 2009). Table 3.2-1 lists the beneficial uses for water bodies that are within or have influence on the hydrology of the affected area and could be affected by project activities.

Table 3.2-1. Designated Beneficial Uses for Water Bodies within or with Influence on the Hydrology of the Study Area

Beneficial Uses	Sutter Bypass	Feather River (Fish barrier dam to Sacramento River)	Yuba River (Englebright Reservoir to the Feather River)	Bear River
Municipal and Domestic	X	X	X	X
Agriculture—Irrigation		X	X	X
Agriculture—Stock Watering			X	X
Hydropower			X	X
Rec-1—Contact	X	X	X	X
Rec-1—Canoeing and Rafting		X	X	X
Rec-2—Other Noncontact		X	X	X
Freshwater Habitat—Warm	X	X	X	X
Freshwater Habitat—Cold		X	X	X
Migration—Warm		X	X	X
Migration—Cold	X	X	X	X
Spawning—Warm		X	X	X
Spawning—Cold	X	X	X	X
Wildlife Habitat	X	X	X	X
Navigation		X		

Source: Central Valley Regional Water Quality Control Board 2009.
X = present or potential beneficial use.

Water Quality Objectives

Water quality objectives represent the standards necessary to protect and support designated beneficial uses. The RWQCBs have set water quality objectives for all surface waters in their respective regions (including the Feather River) for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, DO, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity.

State Implementation Plan

In 1994, the State Water Board and EPA agreed to a coordinated approach for addressing priority toxic pollutants in inland surface waters, enclosed bays, and estuaries of California. In March 2000, the State Water Board adopted a state implementation plan (SIP) for priority toxic pollutant water quality criteria contained in the California Toxics Rule (CTR). The EPA promulgated the CTR in May 2000. The SIP also implements National Toxics Rule (NTR) criteria and applicable priority pollutant objectives in the basin plans. In combination, the CTR and NTR and applicable basin plan objectives, existing RWQCB beneficial use designations, and SIP compose water quality standards and implementation procedures for priority toxic pollutants in non-ocean surface waters in California, such as the Feather River.

California Department of Fish and Game 1601 Streambed Alteration Agreement

Section 1602 of the California Fish and Game Code requires project proponents to notify ~~DFG~~CDFW before any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When water quality or supply may be substantially adversely affected, ~~DFG~~CDFW is required to propose reasonable changes to the project to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

Local

As detailed in Appendix A, Sutter County, Butte County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley have each adopted general plan goals and policies aimed toward preserving and protecting water supply and quality. In addition, the following stormwater management programs are in place.

Yuba City-Sutter County Storm Water Management Program

Sutter County and the City of Yuba City are co-permittees of the NPDES Phase II General Permit for Municipal Separate Storm Sewer Systems (MS4 General Permit), which requires the development of a Stormwater Management Plan (SWMP). Adopted in 2003, the Yuba City-Sutter County SWMP is a combined effort of the city and county, which addresses stormwater discharges to the Sutter Bypass and the Feather River through pumping stations located along several levees. This SWMP describes the approach to reduce stormwater pollution. It includes the required six minimum control measures required under the NPDES Phase II MS4 program: public education and outreach; public participation/involvement; illicit discharge detection and elimination; construction site runoff control; post-construction runoff control; and pollution prevention/good housekeeping (City of Yuba City and Sutter County 2003).

Butte County Storm Water Management Program

Butte County has been covered under an NPDES Phase II MS4 General Permit since 2004. Currently, Butte County's MS4 General Permit covers the urbanized unincorporated areas within and around the City of Chico. As part of permit compliance, the Butte County Department of Public Works implements a SWMP (Butte County Public Works 2009).

3.2.2.2 Environmental Setting

The following considerations are relevant to water quality and groundwater resources conditions in the proposed project area.

Climate

The climate of the affected area is characterized by hot/dry summers, with highs in the upper 90s (degrees Fahrenheit [°F]) and lows in the low 60s (°F), and cool/wet winters, with highs in the mid-50s (°F) and lows in the upper 20s (°F).

Precipitation in the planning area occurs mostly as rain, and yearly totals average approximately 20 inches (U.S. Army Corps of Engineers 2004). Approximately 95% of the annual rainfall occurs between October and April (U.S. Army Corps of Engineers 2004). Precipitation increases with elevation. The mean annual precipitation is 18.0 inches at Marysville, at an elevation of 57 feet, just east of the project area (David Ford Consulting Engineers, Sutter Basin Design Rainfall Memo, dated June 14, 2011). In the upper Feather River Basin near Lassen Peak, as much as 90 inches of precipitation fall annually (U.S. Army Corps of Engineers 2004).

Feather River Water Quality

The lower Feather River originates at the Oroville Dam and meanders south to its confluence with the Sacramento River near Verona and drains the western slope of the Sierra Nevada Mountains and the Sutter Buttes. The lower Feather River watershed consists of approximately 788 square miles or about 13% of the entire Feather River drainage (Foothill Associates 2010:27). It is entirely contained by a series of levees and native high ground.

Flows from the Feather River are captured, stored, and diverted for hydroelectric power production, irrigation, ~~flood control~~flood risk management, domestic water supply, and recreation (Foothill Associates 2010:27). The Feather River watershed is one of the most hydrologically modified river basins in California largely due to releases from the Oroville Dam. Water is released from the Oroville Facilities as part of a coordinated effort to meet water supply, ~~flood protection~~level of performance, water quality improvement, and fish and wildlife enhancement requirements. Lake Oroville is owned and operated by DWR, and is the largest reservoir in the State Water Project (SWP) with a capacity of 3.5 million acre-feet (MAF) (Sutter County 2008). Built in 1968, the Oroville Dam is located on the Feather River, 4 miles northeast of the City of Oroville.

The Oroville Dam is used as a peak operating power facility[1] in conjunction with the Thermalito Facilities; this system of facilities is known as the Oroville-Thermalito Complex. Water released from Lake Oroville is used to produce electricity by the Hyatt Pumping-Generating Plant. Because of power operations, releases are made on a peaking basis of up to 16,950 cfs when power is in high

[1] During normal operation, a 24-hour supply of water flows through both plants during a peak 6–10 hour window of the day when power production is most needed.

demand (on-peak) with little or no release the remainder of the day (off-peak). The water that flows through the Hyatt Pumping-Generating Plant is discharged into the Thermalito Diversion Pool, where the flows are diverted into the Thermalito Forebay, the Feather River Fish Hatchery, or the Low Flow Channel. From the Thermalito Forebay, flows can be diverted into either several canals or released through the Thermalito Pumping–Generating Plant to the Thermalito Afterbay. From the Thermalito Afterbay, flows can be diverted into several canals or released to the Feather River.

Water quality in the Lower Feather River Watershed is primarily influenced by agricultural and urban runoff, as well as municipal water use in surrounding areas. Contaminants from urban runoff can vary depending on rainfall intensity and occurrence, geographic features, land use, vehicle traffic, and percent of impervious surface (Sacramento River Watershed Program 2010). During the dry period in the affected area (May–October), pollutants from various sources—such as vehicles; residential, industrial, and agricultural land uses; and atmospheric fallout—accumulate on the land surrounding water bodies. These contaminants can be mobilized from stormwater runoff during the wet season (November–April). The initial runoff, known as the *first flush*, typically contains peak pollutant levels.

Water quality dynamics also have been influenced by the operation of flow-regulating facilities within and around the affected area. Variations in some water quality parameters may be correlated with fluctuations in flow throughout the year. The storage and diversion of water for hydroelectric and other purposes can have an effect on downstream beneficial uses by affecting water temperature and turbidity. Turbidity and sediment levels spike during heavy storm runoff in the winter and spring. In the spring and early summer, the water quality is primarily affected by agricultural drainage and natural runoff. During periods of low flows, specifically the late summer–early fall, water quality decreases due to high water temperatures and concentrations of pollutants.

Table 3.2-2 summarizes water quality impairments in surface waters in the planning area and the sources of these impairments. The information provided in Table 3.2-2 is based on the 2010 proposed 303(d) list. Updates to the 303(d) list must be finalized by the EPA before becoming effective.

Table 3.2-2. CWA Section 303(d)-Listed Impaired Water Bodies and Associated Potential Sources within the Planning Area Watershed

Water Body	Listed Pollutants	Associated Potential Sources
Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River)	Chlorpyrifos	Agriculture
	Group A pesticides	Agriculture
	Mercury	Resource extraction
	PCBs	Unknown
	Unknown toxicity	Unknown
Oroville Wildlife Area Fishing Pond (Butte County)	Unknown toxicity	Unknown
Gilsizer Slough (from Yuba City to downstream of Township Road, Sutter County)	Diazinon	Agriculture
	Oxyfluofen	Agriculture
	pH	Unknown
Wadsworth Canal	Chlorpyrifos	Agriculture
	Diazinon	Agriculture
Morrison Slough	Diazinon	Unknown
Sutter Bypass	Mercury	Resources extraction

Water Body	Listed Pollutants	Associated Potential Sources
Live Oak Slough	Diazinon	Agriculture
	Oxyfluorfen	Agriculture
	Dissolved oxygen	Unknown

Source: 2010 Integrated Report (State Water Resources Control Board 2010).
PCBs = polychlorinated biphenyls.
DDT = dichlorodiphenyltrichloroethane.
Note: The proposed project would likely only affect the Feather River.

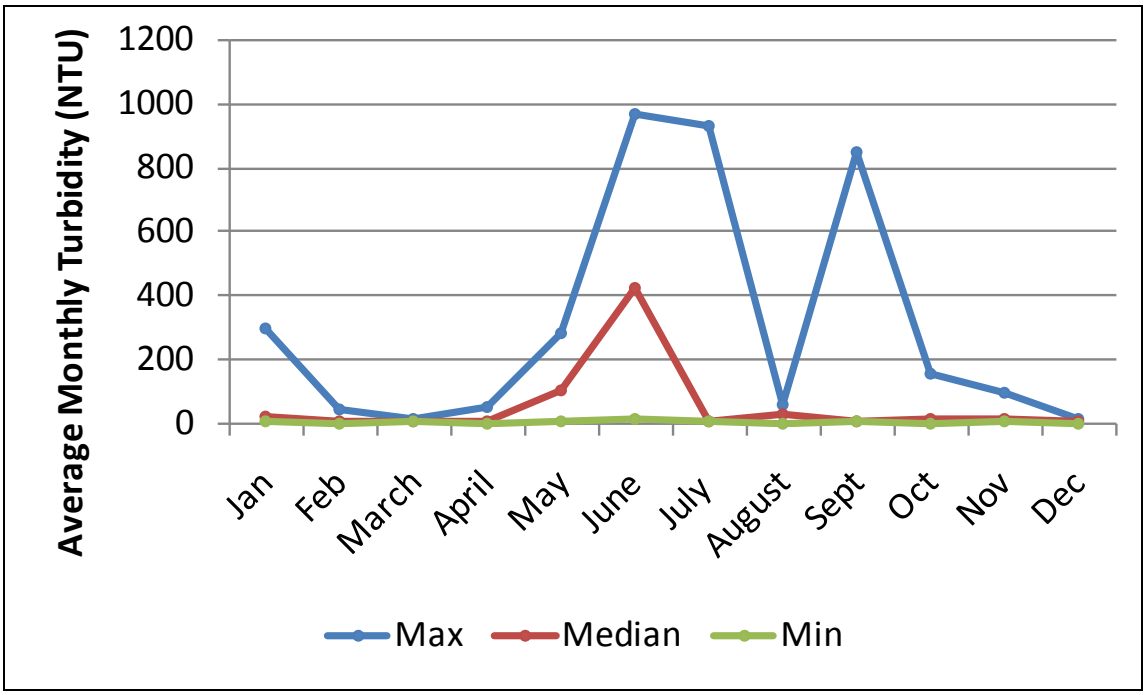
Total Suspended Sediment and Turbidity

Total suspended sediment (TSS) is indicative of upstream scouring, bank erosion, and agricultural return flow transporting and depositing sediment (ICF International 2010a). Turbidity is a convenient field measurement that can be switched to TSS using simple conversions. Excessive soil erosion and sedimentation can affect beneficial uses of water by (1) silting over fish spawning habitats; (2) clogging drinking water intakes; (3) decreasing channel capacity and increasing downstream flooding; (4) creating unstable stream channels; and (5) losing riparian habitat (California Department of Water Resources 2009). In addition, other contaminants may be adsorbed onto sediment.

Although sedimentation is a natural part of the flow regime for rivers, the Central Valley RWQCB also considers it a pollutant. Excessive sedimentation from construction practices such as placement of riprap on levees or constructing slurry cutoff walls can smother filter-feeding stream organisms and cause other serious water quality related issues. The Basin Plan states that where ambient turbidity is between 5 and 50 NTUs, projects shall not increase turbidity on the Feather River by more than 20% above the ambient conditions (Central Valley Regional Water Quality Control Board 2009). Furthermore, if the background diurnal variation in turbidity fluctuates in and out of the 5-and-50 NTU threshold, the Basin Plan states that averaging periods can be applied to data to determine compliance. Where the ambient turbidity is between 50 and 100 NTUs, a project must not cause turbidity to increase by more than10 NTUs above ambient conditions. Construction BMPs would minimize the temporary increases in TSS and turbidity caused by construction activities that disturb the land and allow higher TSS or turbidity during storm event runoff.

Turbidity in the Feather River is variable and depends on water source and flow (velocity). Average monthly turbidity (NTU) from the California Data Exchange Center (CDEC) Station on the Feather River at Gridley (Plate 3.2-1) shows that median turbidity values appear to increase during the time of spring snowmelt.

Plate 3.2-1. Average Monthly Turbidity (NTU) on the Feather River at Gridley (2003–2006)



Dissolved Oxygen, Temperature, Electrical Conductivity, and pH

DO is a critical component for all forms of aquatic life. It also can naturally be variable and subject to fluctuations in short time periods. High DO concentrations (within 1 or 2 milligrams per liter [mg/L] of saturated DO) are usually maintained by surface re-aeration, unless there is a high biochemical oxygen demand (BOD) from a discharge or from algae. Some water bodies can thermally stratify, causing deeper zones to have low DO concentrations. Algae blooms can cause large swings in DO levels, producing oxygen while growing but consuming oxygen while decaying.

When DO concentrations fall below certain limits, the resulting low-DO zones can act as a barrier to fish migration and potentially adversely affect spawning success. In extreme cases, persistent low concentrations of DO can result in mortality of benthic organisms and other aquatic species. The Basin Plan objective for DO in the Feather River (from Fish Barrier Dam at Oroville to Honcut Creek) is 8.0 mg/L between September 1 and May 31 of each year (Central Valley Regional Water Quality Control Board 2009).

Water temperature is a critical constituent from the standpoint of aquatic life. The Basin Plan objective for temperature requires that it not be increased more than 5°F above natural receiving water temperature (Central Valley Regional Water Quality Control Board 2009). The Oroville Facilities are currently operated to meet water temperature objectives for fish at the intake to the Feather River Fish Hatchery, and at the Robinson Riffle in the Low Flow Channel, about 5 miles below the Thermalito Diversion Dam. Water temperatures at these two locations are managed by DWR using multi-level intakes for the releases from Oroville to control water temperatures of the release from Oroville Reservoir and the heating that takes place in the Low Flow Channel to Robinson Riffle (U.S. Bureau of Reclamation 2008).

The potential of hydrogen (pH) is a unit for measuring the acidity (hydrogen ion activity) in water. Many biological functions can occur only within a narrow range of pH values. The Basin Plan objective for pH is between 6.5 and 8.5. Furthermore, discharges cannot result in changes of pH that exceed 0.5. Some construction materials such as concrete or other chemicals could affect the pH of nearby streams if a discharge were to occur.

Electrical conductivity (EC) is a water quality parameter that can be conveniently measured in the field and that is representative of salinity and total dissolved solids (TDS). TDS and EC are general indicators of salinity and are regulated under the Basin Plan. Basin Plan objectives for EC on the Feather River from the Fish Barrier Dam to the Sacramento River are 150 microsiemens per centimeter (µS/cm) in well-mixed waters.

Pesticides

Pesticides such as diazinon and chlorpyrifos are used to exterminate destructive pests and insects such as aphids, spider mites, fleas, ants, roaches, and boring insects. A significant reduction in the use of diazinon and chlorpyrifos has occurred in the past decade since non-agricultural uses of diazinon were banned in December 2004 and non-agricultural uses of chlorpyrifos were banned in December 2001.

In October 2003, the Central Valley RWQCB established total maximum daily load (TMDL) regulations for diazinon in the lower Feather River. The TMDL document recommended three strategies for reducing diazinon loading: (1) reducing diazinon use, (2) reducing surface water runoff from sprayed orchards, and (3) delaying and/or filtering orchard runoff containing diazinon. Recent monitoring (2006 and 2007) indicated diazinon loading to the lower Feather River has been reduced significantly (Sacramento River Watershed Program 2010).

The Basin Plan states that "beginning August 11, 2008, the direct or indirect discharge of diazinon or chlorpyrifos into the Sacramento and Feather Rivers is prohibited if, in the previous year (July–June), any exceedance of the diazinon or chlorpyrifos water quality objectives, or diazinon and chlorpyrifos loading capacity occurred." However, these prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of WDRS or governed by individual or general WDRs.

Water quality objectives for these pesticides along the Feather River from the Fish Barrier Dam to the Sacramento River are shown in Table 3.2-3.

Table 3.2-3. Water Quality Objectives for Pesticides along the Feather River

Pesticide Name	Maximum Concentration and Averaging Period
Chlorpyrifos	0.025 µg/L; 1-hour average (acute) 0.015 µg/L; 4-day average (chronic) Not to be exceeded more than once in a 3-year period.
Diazinon	0.16 µg/L; 1-hour average (acute) 0.10 µg/L; 4-day average (chronic) Not to be exceeded more than once in a 3-year period.

Source: Central Valley Regional Water Quality Control Board 2009.
µg/L = micrograms per liter.

Contaminants

In the Sacramento and San Joaquin River basins, industrial and municipal discharge and agricultural runoff transport contaminants into rivers and streams that ultimately flow into the Delta. Principal pollutants in the Delta are agricultural chemicals and their derivatives (Herbold et al. 1992). Organophosphate insecticides, such as carbofuran, chlorpyrifos, and diazinon, are present throughout the Central Valley and dispersed in agricultural and urban runoff. The *first-flush* storm event or the *dormant spray* storm event is of most concern because of the higher concentration of contaminants in the runoff. In particular, diazinon and chlorpyrifos are applied to control wood-boring insects in dormant stone fruit orchards from December to February (Zamora et al. 2003). These contaminants enter rivers in winter runoff and enter the estuary in concentrations that can be toxic to invertebrates (CALFED Bay-Delta Program 2000). Unlike severe bioaccumulators such as organochlorine pesticides, organophosphate pesticides are typically metabolized by most invertebrates. However, some organophosphate pesticides do not bioaccumulate, and some do bioaccumulate. In particular, diazinon has a solubility of 68.9 mg/L (at 68°F), but should not bioaccumulate in aquatic organisms (Zamora et al. 2003). Chlorpyrifos, on the other hand, is more persistent in the environment and tends to be hydrophobic to the water column. Chlorpyrifos has a lower solubility than diazinon (1.12 mg/L at 75°F) and has a significant potential to bioaccumulate in aquatic organisms (Zamora et al. 2003). Because some organophosphate may accumulate in living organisms, they may become toxic to fish species, especially those life stages that remain in the system year-round and spend considerable time there during the early stages of development, such as Chinook salmon, steelhead, splittail, and green sturgeon.

Mercury contamination from historical mining activities is extensive on both sides of the Central Valley and occurs primarily from widely scattered hydraulic mining debris along eastside tributaries and active abandoned mines and associated debris piles on the west side. These sources continue to deposit significant amounts of mercury into the Bay-Delta system. The Cosumnes River, Yolo Bypass, and Sacramento River are the primary ongoing sources of mercury contamination in the Bay-Delta. Mercury occurs in several forms, including pure elemental mercury and toxic methylmercury. Mercury is mobile in aquatic systems as aqueous mercury or when attached to suspended particulate matter. Methylmercury is a significant water quality concern because small amounts can bioaccumulate in fish to levels that are toxic to humans and wildlife. In the Delta, mercury concentrations in bluegill, Sacramento sucker, and largemouth bass have been found to exceed the human health standard of 0.5 part per million (ppm) by two to six times (Slotten 1991).

Other contaminants of particular concern in the Bay-Delta system include high concentrations of trace elements such as selenium, copper, cadmium, and chromium; however, their effects on higher trophic levels are poorly understood, in part as a result of the complex distribution of high concentrations in both time and space (Herbold et al. 1992). In general, it appears that the highest concentrations occur in areas where human activity adjacent to the bay is also the highest. Although these trace elements also occur naturally, concentrations of these trace elements have been found to be high enough to adversely affect the growth and reproduction of aquatic animals in laboratory experiments (Herbold et al. 1992).

In the Feather River, historical gold mining practices as well as the development of municipal and industrial land uses in the upper watershed and along the lower Feather River, continue to be the primary sources for most of the metals found in the river. Pesticides are used to control mosquitoes and herbicides are applied for routine and ongoing maintenance of recreational and other facilities (California Department of Water Resources 2007).

Groundwater Quantity and Quality

The project area is located within the East Butte and Sutter groundwater subbasins of the greater Sacramento Valley Groundwater Basin (Sutter County 2008). Groundwater is extracted for agricultural, municipal, industrial, and environmental wetland uses. The East Butte Subbasin is bounded on the north by the confluence of Butte Creek and the Sacramento River and Sutter Buttes, on the west by the Sacramento River, on the south by the confluence of the Sacramento River and the Sutter Bypass, and on the east by the Feather River. The subbasin has groundwater level fluctuations between 4 feet during normal years and up to 10 feet during drought years (Sutter County 2008). The Sutter Subbasin is bounded on the north by the confluence of Butte Creek and the Sacramento River and Sutter Buttes, on the west by the Sacramento River, on the south by the confluence of the Sacramento River and the Sutter Bypass, and on the east by the Feather River. The Sutter Subbasin has relatively constant groundwater levels that tend to be within 10 feet of the ground surface (Sutter County 2008).

Four major freshwater aquifer formations exist in the northern Sacramento Valley: (1) the Alluvial deposits; (2) the Tuscan Formation, Units A and B; (3) the Tuscan Formation, Unit C; and (4) the Tehama Formation. These deposits overlie the marine, or saline, formations and are the major source of fresh groundwater to wells (Fulton et al. 2003).

The Alluvial aquifer system is the uppermost groundwater bearing unit, reaching from ground surface to maximum depth of about 200 feet. Many domestic wells draw water from this aquifer system. The Upper Tuscan aquifer (Tuscan Unit C) system is exposed on the east side of the valley along the foothills and is found at a depth of about 800 feet in the central portion of the valley. This aquifer system extends west past the Sacramento River under the surface, and underlies the Alluvial aquifer system. The Lower Tuscan aquifer (Tuscan Units A and B) system lies beneath the Upper Tuscan system, and is also exposed on the east side of the valley. In the central portion of the valley, it is found at a depth of about 1,000 feet below ground surface. The Tuscan Formation is considered an important deep system that is theorized to underlie most of the valley area. The highest-producing wells in alluvial uplands occur when older alluvium or the deeper Tuscan volcanic rocks are tapped (Butte County 2005). The Tehama Formation aquifer system is exposed on the west side of the Sacramento Valley, at a depth ranging from the ground surface to about 1,000 feet.

There are numerous groundwater wells used for both crop irrigation and drinking water supply in the affected area. The Sacramento Valley portion of Butte County has approximately 9,400 wells (Butte County 2005). Although groundwater levels are known to drop during drought periods and groundwater overdraft has historically occurred in portions of the planning area, overdraft conditions are reported to be relatively stable at present (Sutter County 2008). Spring to fall fluctuation of groundwater levels in the unconfined portion of the aquifer system averages only 1 to 2 feet during years of normal precipitation and years of drought, respectively. Groundwater levels rise during the summer months as the upper aquifer recharges due to flood irrigation for rice production (Butte County Water Commission 2010).

Groundwater quality in Sutter County ranges from poor to very good and includes contaminants in some areas resulting from both natural conditions and human influence (Sutter County 2008). Some groundwater is hard water (high calcium and magnesium), and some has higher levels of iron, manganese, and arsenic, and some areas also have high nitrates. Constituents of general concern for groundwater are TDS, nitrate, and several other individual chemical constituents (Sacramento River Watershed Program 2010). Septic systems can introduce nitrates, salts, bacteria, viruses,

medications, household chemicals, and other contaminants into the groundwater. Nitrate contamination can also come from agricultural practices.

Prior to 1969, all urban water demands were met with groundwater. In 1969, a new surface water treatment plant began to deliver treated surface water from the Feather River to Yuba City. The switch to surface water was needed because of water quality problems associated with the use of groundwater, including high levels of manganese, arsenic, sulfides, nitrates, and iron (California Department of Water Resources 2007). High nitrate levels have been found to be generally concentrated around Yuba City, with isolated areas of high concentration in the northern part of Sutter County and in the southern portion south of the Bear River (Sutter County 2008). In 2001, Yuba City received a notice from the County Department of Health Services for nitrate exceedance of drinking water standards in its groundwater, Region 5—Tierra Buena water system. This same year, Yuba City purchased Hillcrest Water District, which was located southwest of the city, and continued to use the district's three wells to meet the water needs of its customers. Currently, about 20% of Yuba City's water needs are met with the groundwater from the three purchased wells (California Department of Water Resources 2007).

Not all of the wells meet the arsenic standards approved by EPA (ICF International 2010b). Arsenic occurs naturally in the soils/bedrock of several areas in Sutter County (Sutter County 2008). Naturally occurring arsenic enters the groundwater at concentrations that exceed EPA's maximum contaminant level (MCL) of 10 micrograms per liter (µg/L). The EPA arsenic MCL applies only to public water systems (not to private wells). Many of the private and public groundwater wells in the county do not meet the current MCL. Groundwater in local districts near Yuba City has an average arsenic concentration of 14.4 µg/L. The city is evaluating options related to converting these customers from groundwater supply to surface water supply, or treating the groundwater to meet all primary and secondary standards.

3.2.3 Environmental Consequences

This section describes the environmental consequences relating to water quality and groundwater resources for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.2.3.1 Assessment Methods

This evaluation of water quality and groundwater resources is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

3.2.3.2 Determination of Effects

For this analysis, an effect pertaining to water quality and groundwater resources was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Violate any water quality standards or WDRs.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Substantially degrade water quality.

As part of the project, four environmental commitments could reduce or eliminate water quality and groundwater effects (see Section 2.4 of Chapter 2, *Alternatives*). These environmental commitments call for development and implementation of four plans and were included in the assessment of project effects.

- SWPPP.
- BSSCP, also known as a frac-out plan.
- SPCCP.
- Turbidity monitoring plan.

3.2.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning water quality and groundwater resources are summarized in Table 3.2-4.

Table 3.2-4. Summary of Effects for Water Quality and Groundwater Resources

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids	Less than significant	None required	Less than significant
Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials	Less than significant	None required	Less than significant
Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table	Significant	WQ-MM-1: Implement Provisions for Dewatering	Less than significant
Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment	Less than significant	None required	Less than significant

3.2.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions. No levee improvements would be made to increase the level of protection. No construction-related effects relating to water quality and groundwater resources such as release of contaminants or sediments to surface water would occur. Therefore, there would

be no effect on water quality and groundwater resources attributable to the implementation of the No Action Alternative.

However, without levee improvements, there is the continued risk of levee failure. Under-seepage and loss of levee foundation soils would be expected to continue. A catastrophic levee failure would result in collapse of levee slopes and loss of soil. Furthermore, if a levee breach were to occur, emergency construction and repair activities would be implemented without the use of BMPs and could result in release of contaminants into the soil (groundwater) and adjacent surface water, as well as increased erosion, which could raise TSS and turbidity in adjacent water bodies.

3.2.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on water quality and groundwater resources. These potential effects and related mitigation measure requirements are summarized in Table 3.2-5 and discussed below.

Table 3.2-5. Water Quality and Groundwater Resources Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids	Less than significant	None required	Less than significant
Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials	Less than significant	None required	Less than significant
Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table	Significant	WQ-MM-1: Implement Provisions for Dewatering	Less than significant
Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment	Less than significant	None required	Less than significant

Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids

Construction of Alternative 1 would require the construction of slurry cutoff walls, slope flattening, levee reconstruction, seepage berms, depression/ditch infilling, clay ditch lining, and encroachment removal. These construction activities would include earth disturbance that could cause erosion and sedimentation in adjacent water bodies. Although this type of construction would occur close to the Feather River, significant sedimentation and turbidity would be unlikely to occur in the river because the majority of the construction would occur on the land side of the existing levee. Two environmental commitments are targeted at reducing or eliminating erosion and sedimentation effects: the SWPPP environmental commitment (Section 2.4.12) and the turbidity monitoring plan environmental commitment (Section 2.4.15). The SWPPP would include erosion control measures to ensure the land disturbance activities do not cause erosion that would increase sediment in the Feather River. Site-specific erosion control measures would be developed as part of a SWPPP, a requirement of the NPDES Construction General Permit. A SWPPP typically contains, but is not limited to, the following BMPs.

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

As part of a turbidity monitoring plan (Section 2.4.15), SBFCA or its contractor would monitor turbidity in the adjacent water bodies, where applicable criteria apply, to determine whether turbidity is being affected by construction and ensure that construction does not result in a substantial rise in turbidity levels above ambient conditions, in accordance with the Basin Plan turbidity objectives. The monitoring program would include monitoring ambient turbidity conditions 200 feet upstream and 200 feet downstream of construction activities. Grab samples would be collected at a downstream location that is representative of the flow near the construction site. If construction is creating a visible sediment plume, the sample would represent the plume. During all in-water construction activities, samples would be collected hourly to ensure compliance. During all other construction activities, samples would be collected on a random weekly basis.

If turbidity limits exceed Basin Plan standards, construction-related earth-disturbing activities would be modified to alleviate the problem. SBFCA or its contractor would notify the Central Valley RWQCB of the issue and provide an explanation of the cause.

In addition, suspended sediment has also been known to aid in the transport of absorbed nutrients, organic contaminants and metals such as mercury. The fraction of the metal absorbed is a constant, called the "partition" coefficient. Some metals are mostly absorbed and some are mostly dissolved. For example, mercury in its dissolved state is called methylmercury and methylmercury would not change in the river from increased transport of suspended sediments, but total mercury could be

disturbed and transported downstream from construction related disturbed sediments. Total mercury is an example of a metal that is very absorbed, so the concentration in the suspended sediment (as indicated by turbidity measurements) will be similar to the concentration of turbidity if total mercury is present in the disturbed soils where construction is taking place. Because construction does not involve any in-water construction, it is anticipated that sediments in the river will not be disturbed. In addition, the SWPPP environmental commitment (Section 2.4.12) will ensure that BMPs catch any construction related sediments prior to entering river. The turbidity monitoring plan environmental commitment (Section 2.4.15) will ensure performance of the SWPPP environmental commitment (Section 2.4.12).

The implementation of these environmental commitments would reduce potential effects on surface water quality from construction-related turbidity or TSS to a less-than-significant level. No mitigation is required.

Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials

Alternative 1 might involve storage and use of toxic and other harmful substances near the Feather River (or in areas that drain to the Feather River or other water bodies), which could result in discharge of these substances to the Feather River or other water bodies. Construction activities would involve the use of heavy equipment, cranes, compactors, and other construction equipment that use petroleum products such as fuels, lubricants, hydraulic fluids, and coolants, all of which can be toxic to fish and other aquatic organisms. In addition, placement of riprap may involve the use of a tow boat/crane and a barge carrying the riprap if the Feather River is deep enough in certain locations. The use of this equipment could contribute a direct source of contamination if equipment and construction practices were not properly followed. An accidental spill or inadvertent discharge from such equipment could affect the water quality of the river or water body.

The combination of the environmental commitments described in Chapter 2, *Alternatives*, (see Section 2.4, *Environmental Commitments*) would reduce the effect of such a release, should it occur, or reduce the likelihood that a release would occur. These environmental commitments include the development of the SWPPP, an SPCCP, a BSSCP, and a turbidity monitoring plan. All of the environmental commitments are described in detail in Section 2.4 of Chapter 2 and are summarized in Effect WQ-1. All plans would be prepared prior to the commencement of construction activities.

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

A BSSCP is typically developed for activities that involve the use of bentonite materials (e.g., the construction of slurry walls). The BSSCP is intended to minimize the potential for accidental release

of bentonite (which is used in excavation and tunneling activities), provide for timely detection of accidental bentonite release, and ensure a *minimum-effect* response in the event of an accidental bentonite release.

If the SWPPP and SPCCP fail to prevent a spill, then construction would stop, and the spill would be properly cleaned up.

Adherence to these environmental commitments would reduce this effect on surface water bodies from construction-related hazardous materials use to a less-than-significant level. No mitigation is required.

Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table

Construction of Alternative 1 would also involve trenching and excavation associated with a cutoff wall and or levee reconstruction. Such construction activities could extend to a depth that would expose the water table, create an immediate and direct path to the groundwater basin that would allow contaminants to enter the groundwater system. Primary construction-related contaminants that could reach groundwater include increased sediment, oil and grease, and hazardous materials.

Dewatering of the construction area (e.g., removing groundwater that may fill trenches dug for cutoff wall construction) is not expected to occur during project construction. However, if it became necessary, it could result in the release of contaminants to surface or groundwater.

The construction of a cutoff wall is not expected to require digging or trenching at depths where groundwater aquifers are used for drinking water. If trenching activities were to incidentally reach a groundwater aquifer used for drinking water, the slurry wall material is relatively benign and would not remain in a liquid state long enough to allow for significant lateral movement within the aquifer.

As discussed in Section 3.16, *Public Health and Environmental Hazards*, prior to all construction activities, SBFCA would complete Phase I and, if necessary, Phase II environmental site assessment investigations that would include analysis of soil and/or groundwater samples for potential contamination sites that have not yet been discovered by previous investigations. In accordance with Mitigation Measure PH-MM-1, if hazardous substances are encountered during environmental site assessment investigations or during construction, SBFCA or its contractor will implement required measures for the proper transport and disposal of such materials in accordance with the appropriate local, state, and Federal laws and regulations.

The project proponents would adhere to environmental commitments of the SWPPP, the SPCCP, and the BSSCP, as summarized under Effects WQ-1 and WQ-2. Adherence to those environmental commitments and implementation of Mitigation Measure WQ-MM-1 would reduce effect WQ-3 to a less-than-significant level.

Mitigation Measure WQ-MM-1: Implement Provisions for Dewatering

Before discharging any dewatered effluent to surface water, SBFCA or its contractors will obtain a Low Threat Discharge and Dewatering NPDES permit from the Central Valley RWQCB if the dewatering is not covered under the Central Valley RWQCB's NPDES Construction General Permit. Under the dewatering permit, discharging activities involve extensive water quality monitoring in order to adhere to the strict effluent and receiving water quality criteria outlined

in the permit. As part of the permit, the permittee will design and implement measures as necessary so that the discharge limits identified in the relevant permit are met.

For example, if dewatering is needed during the construction of any cutoff walls, the Low Threat Discharge and Dewatering NPDES permit would require treatment or proper disposal of the water prior to discharge. Treatment measures will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Implemented measures could include the retention of dewatering effluent until particulate matter has settled before it is discharged, use of infiltration areas, and other BMPs.

Final selection of water quality control measures will be subject to approval by SBFCA. SBFCA will verify that coverage under the appropriate NPDES permit has been obtained before allowing dewatering activities to begin. SBFCA or its agent will perform routine inspections of the construction area to verify that the water quality control measures are properly implemented and maintained. SBFCA will notify its contractors immediately if there is a non-compliance issue and will require compliance.

Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment

Effects on groundwater and drinking water quality from operation and construction might be significant if drinking water wells are located in close proximity to construction zones where a slurry cutoff wall is being considered because the cutoff wall may block lateral water transfer from the river to the aquifer. Less water available to the well would not only inhibit well function but may also affect well water quality. In addition, if local drinking water or agricultural wells are affected from cutoff walls, water quality may also be affected because the well pump may take in more sediment due to the potential lowering of the aquifer. HDR prepared a technical memorandum which used two models to determine the potential effects from the slurry cutoff walls. The Central Valley Hydrologic Model (CVHM) (a USGS Model) was used with a developed Local Model. Results of the CVHM model indicated that there would be a 3-foot increase in groundwater levels in the southern planning area, and a negligible change in the northern planning area along the Feather River. However, the depth to groundwater in the southern area is 10 to 30 feet below the ground surface and a 3-foot change would likely not have any significant effect on groundwater in the area. This negligible change also applies to the Sutter Bypass area. The Local Model also divided the Feather River into a northern and southern project boundary along with the Sutter Bypass. The results for all model scenarios showed a negligible change in groundwater levels. The effect on groundwater wells is considered less than significant. No mitigation is required.

3.2.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on water quality and groundwater resources. These potential effects and related mitigation measure requirements are summarized in Table 3.2-6 and discussed below.

Table 3.2-6. Water Quality and Groundwater Resources Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids	Less than significant	None required	Less than significant
Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials	Less than significant	None required	Less than significant
Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table	Significant	WQ-MM-1: Implement Provisions for Dewatering	Less than significant
Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment	Less than significant	None required	Less than significant

Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids

Construction of Alternative 2 involves all the measures under Alternative 1, along with a stability berm and relief wells. However, clay ditch lining is not part of this alternative. It is not anticipated that construction of a stability berm or relief wells would have any greater effect on ~~water quality~~turbidity, total suspended sediments or total mercury concentrations than any of the measures proposed under Alternative 1.

Implementation of the environmental commitments detailed in the Alternative 1, Effect WQ-1 discussion above, and Chapter 2, *Alternatives*, would ensure that water quality is protected from excessive turbidity and TSS from the construction proposed under Alternative 2. The effect would be less than significant. No mitigation is required.

Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials

Construction practices occurring under this alternative would be similar to those occurring under Alternative 1, except this alternative would include stability berms and relief wells, but no clay ditch lining. It is not anticipated that construction of a stability berm or relief wells would have any greater effect on water quality than any of the measures proposed for construction under Alternative 1 as similar construction equipment would be used.

Implementation of the environmental commitments detailed in the Alternative 1, Effect WQ-1, and Effect WQ-2 discussion above, and detailed in Chapter 2, *Alternatives*, would ensure that water quality is protected from construction-related hazardous materials. This effect would be less than significant. No mitigation is required.

Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table

Construction practices occurring under this alternative would be similar to those occurring under Alternative 1, with the exception that this alternative would include a stability berm and relief wells, but no clay ditch lining. It is not anticipated that construction of a stability berm would have any

greater effect on water quality than the measures proposed for construction under Alternative 1 because similar construction equipment would be used.

The project proponents would adhere to environmental commitments of the SWPPP, the SPCCP, and the BSSCP, as summarized under Effects WQ-1 and WQ-2 in the Alternative 1 discussion above. Adherence to the environmental commitments and implementation of Mitigation Measure WQ-MM-1 would reduce Effect WQ-3 to a less-than-significant level.

Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment

Effects on groundwater and drinking water quality from operation and construction might be significant if drinking water wells are located in close proximity to construction zones where a slurry cutoff wall is being considered because the cutoff wall may block lateral water transfer from the river to the aquifer. In addition, if local drinking water or agricultural wells are affected by cutoff walls, water quality may be affected because the well pump may take in more sediment due to the potential lowering of the aquifer. As stated in Effect WQ-4 under Alternative 1, the model prepared by HDR estimated a 3-foot change in groundwater levels in the southern portion of the planning area, which is the largest change in the entire planning area. Such change is not anticipated to be a significant effect on groundwater levels. This effect is considered less than significant. No mitigation is required.

3.2.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on water quality and groundwater resources. These potential effects and related mitigation measure requirements are summarized in Table 3.2-7 and discussed below.

Table 3.2-7. Water Quality and Groundwater Resources Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids	Less than significant	None required	Less than significant
Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials	Less than significant	None required	Less than significant
Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table	Significant	WQ-MM-1: Implement Provisions for Dewatering	Less than significant
Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment	Less than significant	None required	Less than significant

Effect WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids

Construction of Alternative 3 involves all the measures under Alternative 1, in addition to stability berms, relief wells, and canal hydration. It is not anticipated that construction of a stability berm, canal hydration, or relief wells would have any greater effect on turbidity, total suspended

sediments or total mercury concentrations~~water quality~~ than the measures proposed under Alternative 1.

Implementation of the environmental commitments detailed in Effect WQ-1 and Chapter 2, *Alternatives*, would ensure that water quality is protected from excessive turbidity and TSS from the construction measures proposed under this alternative. No mitigation is required.

Effect WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials

Construction practices occurring under this alternative would be similar to those occurring under Alternative 1 with the addition of stability berms, relief wells, and canal hydration. It is not anticipated that construction under this alternative would have any greater effect on water quality than the measures proposed for construction under Alternative 1 because similar construction equipment would be used.

However, implementation of the environmental commitments detailed in Effect WQ-1, Effect WQ-2, and discussed in more detail in Chapter 2, *Alternatives*, would ensure that water quality is protected from construction-related hazardous materials. No mitigation is required.

Effect WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table

Construction practices occurring under this alternative would be similar to those occurring under Alternative 1 with the addition of stability berms, relief wells, and canal hydration. It is not anticipated that construction under this alternative would have any greater effect on water quality than the measures proposed for construction under Alternative 1 because similar construction equipment would be used.

The project proponents would adhere to environmental commitments of the SWPPP, the SPCCP, and the BSSCP, as summarized under Effects WQ-1 and WQ-2 in the Alternative 1 discussion above. Adherence to those environmental commitments and implementation of Mitigation Measure WQ-MM-1 would reduce Effect WQ-3 to a less-than-significant level.

Effect WQ-4: Effects on Groundwater Wells Due to Project Encroachment

Effects on groundwater and drinking water quality from operation and construction might be significant if drinking water wells are located in close proximity to construction zones where a slurry cutoff wall (or relief well and canal hydration) is being considered, because the cutoff wall may block lateral water transfer from the river to the aquifer and relief wells may dewater from the ground. In addition, if local drinking water or agricultural wells are affected by cutoff walls, water quality may be affected because the well pump may take in more sediment due to the potential lowering of the aquifer. As stated in Effect WQ-4 under Alternative 1, the model prepared by HDR estimated a 3-foot change in groundwater levels in the southern portion of the planning area, which is the largest change in the entire planning area. Such change is not anticipated to be significant effect on groundwater levels. This effect is considered less than significant. No mitigation is required.

3.3 Geology, Soils, Seismicity, and Mineral Resources

3.3.1 Introduction

This section describes the regulatory and environmental setting for geology, soils, seismicity, and mineral resources; effects caused by or on geology, soils, seismicity, and mineral resources that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects. Additional information on the geology of the area is provided in Appendix C.

3.3.2 Affected Environment

This section describes the affected environment for geology, soils, seismicity, and mineral resources in the project area. The key sources of data and information used in the preparation of this section are listed below.

- Geologic map of late Cenozoic deposits of the Sacramento Valley and northern Sierran foothills, California (Helley and Harwood 1985).
- Memoranda prepared by William Lettis & Associates~~WLA~~, "Surficial Geologic Maps and Geomorphic Assessment of the Sutter Study Area, Urban Levee Geotechnical Evaluation, Sutter and Butte Counties, California," which were included in the SGDR as Appendix O (URS 2010).
- Technical Memorandum, SBFCA, Feather River West Levee Project, Preliminary Assessment of Borrow Requirements and Potential Borrow Sites (Wood Rodgers 2011).

3.3.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to geology, soils, seismicity, and mineral resources. Additional regulatory information appears in Appendix A.

Federal

Clean Water Act

As introduced in Section 3.2, *Water Quality and Groundwater Resources*, CWA Section 402 regulates discharges to surface waters through the NPDES program, administered by EPA. In California, the State Water Board is authorized by EPA to oversee the NPDES program through the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. A SWPPP and PPMP may be required for construction of the FRWLP to comply with the Construction General Permit and General Dewatering Permit, respectively, under Section 402.

State

Alquist-Priolo Earthquake Fault Zoning Act and Seismic Hazards Mapping Act

California's Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (Public Resources Code [PRC] Section 2621 et seq.) and the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) are intended to reduce damage resulting from earthquakes.

California Building Standards Code

California's minimum standards for structural design and construction are given in the California Building Standards Code (CBSC) (24 CCR). The CBSC provides standards for various aspects of construction, including excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, certain aspects of the project would be required to comply with all provisions of the CBSC.

California Surface Mining and Reclamation Act of 1975

The principal legislation addressing mineral resources in California is the Surface Mining and Reclamation Act of 1975 (SMARA) (PRC Sections 2710–2719), which was enacted to provide a comprehensive surface mining and reclamation policy that would encourage the production and conservation of mineral resources while ensuring that adverse environmental effects of mining are prevented or minimized; that mined lands are reclaimed and residual hazards to public health and safety are eliminated; and that consideration is given to recreation, watershed, wildlife, aesthetic, and other related values. Although the State of California is responsible for identifying areas containing mineral resources, the county or city is responsible for SMARA implementation and enforcement by providing annual mining inspection reports and coordinating with California Geological Survey (CGS).

Mining activities that disturb more than 1 acre or 1,000 cubic yards of material require a SMARA permit from the lead agency, which is the county, city, or board that is responsible for ensuring that adverse environmental effects of mining are prevented or minimized. The lead agency establishes its own local regulations and requires a mining applicant to obtain a surface mining permit, submit a reclamation plan, and provide financial assurances, pursuant to SMARA.

Certain mining activities do not require a permit, such as excavation related to farming, grading related to restoring the site of a natural disaster, and grading related to construction.

Local

Sutter County, Butte County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley have each adopted policies related to seismic safety, geologic hazards, erosion and siltation control, and soil and mineral resource conservation, detailed in Appendix A.

3.3.2.2 Environmental Setting

The following considerations are relevant to geology, soils, seismicity, and mineral resources conditions in the project area.

This section discusses the environmental setting as of February 2012 related to geology, soils, seismicity, and mineral resources in the project area. The project area is located in Sutter and Butte Counties. It covers about 326 square miles and is about 43 miles long, north to south and up to 14 miles wide east to west (Plate 1-1). It is roughly bounded by the Feather River (to the east), Cherokee Canal, the Sutter Buttes, and Sutter Bypass (to the west, listed from north to south). Floodwaters potentially threatening the project area originate from the Feather River watershed or the upper Sacramento River watershed, above Colusa Weir. These waterways have drainage areas of 5,921 and 12,090 square miles, respectively. In addition to Yuba City, communities in the project area include Biggs, Gridley, Live Oak, and Sutter. The term *project corridor* refers to the corridor along the west levee of the Feather River from Thermalito Afterbay on the north to the Sutter Bypass on the south. This corridor is roughly 500 feet toward the land side of the existing levees and 100 feet toward the water side and approximately 41 miles long (Plate 1-3).

Geology and Seismicity

Regional Geology

The project area is located in the central portion of the Sacramento Valley, which forms the northern portion of California's Great Valley geomorphic province (Norris and Webb 1990:412; California Geological Survey 2002:2).

The Great Valley, also called the Central Valley, is a nearly flat alluvial plain that lies between the Sierra Nevada on the east and the Coast Ranges on the west. Its south end is defined by the Tehachapi Mountains north of Los Angeles, and its north end is defined by the Klamath Mountains. Subdivided into the Sacramento Valley to the north and the San Joaquin Valley to the south, the valley has an average width of about 50 miles and is about 400 miles long overall (Norris and Webb 1990:412–417; Bartow 1991:1).

The Great Valley is floored by a thick sequence of sedimentary deposits that range in age from Jurassic through Quaternary. Under the eastern and central portions of the valley, the base of the sequence likely rests on Mesozoic crystalline rock allied to the plutons of the Sierra Nevada; to the west, basement rocks are believed to be Franciscan metasediments and/or mélange similar to exposures in the Coast Ranges. Mesozoic sedimentary rocks now in the subsurface record marine deposition. They are overlain by Tertiary strata reflecting marine, estuarine, and terrestrial conditions, which are in turn overlain by Quaternary fluvial and alluvial strata, recording uplift and erosion of the Sierra Nevada and Coast Ranges to approximately their present shape (Norris and Webb 1990:412–419; Bartow 1991:1).

Local Geology

The description of the local geology presented here is a summary of regional mapping done by Helley and Harwood (1985) and detailed mapping done by WLA in a series of technical memoranda that were included in the SGDR (URS 2010) as Appendix O, "Surficial Geologic Maps and Geomorphic Assessment of the Sutter Study Area, Urban Levee Geotechnical Evaluation, Sutter and Butte Counties, California." The WLA report is included in Appendix C, and reference to more detailed map units in that report are included here. In particular, WLA focused on more detailed mapping of late Holocene alluvium and geomorphic features.

The descriptions of geologic units below are presented in order of age from oldest to youngest and are shown in Plate 3.3-1.

Tuff Breccia: The Pliocene-Pleistocene tuff breccia (QTm) is made up of consolidated coarse material derived from the volcanic rocks of the Sutter Buttes. It occurs as a ring around the Sutter Buttes.

Riverbank Formation: The Quaternary Riverbank Formation (lower and upper members, Qrl and Qru) is made up of fan deposits formed from alluvium from the Sutter Buttes and Sierra Nevada during the late to middle Pleistocene (about 130,000 to 450,000 years ago). The Riverbank Formation is semi-consolidated, and its upper surface is marked by a soil hardpan (or duripan) layer that formed when the unit was an exposed land surface, and which was later covered by younger deposits. The Riverbank occurs in the shallow subsurface in much of the project area and is exposed near East Biggs.

Modesto Formation: The late Pleistocene Modesto Formation is divided into a lower (older) unit (42,000 to 29,000 years old, Qml) and an upper (younger) unit (24,000 to 12,000 years old, Qmu) (Helley and Harwood 1985). The lower unit consists of unconsolidated, slightly weathered gravel; sand; silt; and clay. The upper unit consists of sand, silt, and some gravel and has a moderate amount of secondary (pedogenic) clay accumulation. The Modesto Formation occurs in the project area along the margins of the Feather River and in a wide half-ring around the Sutter Buttes beyond the tuff breccia.

Basin, alluvial, and marsh deposits: The Holocene (less than 11,000 years old) basin and alluvial deposits (Qb; Qn in Appendix C) are widespread throughout the project area, are 4–8 feet thick, and overlie the Modesto Formation. Undifferentiated Quaternary alluvium (Qa; Qa or Ha in Appendix C) occurs along the Sutter Bypass and Feather River. Around the southwestern Sutter Buttes, this Holocene alluvium is mapped at the surface as alluvial-fan deposits, which likely consist of poorly sorted mixtures of fine gravel, sand, and silt derived from the volcanic rocks of the Buttes. The Quaternary marsh (Qm; Qs in Appendix C) deposits occur between the levees of the Sutter Bypass and are made up of fine-grained deposits. WLA distinguished these deposits from basin deposits because they were generally underwater or had standing water in historical 1937 photographs that were studied as part of their mapping.

Alluvial channels: Not mapped at the regional scale are the Holocene alluvial channels (Hch in Appendix C), which occur as a network of moderately sinuous channels with southwesterly orientations. The lower portions of the deposits are made up of relatively loose, coarse sand that fines upward into fine-grained silt and clay.

Historical alluvial channels: Also not mapped at the regional scale are the historical alluvial channels, which are less than 150 years old (Rch in Appendix C) and also occur as a network of moderately sinuous channels with southwesterly orientations.

Seismicity

The project area is located in a region of California characterized by relatively low seismic activity. The Uniform Building Code (UBC) recognizes no active seismic sources in the vicinity of the project area (International Conference of Building Officials 1997), and no active faults are known to cross the project area.

Primary Seismic Hazards

The State of California considers two aspects of earthquake events as primary seismic hazards: surface fault rupture (disruption at the ground surface as a result of fault activity) and seismic ground shaking.

Surface Fault Rupture

The project area is not located in an Alquist-Priolo Earthquake Fault Zone (Bryant and Hart 2007; California Division of Mines and Geology 2001), and no active faults were identified during the geologic evaluation (Jennings and Bryant 2010; U.S. Geological Survey 2009; International Conference of Building Officials 1997; California Geological Survey 2010a); therefore, the risk of surface fault rupture at the project area is considered low. The nearest active faults are the Foothills Fault System (northern reach section, Cleveland Hill fault), located 9 miles east of the project area, and the Green Valley fault zone (Green Valley fault), located 55 miles southwest of the project area (Plate 3.3-2).

Strong Ground Shaking

Unlike surface rupture, ground shaking is not confined to the trace of a fault but, rather, propagates into the surrounding areas during an earthquake. The intensity of ground shaking typically diminishes with distance from the fault, but ground shaking may be locally amplified and/or prolonged by some types of substrate materials.

Based on a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10% probability in 50 years (California Geological Survey 2007b; Cao et al. 2003), the probabilistic peak horizontal ground acceleration values for the project area are 0.1 to 0.2g (where g equals the acceleration of gravity) (Plate 3.3-3). As a point of comparison, probabilistic peak horizontal ground acceleration values for the San Francisco Bay Area range from 0.4g to more than 0.8g. This indicates that the ground-shaking hazard in the project area is low. Farther to the west, the ground shaking hazard increases, coinciding with the increase in abundance of associated faults and fault complexes (California Geological Survey 2007b; Cao et al. 2003).

Seismic deformation analyses were conducted for the project area to determine the amount of deformation that could occur during an earthquake and the post seismic ~~flood protection~~level of performance that the levees would provide. The study used expected earthquake magnitudes (Mw) associated with the three return period events (Mw of 6.5 for 100-year return period event, Mw of 7.0 for 200-year return period event, and Mw of 8.0 for 500-year return period) and typical winter conditions (mean February water levels). Results of the study indicate that strong ground shaking would not compromise most levee reaches but some levee reaches could experience offset of up to 4.3 feet and a few could experience flow conditions (URS 2008:5-38–5-53).

Secondary Seismic Hazards

Secondary seismic hazards refers to seismically induced landsliding, liquefaction,[1] and related types of ground failure. As discussed in Section 3.3.2.1, *Regulatory Setting*, the State of California maps

[1] Liquefaction is a phenomenon in which the strength and stiffness of a soil are reduced by earthquake shaking or other rapidly applied loading. Liquefaction and related types of ground failure are of greatest concern in areas where well-sorted, sandy, unconsolidated sediments are present in the subsurface and the water table is comparatively shallow.

areas that are subject to secondary seismic hazards pursuant to the Seismic Hazards Mapping Act of 1990. The State of California has not yet published seismic hazard mapping in Sutter or Butte Counties under the Seismic Hazards Mapping Program (California Geological Survey 2009). These hazards are addressed briefly below based on available information.

Landslide and Other Slope Stability Hazards

Most of the project area is located on very gentle valley floor topography. Consequently, the potential for slope failure, including seismically induced landsliding, is low (Butte County 2010:295; City of Yuba City 2004:9–11).

There is the potential for slope instability associated with the levees in the project area. See Section 3.1, *Flood ~~Control~~ Risk Management and Geomorphic Conditions*, for further information on levee stability.

Liquefaction

Liquefaction is the process in which soils and sediments lose shear strength and fail during seismic ground shaking. The vibration caused by an earthquake can increase pore pressure in saturated materials. If the pore pressure is raised to be equivalent to the load pressure, this causes a temporary loss of shear strength, allowing the material to flow as a fluid. This temporary condition can result in severe settlement of foundations and slope failure. The susceptibility of an area to liquefaction is determined largely by the depth to groundwater and the properties (e.g., grain size and density) of the soil and sediment within and above the groundwater. The sediments most susceptible to liquefaction are saturated, unconsolidated sand and silt within 50 feet of the ground surface (California Division of Mines and Geology 1997).

The potential for liquefaction in the project area varies by location. Although sandy units and shallow groundwater occur in much of the project area, particularly near the rivers, the risk of strong ground shaking is low (California Geological Survey 2003; Cao et al. 2003; City of Yuba City 2004:9–11). This condition would suggest a relatively low liquefaction hazard. However, according to the Butte County General Plan, much of the western and southwestern portions of the county have a moderate to high susceptibility to liquefaction.

In addition, geotechnical investigations of project area levees indicate that certain layers in the levees are susceptible to liquefaction. Detailed descriptions of the soil composition of the levees are provided in the Phase 1 Preliminary Geotechnical Evaluation Report (URS 2008:5-40–5-46).

Land Subsidence

Subsidence is the sinking of a large area of ground surface in which the material is displaced vertically downward, with little or no horizontal movement. Many areas in the Central Valley have experienced subsidence, most notably the San Joaquin Valley and Delta (Plate 3.3-4) (Faunt 2009:99). Subsidence occurs in primarily three ways: as a result of groundwater overdraft or oil and gas withdrawal, compaction and oxidation of peat soils, and hydrocompaction (U.S. Geological Survey 2000:1–2). Land subsidence as a result of groundwater overdraft is discussed briefly below. Land subsidence as a result of compaction and oxidation of peat soils and/or hydrocompaction are not significant concerns in the northern Sacramento Valley and are not further discussed.

Land subsidence as a result of groundwater overdraft occurs when excessive groundwater pumping depletes an aquifer and the semi-consolidated sediments of the aquifer collapse together, becoming

compacted. This reduction in pore space (i.e., space between sediments that had been occupied by groundwater) is permanent and cannot be recovered (U.S. Geological Survey 2000:1–2).

The damaging effects of subsidence include gradient changes in roads, streams, canals, drains, sewers, and dikes. Many such systems are constructed with slight gradients and may be significantly damaged by even small elevation changes. Other damaging effects include damage to water wells resulting from sediment compaction and increased likelihood of flooding of low-lying areas (Butte County 2005).

Land subsidence is a potential hazard for the portions of Butte County located in the Sacramento Valley. Areas of potentially significant subsidence are shown in Figure 16-6 of the Butte County General Plan Technical Update, Background Report (Butte County 2005). The greatest potential subsidence areas are those where heavy groundwater withdrawal is occurring and in gas-producing areas. According to investigations by the U.S. Geological Survey (USGS), the areas of heaviest groundwater withdrawal extend about 2 miles north and south of Chico and in a 1-mile radius around Gridley. The amount of subsidence that could take place in the county depends primarily on the amount of groundwater overdraft (Butte County 2005).

Sutter County is not subject to significant subsidence. A number of the previously described factors needed to cause subsidence do not exist in Sutter County. The factors contributing to the low subsidence potential are as follows.

- Although Sutter County does contain several natural gas withdrawal locations in the western and southern portions of the county, these gas fields are spread out over a large area (not producing concentrated drawdowns) and do not individually generate a high volume of gas.
- Although Sutter County does have groundwater drawdowns for domestic and agricultural water supply, the subsurface geology of the county has a significant recharge capability from the Sacramento River, the Feather River ,and runoff from the Sierra Nevada snow melt.
- A large portion of Sutter County households (in Yuba City and Live Oak) do not rely on groundwater because the public water supply is delivered from surface withdrawal off the Feather River.
- Sutter County does not have oil withdrawal drawdowns (Sutter County 1996b*).*

However, Sutter County expects that subsidence could occur during prolonged periods of drought and where there is a significant increase in natural gas withdrawal.

Soils

Because of its large size, many soils occur in the project area; therefore, soil data are presented at the soil association level. Plate 3.3-5 shows the location and extent of the soil associations in the project area, and Table 3.3-1 provides general information on the soil associations. Hydric soils in the project area are addressed in Section 3.8, *Vegetation and Wetlands*.

An issue of concern in the project area is the shrink-swell potential of several of the soil series that make up the soil associations (Butte County 2010:294, 297; Sutter County 1996a:63; Natural Resources Conservation Service 2010a). Soils with a moderate to high shrink-swell potential, also known as expansive soils, expand and contract with changes in moisture content and therefore do not provide a suitable substrate for construction without modification. In the project area, expansive soils tend to occur in basins and basin rims with high clay content in Sutter County (Sutter County

1996a:63) and in level areas in the valley in Butte County. Examples of locations with expansive soils include the Oroville, Biggs, and Gridley areas (Butte County 2010:294, 297).

Table 3.3-1. General Characteristics of Soils in the Project Area

Soil Association	Landform	Typical Surface Layer Texture	Drainage Class	Slope (percent)	Shrink-Swell Potential
Olashes	Alluvial fans and fan terraces	Sandy loam	Very deep well drained	0 to 5	Low to moderate
Redding-Corning	Moderately deep to duripan, soils that formed in alluvium/gravelly alluvium	Gravelly loam	Well or moderately well drained/very deep, well or moderately well drained	0 to 30	Low to high/unknown
San Joaquin	Undulating low terraces	Sandy loam to loam	Well and moderately well drained	0 to 9	Low to high
Stockton-Clear Lake-Capay	Deep to duripan, soils that formed in alluvium/fine textured alluvium/ moderately fine and fine textured alluvium	Clay to clay loam/silty clay to clay/silty clay to clay	Somewhat poorly drained/very deep, poorly drained/very deep, moderately well drained	0 to 2/0 to 2	Unknown/ moderate to high
Stohlman-Palls	Residuum	Stony sandy loam	Well drained	9 to 50/9 to 60	Low
Subaco-Oswald-Gridley	Alluvium	Clay/clay loam	Moderately deep, somewhat poorly drained/moderately deep, poorly drained/ moderately deep, moderately well drained	0 to 2/ less than 1	Low to high/high/low to high
Sycamore-Shanghai-Nueva-Columbia	Alluvium	Silty clay loam/ silt loam/loam/ sandy loam	Very deep, somewhat poorly drained/very deep, somewhat poorly drained/very deep, moderately well drained	Nearly level/ 0 to 2/0 to 2/ 0 to 8	Unknown/low to high/low to moderate/low to high
Tisdale-Kilaga-Conejo	Alluvium	Clay to clay loam/loam to clay/clay loam	Moderately deep, well drained/deep and very deep, well drained/very deep, well drained	0 to 2/0 to 9	Low to moderate/ unknown/low to moderate
Vina-Brentwood	Alluvium/alluvial fans and flood plains	Loam/clay loam	Very deep, well drained/well to moderately well drained	0 to 9	Low/unknown

Source: Compilation of Natural Resources Conservation Service 2010a and 2010b.
Note: Data represent general characteristics and do not apply to every soil map unit in the series.

Mineral Resources

Regional

Mining in the project area dates back to the Gold Rush of the 1800s but is now limited to mainly small aggregate mines. The focus of this section is on aggregate resources, which are the primary mineral resource of economic importance in the project area. Aggregate resources are important because they are necessary for most construction, cannot be replaced with other products, and are most economical when used close to the area where they are mined because of the high cost of transportation (California Geological Survey 2007a:2).

The most notable aggregate production area in the vicinity of the project area is the Yuba-Marysville Production-Consumption (P-C) region, which extends from Marysville east into much of Yuba County (Plate 3.3-6). In all parts of California, except the Yuba-Marysville P-C region (Plate 3.3-7), the 50-year demand for aggregate resources exceeds the permitted aggregate resources. In contrast, the permitted aggregate material in the Yuba-Marysville P-C region exceeds the 50-year demand, and approximately 70% of its supply is exported to nearby counties, such as Sacramento and Placer Counties (California Geological Survey 2006:6).

Natural gas resources also occur and are extracted in the project area, particularly in Sutter County (Sutter County 1996a:50) (California Department of Conservation 2008:66, 2009:1), as do some gold mining operations (Butte County 2010:244). Producing natural gas wells are located primarily on the east side of the project area, predominantly in the vicinity of Sutter Buttes (Plate 3.3-8).

Local

The predominant mineral resources in Butte County are sand and gravel. Current mining activities occur primarily in a gravel belt that runs north–south through the center of the county. The sand and gravel are used, together with Portland cement or asphalt, for construction and road building. Historically, extensive sand and gravel mining also occurred along the Feather River, but most of those operations have ceased (Butte County 2010:243).

The State Geologist has not yet mapped mineral resources in Butte County, but several companies have petitioned to have properties mapped under SMARA. Butte County has three areas designated as mineral resources of statewide or regional importance (Mineral Resource Zone [MRZ] 2) and active aggregate mines (Plates 3.3-6 and 3.3-7). The Martin Marietta Materials Table Mountain Quarry is a basalt mine near Oroville and the M&T Chico Ranch is a previously proposed but nonoperational mine (Butte County 2010:245). The Power House Aggregate Project site was classified as MRZ 2 in December 2010. This site, which is located 7 miles south of Oroville between the east side of the Feather River and SR 70, was classified as MRZ 2 for Portland cement concrete-grade aggregate and contains resources in excess of the threshold value of $17,157,910 (2010 dollars) required for classification as MRZ 2 (State Mining and Geology Board 2010; California Geological Survey 2010b).

The State Geologist has not yet mapped mineral resources in Sutter County and there are no MRZs in the county.

There are no active mines or known minable mineral deposits in the incorporated cities of the project area. In addition, land use conflicts make the startup of new mining operations in urban areas generally unlikely.

3.3.3 Environmental Consequences

This section describes the environmental consequences relating to geology, soils, seismicity, and mineral resources for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.3.3.1 Assessment Methods

This evaluation of geology, soils, seismicity, and mineral resources is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

The following assumptions were made regarding project effects on geology, seismicity, soils and minerals in the project area.

- Fill or borrow material would be obtained from a quarry or other authorized (i.e., permitted) location.
- SBFCA would conform to the latest CBSC standards, city and county standards, and NPDES requirements.
- There are no active faults, potentially active faults, or Alquist-Priolo Earthquake Fault Zones located in or adjacent to the project area.
- The project would be located along the existing levee (i.e., no new alignments).
- No natural gas wells are in or near the construction footprint.
- The borrow excavation sites needed in addition to those listed in the project description would not require a SMARA permit because no royalty fees would be charged (as described in the borrow report [Wood Rodgers 2011]).

For mineral resources, it is important to note the difference between the terms *aggregate* and *borrow* as used in this report.

- The term *aggregate* refers to sand and gravel or crushed stone that meets standard specifications for use in Portland cement concrete or asphalt concrete (California Geological Survey 2006).
- The term *borrow* refers to the materials suitable for use in levee construction. The materials would be low to medium plasticity soils classified (ASTM D 2487) as silty sand and clayey sand, silt, or clay; have a liquid limit less than or equal to 45; have a plasticity index between 8 and 40; have a fines content of 30% or greater; be free from visible organics; and be no greater than 2 inches in any dimension (Wood Rodgers 2011). It is preferable that these would be obtained without royalty fees and therefore without the need for a SMARA.

Table 3.3-2 shows the estimated amount of aggregate and borrow needed for each alternative.

Table 3.3-2. Approximate Borrow and Aggregate Needs by Alternative

Alternative	Borrow Site Excavation (cubic yards)	Aggregate (tons)
1	1,902,150	109,000
2	7,245,200	87,125
3	1,934,400	105,900

Source: HDR and Wood Rodgers 2012.

Note: Excludes materials for through-seepage barrier at four locations, which would be the same under all project alternatives: 5th Street Bridge at station 1007+00 (Reach 16), SR 20 Bridge at station 1131+00 (Reach 18), East Gridley Road at station 1902+00 (transition between Reaches 30 and 31), and the UPRR crossing at station 1131+00 (Reach 18).

3.3.3.2 Determination of Effects

For this analysis, an effect pertaining to geology, seismicity, soils and minerals was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Strong seismic ground shaking.
  - Seismic-related ground failure, including liquefaction.
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
- Be located on expansive soil, creating substantial risks to life or property.
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other lands use plan.

The project area is not in an Alquist-Priolo Earthquake Fault Zone, and no active faults are located in or adjacent to the project area. In addition, the project would not include installation of septic systems or alternative wastewater disposal. Therefore, there is no need to address effects related to these two CEQA criteria.

3.3.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning geology, soils, seismicity, and mineral resources are summarized in Table 3.3-3.

Table 3.3-3. Summary of Effects for Geology, Soils, Seismicity, and Mineral Resources

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect GEO-1: Beneficial Change in Levee Stability	Beneficial	None required	Beneficial
Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking	Less than significant	None required	Less than significant
Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance	Less than significant	None required	Less than significant
Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils	Less than significant	None required	Less than significant
Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow	Less than significant	None required	Less than significant
Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites	Less than significant	None required	Less than significant
Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project	Less than significant	None required	Less than significant
Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project	Less than significant	None required	Less than significant

3.3.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions.

Without levee alternatives, there is the continued risk of levee failure, continued under-seepage and through-seepage, and loss of levee foundation soil. If a levee overtopping or breach were to occur, floodwaters would likely erode topsoil. A catastrophic levee failure could collapse miles of levee slopes, alter regional and local hydrology, and increase erosion and sedimentation. This condition would cause severe damage to soils and cause areas of scour holes, and eroded and unstable landforms. Moreover, subsequent flooding could occur prior to levee repairs that would result in additional erosion and loss of topsoil. It is assumed that these effects would be significant; however, given the uncertainty of the occurrence or magnitude of such an event, the effects cannot be quantified based on available information.

Furthermore, the beneficial effects of project implementation, such as improved levee stability and decreased levee bank erosion, would not be realized under the No Action Alternative.

3.3.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on geology, soils, seismicity, and mineral resources. These potential effects and related mitigation measure requirements are summarized in Table 3.3-4 and discussed below.

Table 3.3-4. Geology, Seismicity, Soils, and Mineral Resources Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect GEO-1: Beneficial Change in Levee Stability	Beneficial	None required	Beneficial
Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking	Less than significant	None required	Less than significant
Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance	Less than significant	None required	Less than significant
Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils	Less than significant	None required	Less than significant
Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow	Less than significant	None required	Less than significant
Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites	Less than significant	None required	Less than significant
Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project	Less than significant	None required	Less than significant
Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project	Less than significant	None required	Less than significant

Effect GEO-1: Beneficial Change in Levee Stability

The proposed slurry cutoff walls and easements under Alternative 1 would improve the stability of the Feather River West Levee by reducing through- and under-seepage and the potential for seepage-related failures by reducing hydrostatic exit gradients (i.e., the average head loss per foot for seepage traveling upward through a blanket layer). These improvements would result in 200-year level of ~~flood protection~~performance in urban areas and 100-year level of ~~flood protection~~performance in rural areas in the project area. These improvements would be a beneficial effect.

Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking

Although the risk of strong ground shaking in the project area is relatively low for California, a large earthquake on a nearby fault could cause ground shaking in the project area that could result in levee deformation, liquefaction, or secondary ground failure, such as, lateral spreading or differential settlement, which could result in structural loss, injury, and death.

Implementation of Alternative 1 would not substantially alter the overall composition of the levees or foundation soils. The risk associated with levee deformation would occur only when river levels were high and the potential for levee failure from ground shaking would depend on the degree of the levee saturation during an earthquake. High water levels and a high level of saturation would likely occur only during a major flood event. The probability that a large regional earthquake would occur during a major flood event is relatively low, but such coincidence is not impossible. In addition, the DWR Interim Levee Design Criteria require that if seismic damage is expected after all

200-year flood rehabilitation measures are in place, a post-earthquake remediation plan would be required for quickly restoring the levee system to a 10-year level of protection. If seismic damage to the levee system would be so significant and widespread that this would be infeasible within a few months, seismic strengthening may be required for 200-year certification. Nonetheless, because of the relatively small likelihood of such coincidental events, and because the expected magnitude of ground shaking from large regional earthquakes is relatively low in the project area, the potential for failure or damage of the slurry cutoff wall is considered less than significant. No mitigation is required.

Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance

The grading, trenching, clearing for slurry batch plant, and other earthwork that would be conducted during construction of Alternative 1 would result in substantial ground and vegetation disturbance. Although Alternative 1 would require the least amount of ground disturbance of all alternatives because it involves moving the least amount of material and has the smallest footprint, ground disturbances would increase the hazard of erosion and could temporarily increase erosion and sedimentation rates above existing levels. Because most of the earthwork would be conducted on and immediately adjacent to the levee, accelerated erosion and sedimentation resulting from construction-related ground and vegetation disturbance would not result in the loss of appreciable quantities of native topsoil resources. In addition, most ground-disturbing activities would occur during the typical construction season, when conditions are generally dry, further reducing the potential for construction-related erosion.

Site-specific measures that would control erosion would be described in more detail in the SWPPP, which is included in the environmental commitments of the proposed project, described in further detail in Section 2.4 of Chapter 2, *Alternatives*, and summarized in Section 3.2, *Water Quality and Groundwater Resources*. The SWPPP is a requirement of the NPDES General Permit.

With implementation of the SWPPP, erosion and sediment-related effects would be less than significant. No mitigation is required.

Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils

According to the Sutter and Butte County general plans (Butte County 2010:294, 297; Sutter County 1996a:63) and the Natural Resources Conservation Service (2010a), soils with moderate to high shrink-swell potential (soil expansiveness) occur in the project area, including the project corridor. If these soils occur in the project corridor or levees, they could lead to levee instability or surface cracking.

The design specifications for the slurry cutoff wall would consider the characteristics of the existing levee materials. During final design, if expansive or weak soils are documented onsite, modifications to the cutoff wall specifications would be made. In addition, materials used to construct the cutoff wall, whether local or imported, would be required to meet strict material specifications (URS 2012). Also, materials used to cap the levees would be required to have a low plasticity so that the material does not crack over time. The effect of expansive soils would therefore be less than significant. No mitigation is required.

Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow

Excavation of borrow material at offsite locations could cause accelerated erosion and loss of topsoil. Alternative 1 would require the least amount of borrow (Table 3.3-2), because it would not involve any levee expansion. As described in Chapter 2, *Alternatives,* SBFCA's first choice for borrow material would be from a local commercial quarry or other permitted source. In the event that material is desired from a source that is not presently permitted, for reasons such as quality, proximity, or volume available, SBFCA would implement soil supply protection measures, such as maximizing onsite use through gradation, placement, and treatment and preserving and replacing topsoil at borrow sites, so that they could be continued to be used for their current use or otherwise returned to their pre-project condition. As part of borrow operations, the upper 12 inches of topsoil would be set aside and replaced after project construction in each construction season. After the project is completed, the borrow site would be re-contoured and reclaimed. If necessary, an additional measure would be independent environmental documentation and regulatory compliance, as required. Specific regulations related to soil resources are detailed in Section 3.3.2.1, *Regulatory Setting*. Project design would reduce effects to a less-than-significant level. No mitigation is required.

Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites

Excavation of borrow material could result in failure of cut slopes, potentially causing injury or death of workers at the construction sites. Soils and sediments, especially those consisting of loose alluvium, would be particularly prone to failure and movement.

Excavations in borrow areas would be designed to avoid excessive ground movements on adjacent areas and areas would be free draining after excavation (i.e., no standing water at the bottom of the excavation).

SBFCA would ensure that geotechnical design recommendations are included in the design of project facilities and construction specifications to minimize the potential effects from failure of excavations. SBFCA would also ensure that the design specifications are properly executed and that all California Division of Occupational Safety and Health regulations are followed during construction.

Adherence to these and other applicable design specifications and standards would ensure that the hazard of failure of excavations and settlement would be controlled to a safe level. This effect would be less than significant. No mitigation is required.

Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project

Construction of Alternative 1 would require large amounts of aggregate[2] (Table 3.3-2), including important mineral resources like bentonite for the slurry cutoff wall and aggregate base rock for the top of the levee surface. Because aggregate is an important building material, and its availability can affect a region's potential for development. However, the project area is located in a region with a permitted aggregate supply that exceeds its expected need over the next 50 years. The amount of aggregate needed for the project is therefore not expected to substantially affect the availability of

[2] Borrow is not considered a mineral resource because it does not fall under SMARA.

this resource. In addition, bentonite is not a locally mined mineral resource. This effect is therefore less than significant. No mitigation is required.

Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project

The placement of a structure can preclude the mining of a local mineral, making that mineral resource unavailable if the land uses are incompatible. However, the project does not propose construction of new levees and would not interfere with access to permitted mineral resources. In addition, there are no permitted mineral resource extraction mines or MRZs in the project corridor. There would therefore be no effect on the availability of aggregate resources. No mitigation is required.

3.3.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on geology, soils, seismicity, and mineral resources. These potential effects and related mitigation measure requirements are summarized in Table 3.3-5 and discussed below.

Table 3.3-5. Geology, Seismicity, Soils, and Mineral Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect GEO-1: Beneficial Change in Levee Stability	Beneficial	None required	Beneficial
Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking	Less than significant	None required	Less than significant
Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance	Less than significant	None required	Less than significant
Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils	Less than significant	None required	Less than significant
Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow	Less than significant	None required	Less than significant
Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites	Less than significant	None required	Less than significant
Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project	Less than significant	None required	Less than significant
Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project	Less than significant	None required	Less than significant

Effect GEO-1: Beneficial Change in Levee Stability

The proposed combination of seepage and stability berms, shallow cutoff wall, infilling of the canal adjacent to portions of the levee, and relief wells under Alternative 2 would improve the stability of the Feather River West Levee by reducing through- and under-seepage and improving levee geometry. As with Alternative 1, these improvements would result in 200-year level of ~~flood~~

~~protection~~performance in urban areas and 100-year level of ~~flood protection~~ performance in rural areas in the project area. These improvements would be a beneficial effect.

Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking

Although the risk of strong ground shaking in the project area is relatively low for California, a large earthquake on a nearby fault could cause ground shaking in the project area that could cause levee deformation, liquefaction, or secondary ground failure, such as, lateral spreading or differential settlement, which could result in structural loss, injury, and death.

The effects related to ground shaking under Alternative 2 would be similar to those of Alternative 1, in that neither would affect the overall composition of the existing levee or foundation soils. However, the seepage and stability berms would add greater mass to the levee, which could make it more resistant to deformation. In addition, the materials used in these berms would be less susceptible to ground failure because they would be designed to modern building codes. The effect would be less that significant. No mitigation is required.

Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance

The grading, trenching, clearing for slurry batch plant, and earthwork associated with building the seepage and stability berms that would be conducted during construction of Alternative 2 would result in substantial ground and vegetation disturbance. Alternative 2 would likely require the greatest amount of ground disturbance of all project alternatives because it has the largest construction footprint as a result of the seepage and stability berms. As with Alternative 1, these ground disturbances would increase the hazard of erosion and could temporarily increase erosion and sedimentation rates above existing levels. Although these effects would be of a greater magnitude than under Alternative 1, because of the project design they would be less than significant. No mitigation is required.

Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils

The effects related to expansive soil under Alternative 2 would be similar to those described for Alternative 1. As with Alternative 1, design specifications would take into consideration the existing levee materials. The effect of expansive soils would be less than significant. No mitigation is required.

Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow

The effects related to accelerated erosion and loss of topsoil under Alternative 2 would be similar to those described for Alternative 1 but of greater magnitude because more borrow would be required (Table 3.3-2). Alternative 2 would require the greatest amount of borrow because it would involve seepage and stability berms. Although Alternative 2 would require the use of more borrow materials, project design would reduce effects to a less-than-significant level. No mitigation is required.

Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites

The effects related to slope failure at borrow sites under Alternative 2 would be similar to those described for Alternative 1 but of greater magnitude. As with Alternative 1, adherence to applicable design specifications and standards would ensure that the hazard of failure of excavations and settlement would be controlled to a safe level. This effect would be less than significant. No mitigation is required.

Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project

The effects related to loss of important mineral resources as a result of construction under Alternative 2 would be the same as described for Alternative 1 but of lesser magnitude because less aggregate would be required (Table 3.3-2). This effect would be less than significant. No mitigation is required.

Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project

The effects related to loss of important mineral resources as a result of placement of Alternative 2 would be the same as described for Alternative 1. This effect would be less than significant. No mitigation is required.

3.3.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on geology, soils, seismicity, and mineral resources. These potential effects and related mitigation measure requirements are summarized in Table 3.3-6 and discussed below.

Table 3.3-6. Geology, Seismicity, Soils, and Mineral Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect GEO-1: Beneficial Change in Levee Stability	Beneficial	None required	Beneficial
Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking	Less than significant	None required	Less than significant
Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance	Less than significant	None required	Less than significant
Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils	Less than significant	None required	Less than significant
Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow	Less than significant	None required	Less than significant
Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites	Less than significant	None required	Less than significant
Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project	Less than significant	None required	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project	Less than significant	None required	Less than significant

Effect GEO-1: Beneficial Change in Levee Stability

The combination of proposed levee improvement measures under Alternative 3 would improve the stability of the Feather River West Levee by reducing through- and under-seepage and improving levee geometry. As with Alternatives 1 and 2, these improvements would result in 200-year level of ~~flood protection~~performance in urban areas and 100-year level of performance~~flood protection~~ in rural areas in the project area. These improvements would be a beneficial effect.

Effect GEO-2: Increase Exposure of People or Structures to Hazards Related to Strong Seismic Ground Shaking

The effects related to risk of strong ground shaking under Alternative 3 would be the same as those described for Alternatives 1 and 2. The effect would be less that significant. No mitigation is required.

Effect GEO-3: Cause Accelerated Erosion and Sedimentation Resulting from Construction-Related Ground Disturbance

The effects related to accelerated erosion and sedimentation under Alternative 3 would be the same as those described for Alternatives 1 and 2. As under Alternatives 1 and 2, because of the project design effects under Alternative 3 would be less than significant. No mitigation is required.

Effect GEO-4: Cause Structural Damage and Injury Resulting from Development on Expansive Soils

The effects related to expansive soil under Alternative 3 would be similar to those described for Alternatives 1 and 2. As with those alternatives, design specifications would take into consideration the existing levee materials. The effect of expansive soils would be less than significant. No mitigation is required.

Effect GEO-5: Cause Accelerated Erosion and Sedimentation Resulting from Use of Imported Borrow

The effects related to accelerated erosion and loss of topsoil under Alternative 3 would be similar to those described for Alternatives 1 and 2. Alternative 3 would require slightly more borrow than Alternative 1 but significantly less than Alternative 2 (Table 3.3-2). Project design would reduce effects to a less-than-significant level. No mitigation is required.

Effect GEO-6: Loss, Injury, or Death from Slope Failure at Borrow Sites

The effects related to slope failure at borrow sites under Alternative 3 would be the same as those described for Alternatives 1 and 2. As with those alternatives, adherence to applicable design specifications and standards would ensure that the hazard of failure of excavations and settlement would be controlled to a safe level. This effect would be less than significant. No mitigation is required.

Effect GEO-7: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Construction of Proposed Project

The effects related to loss of important mineral resources as a result of construction under Alternative 3 would be the same as described for Alternatives 1 and 2 because similar amounts of aggregate would be required (Table 3.3-2). This effect would be less than significant. No mitigation is required.

Effect GEO-8: Cause the Loss of a Known Mineral Resource of Regional or Local Importance as a Result of Placement of Proposed Project

The effects related to loss of important mineral resources as a result of placement of Alternative 3 would be the same as described for Alternatives 1 and 2. This effect would be less than significant. No mitigation is required.

3.4 Traffic, Transportation, and Navigation

3.4.1 Introduction

This section describes the regulatory and environmental setting for traffic, transportation, and navigation; effects on traffic, transportation, and navigation that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.4.2 Affected Environment

This section describes the affected environment for traffic, transportation, and navigation in the project area. The key sources of data and information used in the preparation of this section are listed below.

- Butte County General Plan 2030 (Butte County 2010).
- Butte County General Plan Draft EIR (Butte County 2010b).
- California Department of Transportation (Caltrans) Traffic and Vehicle Data Systems Unit, 2010 All Traffic Volumes on CSHS (California Department of Transportation 2010a).
- City of Biggs General Plan 1997–2015 (City of Biggs 1998).
- City of Gridley 2030 General Plan (City of Gridley 2010).
- City of Live Oak 2030 General Plan (City of Live Oak 2010).
- City of Yuba City General Plan (City of Yuba City 2004).
- Sutter County General Plan Update Technical Background Report (Sutter County 2008).
- Sutter County General Plan (Sutter County 2011).

3.4.2.1 Terminology

Following are definitions of key traffic and transportation terms used in this section.

- **Level of service (LOS):** A scale used to determine the operating quality of a roadway segment or intersection based on volume-to-capacity (V/C) ratios or average delay experienced by vehicles on the facility. The levels range from A to F with LOS A representing free-flow traffic and LOS F representing severe traffic congestion. Agencies adopt LOS standards that define the level of operations that are acceptable within their jurisdictions.
- **V/C ratio:** The number of vehicles that travel on a transportation facility divided by the vehicular capacity of that facility (the number of vehicles the facility was designed to convey).
- **Delay:** The additional travel time experienced by a vehicle or traveler because of inability to travel at optimal speed and/or stops due to congestion or traffic control.
- **Average daily traffic (ADT):** Average traffic volume on a roadway section during a typical 24-hour day.

3.4.2.2 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to traffic, transportation, and navigation. Additional regulatory information appears in Appendix A.

Federal

Federal Highway Administration standards are implemented in California by Caltrans, which is responsible for planning, designing, constructing, operating, and maintaining all state-owned roadways in the planning area. Caltrans also enforces various policies and regulations related to the modification of, or encroachment on, state-owned roadways.

River and Harbors Appropriation Act of 1899

The River and Harbors Appropriation Act of 1899 addresses activities that involve the construction of dams, bridges, dikes, and other structures that cross any navigable water; that place obstructions to navigation outside established Federal lines; and that excavate from or deposit material in such waters. Such activities require permits from USACE. *Navigable waters* are defined in Section 329.4 as:

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

In USACE Sacramento District, navigable waters of the United States in the project vicinity that are subject to the requirements of the River and Harbors Appropriation Act include the Feather River from its mouth to the railroad bridge at Marysville (U.S. Army Corps of Engineers 2003). The section of the River and Harbors Act applicable to the proposed project is summarized below.

Section 10

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

State

Federal highway standards are implemented in California by Caltrans, which is responsible for planning, designing, constructing, operating, and maintaining all state-owned roadways in the planning area. Caltrans enforces various policies and regulations related to the modification of, or encroachment on, state-owned roadways.

Caltrans Route Concept Reports

Caltrans has completed route concept reports for SR 20 and SR 99. These reports identify long-range improvements and establish the "concept"—or desired—LOS for specific corridor segments. These reports identify long-range improvements needed to bring the existing facilities up to the expected standards needed to adequately serve 20-year traffic forecasts. Additionally, the reports identify the

ultimate design concept for conditions beyond the immediate 20-year design period (California Department of Transportation 2009, 2010b).

Local

Transportation analysis in the affected area is guided by policies and standards set by local jurisdictions. Because the affected area is located in Sutter and Butte Counties, planning would adhere to the adopted county and city transportation policies in the respective general plans. A summary of the goals and policies adopted by Sutter County, Butte County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley in relation to transportation is provided in Appendix A.

LOS is a measure by which the quality of service on roads or intersections is determined and classified. Table 3.4-1 provides definitions for each level of service used in the affected area.

Table 3.4-1. Level of Service Definitions

Level of Service	Definition
A	Complete free flow.
B	Free flow, presence of other vehicles noticeable.
C	Ability to maneuver and select operating speed affected.
D	Unstable flow, speeds, and ability to maneuver restricted.
E	At or near capacity, flow quite unstable.
F	Forced flow, breakdown.

3.4.2.3 Environmental Setting

This section discusses the existing conditions related to traffic in the project area, as well as roadways that may provide access to the project area during construction. The project area is bounded by the Feather River to the east and a 500-foot buffer from the Feather River levee to the west. The area is predominantly rural with agricultural uses.

Roadways

Butte County

The Butte County portion of the project area is served primarily by rural roadways. SR 99 is the main highway that provides access to the project area, running north/south to the west of the project area. The highway segments that may provide access to the project area are listed in Table 3.4-2 with their roadway type, ADT, and LOS.

Table 3.4-2. Butte County Highway Segments that Provide Access to the Project Area

Road	From	To	Roadway Type	ADT	LOS
SR 99	Sutter County Line	Live Oak Gridley Road	Two-lane arterial	14,900	D
	Live Oak Gridley Road	Archer Avenue	Two -lane arterial	18,100	E
	Archer Avenue	Wilson Street	Four-lane undivided arterial	18,500	D
	Wilson Street	Spruce Street	Four-lane undivided arterial	22,200	D
	Spruce Street	East Biggs Highway	Major two-lane highway	14,500	D
	East Biggs Highway	Junction Route 162 West	Major two-lane highway	10,900	D
	Junction Route 162 West	Junction Route 162 East	Major two-lane highway	10,700	D
	Junction Route 162 East	Study area boundary	Major two-lane highway	10,000	D

Source: California Department of Transportation 2010a.
ADT = average daily traffic; LOS = level of service; SR = State Route.

County and local roads that would provide access to the project area are listed in Table 3.4-3. Butte County does not have LOS A and LOS B thresholds for arterial roads; accordingly, LOS C is the best LOS designation provided.

Table 3.4-3. County and Local Roads in Butte County that Provide Access to the Project Area

Road	From	To	Roadway Type	ADT	LOS
East Biggs Highway	Biggs	SR 99	Two-lane arterial	2,000	C
	SR 99	Larkin Road	Two-lane arterial	2,500	C
East Gridley Road	SR 99	Larkin Road	Two-lane arterial	5,510	C
	Larkin Road	SR 70	Two-lane arterial	5,500	C
Larkin Road	SR 162	East Hamilton Road	Two-lane arterial	3,580	C
	East Hamilton Road	East Biggs Highway	Two-lane arterial	1,000	C
	East Biggs Highway	Gridley Highway	Two-lane arterial	500	C
	Gridley Highway	East Evans Reimer Road	Two-lane arterial	2,500	C

Source: Butte County 2010b.
ADT = average daily traffic; LOS = level of service; SR = State Route.

Local roads in Butte County that would provide access to the project area but have no traffic data available include Chandon Avenue, Campbell Avenue, East Evans Reimer Road, Richards Avenue, Kirk Road, Keifer Avenue, East Gridley Road, Almond Avenue, Palm Avenue, Cherry Avenue, Vance Avenue, and two unnamed roads.

Sutter County

The Sutter County portion of the project area is served by a system of primarily rural roadways. SR 99 is the main highway that serves the project area, with SR 20 also providing access. SR 99 runs primarily north/south to the west of the project area, and SR 20 runs east/west through Yuba City. The highway segments that may provide access to the project area are listed in Table 3.4-4 with their roadway type, ADT, and LOS. All highway segments in the Sutter County portion of the project area have an LOS standard of E. As Sutter County does not provide LOS thresholds for A and B, highway segments with an LOS better than C are designated A/B.

Table 3.4-4. Sutter County Highway Segments that Provide Access to the Project Area

Road	From	To	Roadway Type	ADT	LOS
SR 20	Junction SR 99	Live Oak Boulevard	Four-lane expressway	41,750	C
	Live Oak Boulevard	Plumas Street	Four-lane expressway	43,000	D
	Plumas Street	Sutter Street	Four-lane expressway	38,000	C
	Sutter Street	Yuba County Line	Four-lane expressway	41,000	C
SR 99	Garden Highway	Sacramento Avenue	Four-lane expressway	16,100	A/B
	Sacramento Avenue	Tudor Road/Garden Highway	Four-lane expressway	15,800	A/B
	Tudor Road/Garden Highway	Junction SR 113	Four-lane expressway	13,200	A/B
	Junction SR 113	Oswald Road	Four-lane expressway	15,400	A/B
	Oswald Road	Barry Road	Four-lane expressway	17,200	A/B
	Barry Road	Bogue Road	Four-lane expressway	18,500	A/B
	Bogue Road	Lincoln Road	Four-lane expressway	23,200	A/B
	Lincoln Road	Franklin Road	Four-lane expressway	29,000	A/B
	Franklin Road	Bridge Street	Four-lane expressway	33,000	C
	Bridge Street	Onstott Road	Four-lane expressway	29,500	C
	Onstott Road	Junction SR 20	Four-lane expressway	29,500	C
	Junction SR 20	Queens Avenue	Four-lane freeway	20,500	A/B
	Queens Avenue	Eager Road	Four-lane freeway	19,400	A/B
	Eager Road	End of freeway	Four-lane freeway	17,000	A/B
	End of freeway	Encinal/Live Oak Boulevard	Two-lane rural	17,000	E
	Encinal/Live Oak Boulevard	Pennington Road	Two -lane rural	19,200	E
	Pennington Road	Live Oak City Limit	Two-lane rural	18,700	E
	Live Oak City Limit	Butte County Line	Two-lane rural	14,900	D

Source: California Department of Transportation 2010a.
ADT = average daily traffic; LOS = level of service; SR = State Route.

County and local roads that would provide access to the project area are listed in Table 3.4-5. As Sutter County does not provide LOS thresholds for A and B, road segments with an LOS better than C are designated A/B. As noted in the table, some ADTs are from the City of Yuba City General Plan.

Table 3.4-5. County and Local Roads in Sutter County that Provide Access to the Project Area

Road Name	From	To	Roadway Type	ADT	LOS
2nd Street	B Street	Franklin Road	Two-lane minor arterial	13,240*	C*
Bogue Road	SR 99	Railroad Avenue	Two-lane rural collector	5,860*	B*
Bridge Street	Clark Avenue	Plumas Street	Two-lane major arterial	18,130*	C*
	East of 2nd Street	Twin Cities Bridge	Two-lane minor arterial	22,000*	F*
Franklin Road	Gray Avenue	Clark Avenue	Two-lane minor arterial	12,920*	C*
	Park Avenue	Percy Avenue	Two-lane minor arterial	8,320*	B*
Garden Highway	Stewart Road	Messick Road	Two-lane rural collector	5,230	A/B
	Messick Road	O'Banion Road	Two-lane rural collector	4,290	A/B
	O'Banion Road	SR 99	Two-lane rural collector	4,280	A/B
	SR 99	Catlett Road	Two-lane rural collector	520	A/B
Larkin Road	Butte County Line	Live Oak City Limit	Two-lane rural collector	2,990	A/B
	Live Oak City Limit	Paseo Avenue	Two-lane rural collector	1,500	A/B
	Paseo Avenue	Clark Road	Two-lane rural collector	1,500	A/B
	Clark Road	Encinal Road	Two-lane rural collector	1,450	A/B
	Encinal Road	Eager Road	Two-lane rural collector	150	A/B
Lincoln Road	Clements Road	Township Road	Two-lane rural collector	560	A/B
	Township Road	George Washington Boulevard	Two-lane rural collector	1,040	A/B
	George Washington Boulevard	Sanborn Road	Two-lane rural collector	3,670	A/B
Live Oak Boulevard	SR 99	Yuba City city limit	Two-lane rural collector	6,620	A/B
	Pease Road	Northgate Drive	Two-lane minor arterial	7,910*	C*
Market Street	Lynn Way	Ainsley Avenue	Two-lane minor arterial	7,580*	B*
Queens Avenue	Clark Avenue	Live Oak Boulevard	Two-lane minor arterial	8,420*	B*
Railroad Avenue	Bogue Road	Stewart Road	Three-lane urban collector	2,250	A/B
	Stewart Road	Barry Road	Three-lane urban collector	1,320	A/B
	Barry Road	Oswald Road	Two-lane rural collector	1,050	A/B

Sources: Sutter County 2008; City of Yuba City 2004.
* From City of Yuba City General Plan (2004).
ADT = average daily traffic; LOS = level of service; SR = State Route.

Local roads in Sutter County that would provide access to the project area but have no traffic data available are Laurel Avenue, Oak Avenue, Cypress Avenue, Central Avenue, Wilkie Avenue, Tudor Road, Star Bend Road, O'Banion Road, Messick Road, Oswald Road, Barry Road, Shanghai Bend Road, Sutter Street, Teegarden Avenue, Del Norte Avenue, Von Geldern Way, Queens Avenue, Market Street, Lynn Way, Northgate Drive, Pease Road, Eager Road, Rednall Road, Morse Road, Clark Road, Kent Avenue, Koch Lane, Hermanson Street, Bridgeford Road, Paseo Avenue, Bishop Avenue, Archer Avenue, Pennington Road, Metteer Road, Cooley Road, Riviera Road, Campbell Road, and six unnamed roads.

Navigation

Navigation in the project area is confined to the Feather River, which runs adjacent to the project levees on their eastern side. The Feather River is considered navigable for the 28 miles from the mouth of the river to the railroad bridge at Marysville. The width and depth of the river vary greatly, and traffic is limited to recreational watercraft. There are no marinas or boat ramps in the project area. However, Yuba City has a boat ramp between the levee and the river, where the levee is set back several hundred feet from the water, and there is also a boat ramp at the end of Pennington Road that is between the project area and the river.

3.4.3 Environmental Consequences

This section describes the environmental consequences of the proposed project relating to traffic, transportation, and navigation. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.4.3.1 Assessment Methods

This evaluation of traffic, transportation, and navigation is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project. The proposed project would construct levee alternatives along a section of the Feather River West Levee, which would require the hauling of material from nearby borrow sites described in Chapter 2, *Alternatives*. For all three alternatives, hauling of material from different borrow sites could occur simultaneously. Because of the earthwork involved and the need for material deliveries from borrow sites, construction would intermittently generate substantial volumes of traffic. Once the construction is completed, operation and maintenance activities would not generate traffic levels higher than current conditions. Analysis of traffic effects therefore concentrates on the construction of levee alternatives.

Project activities were analyzed according to truck and worker trip effects on roadway operation and circulation. This analysis used estimated construction traffic generation (expressed as average trips per day) to develop a quantitative evaluation of short-term effects on the local and regional roadways in the project vicinity. Based on preliminary construction information provided by the HDR/Wood Rodgers design team in its January 17, 2012, technical memo regarding the Feather River West Levee project description, the phase of construction involving the importation of borrow material would have the highest amount of traffic trips and therefore would represent the maximum daily trips that would occur during construction. Daily truck trips required to import fill materials are estimated based on a typical capacity of 12 cubic yards per truck. Because of their size and slow acceleration, each dump truck was estimated to have a passenger-car equivalent of 1.5 when calculating estimated maximum daily truck trips. Each truck and each worker would generate two construction-related trips. For each construction contract of the project (A through D), the total daily borrow site truck trips and worker trips were added to the main haul route that would be used to access each of the four construction contracts and the access roads for each individual reach. The total truck trips and worker trips then were divided equally among the levee access roadways that would be used to access the project construction areas from the main haul route.

Table 3.4-6 shows the projected main haul route and secondary levee access route roadways for each construction contract. These haul routes were identified based on professional judgment to perform an initial review of effects. These haul routes would be applied identically to each alternative.

Table 3.4-6. Haul Routes by Construction Contract

Construction Contract (Reaches)	Main Haul Route(s)	Secondary Levee Access Route Roadways
A (2–5)	SR 99	Laurel Avenue
		Oak Avenue
		Cypress Avenue
		Central Avenue
		Tudor Road–Garden Highway–Wilkie Avenue
B (6–12)	SR 99	Tudor Road–Garden Highway–Wilkie Avenue
		Tudor Road–Garden Highway–Starbend Road
		O'Banion Road–Garden Highway–Unnamed Road
		Messick Road–Garden Highway–Unnamed Road
		Messick Road–Garden Highway–Unnamed Road
		Oswald Road–Garden Highway–Unnamed Road
		Barry Road–Garden Highway–Unnamed Road
C (13–25)	SR 99	Bogue Road–Garden Highway–Shanghai Bend Road
		Franklin Avenue–Garden Highway–2nd Street
		Bridge Street–Twin Cities Memorial Bridge
		SR 20–Sutter Street–Teegarden Avenue
		SR 20–Live Oak Blvd–Del Norte Avenue–Sutter Street–Von Geldern Way
		Queens Avenue–Market Street–Lynn Way
		Northgate Drive
		Pease Road–Live Oak Boulevard
		Eager Road–Live Oak Boulevard–Rednall Road
		Eager Road–Live Oak Boulevard–Unnamed Road
		Morse Road
	SR 99	Clark Road–Kent Avenue–Koch Lane
		Clark Road–Kent Avenue–Hermanson Street
		Clark Road–Kent Avenue–Bridgeford Road
		Paseo Avenue
		Bishop Avenue
		Archer Avenue
		Pennington Road
		Pennington Road–Metteer Road–Cooley Road
	Larkin Road	Riviera Road–Metteer Road–Campbell Road

Construction Contract (Reaches)	Main Haul Route(s)	Secondary Levee Access Route Roadways
D (26–41)	Larkin Road	Chandon Avenue
		Campbell Avenue
		East Evans Reimer Road
		Richards Avenue–Kirk Road–Keifer Avenue
		East Gridley Road
		Unnamed Road
		Almond Avenue
		Palm Avenue
		Cherry Avenue
		Vance Avenue
		Unnamed Road

SR = State Route.

Table 3.4-7 shows the estimated maximum daily construction traffic for the proposed project for each of the main haul route segments for each alternative and the secondary individual levee access road traffic increases. These estimates include haul truck trips to and from borrow sites as well as worker trips to and from the project site. As stated above, truck trips are multiplied by 1.5, and total vehicle trips are divided equally among the secondary levee access road segments.

Table 3.4-7. Maximum Daily Construction Traffic Increases by Alternative and Construction Contract

Alternative (Construction Contract)	Main Haul Route Truck Trips	Main Haul Route Worker Trips	Main Haul Route Total Trips	Secondary Levee Access Route Total Trips
1(A)	1,017	250	1,267	254
1(B)	2,490	240	2,730	390
1(C)	1,022	320	1,342	67
1(D)	917	320	1,237	112
2(A)	2,394	410	2,804	561
2(B)	4,025	400	4,425	632
2(C)	3,725	420	4,145	207
2(D)	813	320	1,133	103
3(A)	1,382	250	1,632	326
3(B)	2,097	240	2,337	334
3(C)	1,022	320	1,342	67
3(D)	917	320	1,237	112

3.4.3.2 Determination of Effects

For this analysis, an effect pertaining to traffic, transportation, and navigation was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), standards of professional practice, the Sutter and Butte County general plans, and the City of Live Oak and City of Yuba City general plans.

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to, LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise decrease the performance or safety of such facilities.

3.4.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning traffic, transportation, and navigation are summarized in Table 3.4-8.

Table 3.4-8. Summary of Effects for Traffic, Transportation, and Navigation

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-2: Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant
Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers	Less than significant	None required	Less than significant
Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-7: Temporary Changes to Navigation	~~Less than significant~~No effect	None required	~~Less than significant~~No effect
Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities	Less than significant	None required	Less than significant

3.4.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions. No construction-related effects relating to traffic, transportation, and navigation such as road closures and modifications would occur. Therefore, there would be no effect on traffic, transportation, and navigation attributable to the implementation of the No Action Alternative.

However, without levee improvements, the risk of levee failure continues. A catastrophic levee failure would result in collapse of levee slopes and loss of soil, which would trigger widespread flooding and damage to roadways and other infrastructure systems. Furthermore, flooding could result in substantial disruption to emergency response capacity and critical lifelines in Sutter and Butte Counties.

3.4.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on traffic, transportation, and navigation. These potential effects and related mitigation measure requirements are summarized in Table 3.4-9 and discussed below.

Table 3.4-9. Traffic, Transportation, and Navigation Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-2: Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant
Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers	Less than significant	None required	Less than significant
Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-7: Temporary Changes to Navigation	~~Less than significant~~No effect	None required	~~Less than significant~~No effect
Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities	Less than significant	None required	Less than significant

Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic

Implementation of Alternative 1 would require hauling of borrow material from borrow sites to the project area along highways and local roadways, as well as usage of the same roads by construction workers. The use of these roadways for hauling and daily worker trips would increase daily traffic.

Additionally, the hauling of borrow material would involve slow-moving trucks, which would further affect traffic. The addition of the maximum daily construction-generated traffic shown in Table 3.4-7 to the ADT counts in Tables 3.4-2 through 3.4-5 would result in the construction-period changes to ADT and LOS shown in Table 3.4-10. As transport of borrow material for all four construction contracts may occur simultaneously, traffic totals on the main haul routes for each project were combined when haul routes for each project overlap.

Table 3.4-10. Existing and Projected Average Daily Traffic on Haul Routes for Alternative 1

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
SR 99 (P)	Live Oak City Limit to county line	14,900	D	536	15,436	D
	Pennington Road to Live Oak city limit	18,700	E	536	19,236	E
	Encinal/Live Oak Boulevard to Pennington Road	19,200	E	536	19,736	E
	End of freeway to Encinal/Live Oak Boulevard	17,000	E	603	17,603	E
	Eager Road to end of freeway	17,000	A/B	603	17,603	A/B
	Queens Avenue to Eager Road	19,400	A/B	4,737	24,137	A/B
	Junction SR 20 to Queens Avenue	20,500	A/B	4,737	25,237	A/B
	Onstott Road to Junction SR 20	29,500	C	4,737	34,237	C
	Bridge Street to Onstott Road	29,500	C	4,737	34,237	C
	Franklin Road to Bridge Street	33,000	C	4,737	37,737	C
	Lincoln Road to Franklin Road	29,000	A/B	4,737	33,737	A/B
	Bogue Road to Lincoln Road	23,200	A/B	4,737	27,937	A/B
	Barry Road to Bogue Road	18,500	A/B	4,000	22,500	A/B
	Oswald Road to Barry Road	17,200	A/B	3,610	20,810	A/B
	SR 113 to Oswald Road	15,400	A/B	3,220	18,620	A/B
	Tudor Road/Garden Highway to SR 113	13,200	A/B	2,050	15,250	A/B
	Sacramento Avenue to Tudor Road/ Garden Highway	15,800	A/B	1,016	16,816	A/B
Larkin Road (P)	SR 162 to East Hamilton Road	3,580	C	112	3,692	C
	East Hamilton Road to East Biggs Highway	1,000	C	336	1,336	C
	East Biggs Highway to Gridley Highway	500	C	672	1,172	C
	Gridley Highway to East Evans Reimer Road	2,500	C	896	3,396	C
	East Evans Reimer Road to county line	ND	ND	1,232	ND	ND
	County line to Live Oak city limit	2,990	A/B	1,299	4,289	A/B
	Live Oak city limit to Paseo Avenue	1,500	A/B	1,299	2,799	A/B
Laurel Avenue		ND	ND	254	ND	ND
Oak Avenue		ND	ND	254	ND	ND
Cypress Avenue		ND	ND	254	ND	ND
Central Avenue		ND	ND	254	ND	ND
Tudor Road		ND	ND	254	ND	ND

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Garden Highway	O'Banion Road to SR 99	4,280	A/B	1,424	5,704	A/B
	Messick Road to O'Banion Road	4,290	A/B	780	5,070	A/B
	Stewart Road to Messick Road	5,230	A/B	780	6,010	A/B
	Bogue Road to Shanghai Bend Road	ND	ND	67	ND	ND
	Franklin Avenue to 2nd Street	ND	ND	67	ND	ND
Wilkie Avenue		ND	ND	644	ND	ND
Star Bend Road		ND	ND	390	ND	ND
O'Banion Road		ND	ND	390	ND	ND
Unnamed Road 1		ND	ND	390	ND	ND
Messick Road		ND	ND	780	ND	ND
Unnamed Road 2		ND	ND	390	ND	ND
Unnamed Road 3		ND	ND	390	ND	ND
Oswald Road		ND	ND	390	ND	ND
Unnamed Road 4		ND	ND	390	ND	ND
Barry Road		ND	ND	390	ND	ND
Unnamed Road 5		ND	ND	390	ND	ND
Bogue Road	SR 99 to Railroad Avenue	5,860*	B*	67	5,927	ND
Shanghai Bend Road		ND	ND	67	ND	ND
Franklin Avenue	Gray Avenue to Clark Avenue	12,920*	C*	67	12,987	ND
	Park Avenue to Percy Avenue	8,320*	B*	67	8,387	ND
2nd Street	B Street to Franklin Road	13,240*	C*	67	13,307	ND
Bridge Street	Clark Avenue to Plumas Street	18,130*	C*	67	18,197	ND
	East of 2nd Street to Twin Cities Bridge	22,000*	F*	67	22,067	ND
SR 20	Junction Route 99 to Live Oak Boulevard	41,750	C	134	41,884	D
	Live Oak Boulevard to Plumas Street	43,000	D	67	43,067	D
	Plumas Street to Sutter Street	38,000	C	67	38,067	C
Sutter Street		ND	ND	134	ND	ND
Teegarden Avenue		ND	ND	67	ND	ND
Live Oak Boulevard	SR 20 to Del Norte Avenue	ND	ND	67	ND	ND
	SR 99 to Yuba City city limit	6,620	A/B	67	6,687	A/B
	Pease Road to Northgate Drive	7,910*	C*	67	7,977	ND
Del Norte Avenue		ND	ND	67	ND	
Von Geldern Way		ND	ND	67	ND	
Queens Avenue	Clark Avenue to Live Oak Boulevard	8,420*	B*	67	8,487	ND
Market Street	Lynn Way to Ainsley Avenue	7,580*	B*	67	7,647	ND
Lynn Way		ND	ND	67	ND	ND
Northgate Drive		ND	ND	67	ND	ND
Pease Road		ND	ND	67	ND	ND

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Eager Road		ND	ND	134	ND	ND
Rednall Road		ND	ND	67	ND	ND
Unnamed Road 6		ND	ND	67	ND	ND
Morse Road		ND	ND	67	ND	ND
Clark Road		ND	ND	201	ND	ND
Kent Avenue		ND	ND	201	ND	ND
Koch Lane		ND	ND	67	ND	ND
Hermanson Street		ND	ND	67	ND	ND
Bridgeford Road		ND	ND	67	ND	ND
Paseo Avenue		ND	ND	67	ND	ND
Bishop Avenue		ND	ND	67	ND	ND
Archer Avenue		ND	ND	67	ND	ND
Pennington Road		ND	ND	134	ND	ND
Metteer Road		ND	ND	134	ND	ND
Cooley Road		ND	ND	67	ND	ND
Riviera Road		ND	ND	67	ND	ND
Campbell Road		ND	ND	67	ND	ND
Chandon Avenue		ND	ND	112	ND	ND
Campbell Avenue		ND	ND	112	ND	ND
East Evans Reimer Road		ND	ND	112	ND	ND
Richards Avenue		ND	ND	112	ND	ND
Kirk Road		ND	ND	112	ND	ND
Keifer Avenue		ND	ND	112	ND	ND
East Gridley Road	Larkin Road to SR 70	5,500	C	112	5,612	C
Unnamed Road 7		ND	ND	112	ND	ND
Almond Avenue		ND	ND	112	ND	ND
Palm Avenue		ND	ND	112	ND	ND
Cherry Avenue		ND	ND	112	ND	ND
Vance Avenue		ND	ND	112	ND	ND
Unnamed Road 8		ND	ND	112	ND	ND

* From City of Yuba City General Plan (2004), the plan does not provide LOS thresholds to determine temporary LOS.

P = primary haul route (all others are secondary roads); ND = no data available; ADT = average daily traffic; LOS = level of service; SR = State Route.

The construction traffic generated by Alternative 1 would temporarily increase the daily and peak hour traffic along specified road segments shown in Table 3.4-10; however, traffic levels on haul route roads would return to normal levels once construction is completed. These road segments are

expected to maintain their current LOS with the exception of SR 20 from its junction with SR 99 to Live Oak Boulevard. Under Alternative 1, this road segment would degrade to an LOS of D. However, this LOS is within the standards of Caltrans; accordingly, this change would not be considered a significant effect.

Slow-moving, heavy trucks could affect traffic flow on all haul routes, particularly if numerous trips occur during the morning or afternoon peak traffic periods. Implementation of the traffic control and road maintenance plan environmental commitment, described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would reduce the effects of construction traffic on all haul routes to a less-than-significant level. No mitigation is required.

Effect TRA-2: Temporary Road Closures

Implementation of Alternative 1 would involve the temporary closure of portions of Garden Highway, 2nd Street in Yuba City, Live Oak Boulevard in Yuba City, and Larkin Road at the northern end of the project area. Temporary road closures would require a detour of normal traffic to adjacent streets. The rerouting of traffic would increase daily traffic volumes on roads in the surrounding areas. The environmental commitment to develop and implement a traffic control and road maintenance plan, as described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would reduce this effect to a less-than-significant level. No mitigation is required.

Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic

The maneuvering of construction-related vehicles and equipment among general-purpose traffic on local roads that provide access to the project area could cause safety hazards. However, execution of the environmental commitment to develop and implement a traffic control and road maintenance plan, described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would minimize construction-related traffic hazards and would reduce the intensity of this effect. This effect would be less than significant; no mitigation is required.

Effect TRA-4: Increase in Emergency Response Times

Emergency access to the areas adjacent to the project could be affected by construction of Alternative 1, as construction-related traffic could delay or obstruct the movement of emergency vehicles. However, execution of the environmental commitment to develop and implement a traffic control and road maintenance plan, described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would minimize construction-related effects on emergency response times. This effect would be less than significant. No mitigation is required.

Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers

A parking area for construction workers and trucks would be provided at staging areas adjacent to work sites or areas within the levee right-of-way; accordingly, this effect would be less than significant. No mitigation is required.

Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures

The hauling of material in large trucks as well as temporary road closures could interfere with bicycle travel along local roads. Implementation of the traffic control and road maintenance plan environmental commitment, described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would minimize construction-related traffic conflicts with bicycle travel. Therefore, this effect would be less than significant. No mitigation is required.

Effect TRA-7: Temporary Changes to Navigation

Placement of material would not require access to the waterside slope of the project levee via the Feather River. Barges would not be utilized for construction activities which ~~along the waterside slope of the project levee would require the use of two barges along the Feather River, which~~ could cause a temporary reduction in navigability. ~~The use of barges would decrease the available space for navigation of watercraft. However, given the width of the waterways to be used, watercraft still would be able to pass along the section of the river adjacent to the project area.~~ Navigation in the Feather River would ~~return to normal conditions~~not be impacted during ~~following the placement of material, and there would be no permanent effects.~~ construction of the project.~~Accordingly, this effect would be less than significant. No mitigation is required.~~ Alternative 1 would therefore have no effect related to temporary changes to navigation.

Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities

The use and/or transport of heavy machinery on project roadways could result in damage or deterioration of the roads, which would create a safety hazard for drivers once construction is complete. However, as described in Section 2.3.4.3 of Chapter 2, *Alternatives*, SBFCA will assess damage to roadways used during construction and will repair all potholes, fractures, and other damages. Accordingly, this effect would be less than significant. No mitigation is required.

3.4.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on traffic, transportation, and navigation. These potential effects and related mitigation measure requirements are summarized in Table 3.4-11 and discussed below.

Table 3.4-11. Traffic, Transportation, and Navigation Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-2: Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant
Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers	Less than significant	None required	Less than significant
Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-7: Temporary Changes to Navigation	~~Less than significant~~No effect	None required	~~Less than significant~~No effect
Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities	Less than significant	None required	Less than significant

Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic

Implementation of Alternative 2 would require hauling of borrow material from borrow sites to the project area along highways and local roadways, as well as use of the same roads by construction workers. The use of these roadways for hauling and daily worker trips would increase daily traffic. Additionally, the hauling of borrow material would involve slow-moving trucks, which would further affect traffic. The addition of the maximum daily construction-generated traffic shown in Table 3.4-7 to the ADT counts in Tables 3.4-2 through 3.4-5 would result in the construction-period changes to ADT and LOS shown in Table 3.4-12. As transport of borrow material for all four construction contracts may occur simultaneously, traffic totals on the main haul routes for each project were combined when haul routes for each project overlap.

Table 3.4-12. Existing and Projected Average Daily Traffic on Haul Routes for Alternative 2

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
SR 99 (P)	Live Oak city limit to county line	14,900	D	1,656	16,556	E
	Pennington Road to Live Oak city limit	18,700	E	1,656	20,356	E
	Encinal/Live Oak Boulevard to Pennington Road	19,200	E	1,656	20,856	E
	End of freeway to Encinal/Live Oak Boulevard	17,000	E	1,863	18,863	E
	Eager Road to end of freeway	17,000	A/B	1,863	18,863	A/B
	Queens Avenue to Eager Road	19,400	A/B	9,506	28,906	A/B
	Junction SR 20 to Queens Avenue	20,500	A/B	9,506	30,006	A/B
	Onstott Road to Junction SR 20	29,500	C	9,506	39,006	C

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
	Bridge Street to Onstott Road	29,500	C	9,506	39,006	C
	Franklin Road to Bridge Street	33,000	C	9,506	42,506	D
	Lincoln Road to Franklin Road	29,000	A/B	9,506	38,506	C
	Bogue Road to Lincoln Road	23,200	A/B	9,506	32,706	C
	Barry Road to Bogue Road	18,500	A/B	7,229	25,729	A/B
	Oswald Road to Barry Road	17,200	A/B	6,597	23,797	A/B
	SR 113 to Oswald Road	15,400	A/B	5,965	21,365	A/B
	Tudor Road/Garden Highway to SR 113	13,200	A/B	4,069	17,269	A/B
	Sacramento Avenue to Tudor Road/ Garden Highway	15,800	A/B	2,244	18,044	A/B
Larkin Road (P)	SR 162 to East Hamilton Road	3,580	C	103	3,683	C
	East Hamilton Road to East Biggs Highway	1,000	C	309	1,309	C
	East Biggs Highway to Gridley Highway	500	C	618	1,118	C
	Gridley Highway to East Evans Reimer Road	2,500	C	824	3,324	C
	East Evans Reimer Road to county line	ND	ND	1,133	ND	ND
	County line to Live Oak city limit	2,990	A/B	1,340	4,330	A/B
	Live Oak city Limit to Paseo Avenue	1,500	A/B	1,340	2,840	A/B
Laurel Avenue		ND	ND	561	ND	ND
Oak Avenue		ND	ND	561	ND	ND
Cypress Avenue		ND	ND	561	ND	ND
Central Avenue		ND	ND	561	ND	ND
Tudor Road		ND	ND	561	ND	ND
Garden Highway	O'Banion Road to SR 99	4,280	A/B	2,457	6,737	A/B
	Messick Road to O'Banion Road	4,290	A/B	1,264	5,554	A/B
	Stewart Road to Messick Road	5,230	A/B	1,264	6,494	A/B
	Bogue Road to Shanghai Bend Road	ND	ND	207	ND	ND
	Franklin Avenue to 2nd Street	ND	ND	207	ND	ND
Wilkie Avenue		ND	ND	1,193	ND	ND
Star Bend Road		ND	ND	390	ND	ND
O'Banion Road		ND	ND	390	ND	ND
Unnamed Road 1		ND	ND	390	ND	ND
Messick Road		ND	ND	780	ND	ND
Unnamed Road 2		ND	ND	390	ND	ND
Unnamed Road 3		ND	ND	390	ND	ND
Oswald Road		ND	ND	390	ND	ND
Unnamed Road 4		ND	ND	390	ND	ND
Barry Road		ND	ND	390	ND	ND
Unnamed Road 5		ND	ND	390	ND	ND
Bogue Road	SR 99 to Railroad Avenue	5,860*	B*	207	6,067	ND

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Shanghai Bend Road		ND	ND	207	ND	ND
Franklin Avenue	Gray Avenue to Clark Avenue	12,920*	C*	207	13,127	ND
	Park Avenue to Percy Avenue	8,320*	B*	207	8,527	ND
2nd Street	B Street to Franklin Road	13,240*	C*	207	13,447	ND
Bridge Street	Clark Avenue to Plumas Street	18,130*	C*	207	18,337	ND
	East of 2nd Street to Twin Cities Bridge	22,000*	F*	207	22,207	ND
SR 20	Junction Route 99 to Live Oak Boulevard	41,750	C	414	42,164	D
	Live Oak Boulevard to Plumas Street	43,000	D	207	43,207	D
	Plumas Street to Sutter Street	38,000	C	207	38,207	C
Sutter Street		ND	ND	414	ND	ND
Teegarden Avenue		ND	ND	207	ND	ND
Live Oak Boulevard	SR 20 to Del Norte Ave	ND	ND	207	ND	ND
	SR 99 to Yuba City city limit	6,620	A/B	207	6,827	A/B
	Pease Road to Northgate Drive	7,910*	C*	207	8,117	ND
Del Norte Avenue		ND	ND	207	ND	ND
Von Geldern Way		ND	ND	207	ND	ND
Queens Avenue	Clark Avenue to Live Oak Boulevard	8,420*	B*	207	8,627	ND
Market Street	Lynn Way to Ainsley Avenue	7,580*	B*	207	7,787	ND
Lynn Way		ND	ND	207	ND	ND
Northgate Drive		ND	ND	207	ND	ND
Pease Road		ND	ND	207	ND	ND
Eager Road		ND	ND	414	ND	ND
Rednall Road		ND	ND	207	ND	ND
Unnamed Road 6		ND	ND	207	ND	ND
Morse Road		ND	ND	207	ND	ND
Clark Road		ND	ND	621	ND	ND
Kent Avenue		ND	ND	621	ND	ND
Koch Lane		ND	ND	207	ND	ND
Hermanson Street		ND	ND	207	ND	ND
Bridgeford Road		ND	ND	207	ND	ND
Paseo Avenue		ND	ND	207	ND	ND
Bishop Avenue		ND	ND	207	ND	ND
Archer Avenue		ND	ND	207	ND	ND
Pennington Road		ND	ND	414	ND	ND
Metteer Road		ND	ND	414	ND	ND
Cooley Road		ND	ND	207	ND	ND
Riviera Road		ND	ND	207	ND	ND
Campbell Road		ND	ND	207	ND	ND

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Chandon Avenue		ND	ND	103	ND	ND
Campbell Avenue		ND	ND	103	ND	ND
East Evans Reimer Road		ND	ND	103	ND	ND
Richards Avenue		ND	ND	103	ND	ND
Kirk Road		ND	ND	103	ND	ND
Keifer Avenue		ND	ND	103	ND	ND
East Gridley Road	Larkin Road to SR 70	5,500	C	103	5,603	C
Unnamed Road 7		ND	ND	103	ND	ND
Almond Avenue		ND	ND	103	ND	ND
Palm Avenue		ND	ND	103	ND	ND
Cherry Avenue		ND	ND	103	ND	ND
Vance Avenue		ND	ND	103	ND	ND
Unnamed Road 8		ND	ND	103	ND	ND

* From City of Yuba City General Plan (2004), the plan does not provide LOS thresholds to determine temporary LOS.

P = primary haul route (all others are secondary roads); ND = no data available; ADT = average daily traffic; LOS = level of service; SR = State Route.

The construction traffic generated by Alternative 2 would temporarily increase the daily and peak hour traffic along specified road segments shown in Table 3.4-12; however, traffic levels on haul route roads would return to normal levels once construction is completed. These road segments are expected to maintain their current LOS with the exception of SR 99 from the Live Oak city limit to the Sutter County line, SR 99 from Franklin Road to Bridge Street, and SR 20 from its junction with SR 99 to Live Oak Boulevard. Under Alternative 2, these road segments would degrade to an LOS of E, D, and D, respectively. However, these LOS levels are within the standards of Caltrans; accordingly, these changes would not be considered significant effects.

Slow-moving, heavy trucks could affect traffic flow on all haul routes, particularly if numerous trips occur during the morning or afternoon peak traffic periods. Implementation of the traffic control and road maintenance plan environmental commitment, described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would reduce the effects of construction traffic on all haul routes to a less-than-significant level. No mitigation is required.

Effect TRA-2: Temporary Road Closures

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-4: Increase in Emergency Response Times

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-7: Temporary Changes to Navigation

This effect would be the same as described under Alternative 1. Alternative 2 would therefore have no effect related to temporary changes to navigation.~~This effect is considered less than significant.~~ No mitigation is required.

Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

3.4.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on traffic, transportation, and navigation. These potential effects and related mitigation measure requirements are summarized in Table 3.4-13 and discussed below.

Table 3.4-13. Traffic, Transportation, and Navigation Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-2: Temporary Road Closures	Less than significant	None required	Less than significant
Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic	Less than significant	None required	Less than significant
Effect TRA-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant
Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers	Less than significant	None required	Less than significant
Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures	Less than significant	None required	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect TRA-7: Temporary Changes to Navigation	~~Less than significant~~No effect	None required	~~Less than significant~~No effect
Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities	Less than significant	None required	Less than significant

Effect TRA-1: Temporary Increase in Traffic Volumes from Construction-Generated Traffic

Implementation of Alternative 3 would require hauling of borrow material from borrow sites to the project area along highways and local roadways, as well as use of the same roads by construction workers. The use of these roadways for hauling and daily worker trips would increase daily traffic. Additionally, the hauling of borrow material would involve slow-moving trucks, which would further affect traffic. The addition of the maximum daily construction-generated traffic shown in Table 3.4-7 to the ADT counts in Tables 3.4-2 through 3.4-5 would result in the construction-period changes to ADT and LOS shown in Table 3.4-14. As transport of borrow material for all four construction contracts may occur simultaneously, traffic totals on the main haul routes for each project were combined when haul routes for each project overlap.

Table 3.4-14. Existing and Projected Average Daily Traffic on Haul Routes for Alternative 3

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
SR 99 (P)	Live Oak City Limit to county line	14,900	D	536	15,436	D
	Pennington Road to Live Oak city limit	18,700	E	536	19,236	E
	Encinal/Live Oak Boulevard to Pennington Road	19,200	E	536	19,736	E
	End of freeway to Encinal/Live Oak Boulevard	17,000	E	603	17,603	E
	Eager Road to end of freeway	17,000	A/B	603	17,603	A/B
	Queens Avenue to Eager Road	19,400	A/B	4,705	24,105	A/B
	Junction SR 20 to Queens Avenue	20,500	A/B	4,705	25,205	A/B
	Onstott Road to Junction SR 20	29,500	C	4,705	34,205	C
	Bridge Street to Onstott Road	29,500	C	4,705	34,205	C
	Franklin Road to Bridge Street	33,000	C	4,705	37,705	C
	Lincoln Road to Franklin Road	29,000	A/B	4,705	33,705	A/B
	Bogue Road to Lincoln Road	23,200	A/B	4,705	27,905	A/B
	Barry Road to Bogue Road	18,500	A/B	3,968	22,468	A/B
	Oswald Road to Barry Road	17,200	A/B	3,634	20,834	A/B
	SR 113 to Oswald Road	15,400	A/B	3,300	18,700	A/B
	Tudor Road/Garden Highway to SR 113	13,200	A/B	2,298	15,498	A/B
	Sacramento Avenue to Tudor Road/ Garden Highway	15,800	A/B	1,304	17,104	A/B

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Larkin Road (P)	SR 162 to East Hamilton Road	3,580	C	112	3,692	C
	East Hamilton Road to East Biggs Highway	1,000	C	336	1,336	C
	East Biggs Highway to Gridley Highway	500	C	672	1,172	C
	Gridley Highway to East Evans Reimer Road	2,500	C	896	3,396	C
	East Evans Reimer Road to county line	ND	ND	1,232	ND	ND
	County line to Live Oak city limit	2,990	A/B	1,299	4,289	A/B
	Live Oak city limit to Paseo Avenue	1,500	A/B	1,299	2,799	A/B
Laurel Avenue		ND	ND	326	ND	ND
Oak Avenue		ND	ND	326	ND	ND
Cypress Avenue		ND	ND	326	ND	ND
Central Avenue		ND	ND	326	ND	ND
Tudor Road		ND	ND	326	ND	ND
Garden Highway	O'Banion Road to SR 99	4,280	A/B	1,328	5,608	A/B
	Messick Road to O'Banion Road	4,290	A/B	668	4,958	A/B
	Stewart Road to Messick Road	5,230	A/B	668	5,898	A/B
	Bogue Road to Shanghai Bend Road	ND	ND	67	ND	ND
	Franklin Avenue to 2nd Street	ND	ND	67	ND	ND
Wilkie Avenue		ND	ND	660	ND	ND
Star Bend Road		ND	ND	334	ND	ND
O'Banion Road		ND	ND	334	ND	ND
Unnamed Road 1		ND	ND	334	ND	ND
Messick Road		ND	ND	668	ND	ND
Unnamed Road 2		ND	ND	334	ND	ND
Unnamed Road 3		ND	ND	334	ND	ND
Oswald Road		ND	ND	334	ND	ND
Unnamed Road 4		ND	ND	334	ND	ND
Barry Road		ND	ND	334	ND	ND
Unnamed Road 5		ND	ND	334	ND	ND
Bogue Road	SR 99 to Railroad Avenue	5,860*	B*	67	5,927	ND
Shanghai Bend Road		ND	ND	67	ND	ND
Franklin Avenue	Gray Avenue to Clark Avenue	12,920*	C*	67	12,987	ND
	Park Avenue to Percy Avenue	8,320*	B*	67	8,387	ND
2nd Street	B Street to Franklin Road	13,240*	C*	67	13,307	ND
Bridge Street	Clark Avenue to Plumas Street	18,130*	C*	67	18,197	ND
	East of 2nd Street to Twin Cities Bridge	22,000*	F*	67	22,067	ND
SR 20	Junction Route 99 to Live Oak Boulevard	41,750	C	134	41,884	D
	Live Oak Boulevard to Plumas Street	43,000	D	67	43,067	D
	Plumas Street to Sutter Street	38,000	C	67	38,067	C
Sutter Street		ND	ND	134	ND	ND

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Teegarden Avenue		ND	ND	67	ND	ND
Live Oak Boulevard	SR 20 to Del Norte Avenue	ND	ND	67	ND	ND
	SR 99 to Yuba City city limit	6,620	A/B	67	6,687	A/B
	Pease Road to Northgate Drive	7,910*	C*	67	7,977	ND
Del Norte Avenue		ND	ND	67	ND	ND
Von Geldern Way		ND	ND	67	ND	ND
Queens Avenue	Clark Avenue to Live Oak Boulevard	8,420*	B*	67	8,487	ND
Market Street	Lynn Way to Ainsley Avenue	7,580*	B*	67	7,647	ND
Lynn Way		ND	ND	67	ND	ND
Northgate Drive		ND	ND	67	ND	ND
Pease Road		ND	ND	67	ND	ND
Eager Road		ND	ND	134	ND	ND
Rednall Road		ND	ND	67	ND	ND
Unnamed Road 6		ND	ND	67	ND	ND
Morse Road		ND	ND	67	ND	ND
Clark Road		ND	ND	201	ND	ND
Kent Avenue		ND	ND	201	ND	ND
Koch Lane		ND	ND	201	ND	ND
Hermanson Street		ND	ND	67	ND	ND
Bridgeford Road		ND	ND	67	ND	ND
Paseo Avenue		ND	ND	67	ND	ND
Bishop Avenue		ND	ND	67	ND	ND
Archer Avenue		ND	ND	67	ND	ND
Pennington Road		ND	ND	134	ND	ND
Metteer Road		ND	ND	134	ND	ND
Cooley Road		ND	ND	67	ND	ND
Riviera Road		ND	ND	67	ND	ND
Campbell Road		ND	ND	67	ND	ND
Chandon Avenue		ND	ND	112	ND	ND
Campbell Avenue		ND	ND	112	ND	ND
East Evans Reimer Road		ND	ND	112	ND	ND
Richards Avenue		ND	ND	112	ND	ND
Kirk Road		ND	ND	112	ND	ND
Keifer Avenue		ND	ND	112	ND	ND
East Gridley Road	Larkin Road to SR 70	5,500	C	112	5,612	C

Street	Limits	Existing ADT	Existing LOS	Max Trips/Day	ADT during Construction	Temp. LOS
Unnamed Road 7		ND	ND	112	ND	ND
Almond Avenue		ND	ND	112	ND	ND
Palm Avenue		ND	ND	112	ND	ND
Cherry Avenue		ND	ND	112	ND	ND
Vance Avenue		ND	ND	112	ND	ND
Unnamed Road 8		ND	ND	112	ND	ND

* From City of Yuba City General Plan (2004), which does not provide LOS thresholds to determine temporary LOS.

P = primary haul route (all others are secondary roads); ND = no data available; ADT = average daily traffic; LOS = level of service; SR = State Route.

The construction traffic generated by Alternative 3 would temporarily increase the daily and peak hour traffic along specified road segments shown in Table 3.4-14; however, traffic levels on haul route roads would return to normal levels once construction is completed. These road segments are expected to maintain their current LOS with the exception of SR 20 from its junction with SR 99 to Live Oak Boulevard. Under Alternative 3, this road segment would degrade to an LOS of D. However, this LOS is within the standards of Caltrans; accordingly, this change would not be considered a significant effect.

Slow-moving, heavy trucks could affect traffic flow on all haul routes, particularly if numerous trips occur during the morning or afternoon peak traffic periods. Implementation of the traffic control and road maintenance plan environmental commitment, described in Section 2.3.4.3 of Chapter 2, *Alternatives*, would reduce the effects of construction traffic on all haul routes to a less-than-significant level. No mitigation is required.

Effect TRA-2: Temporary Road Closures

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-3: Increase in Safety Hazards Attributable to Construction-Generated Traffic

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-4: Increase in Emergency Response Times

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-5: Inadequate Parking Supply to Meet Parking Demand for Construction Equipment and Construction Workers

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-6: Disruption of Alternative Transportation Modes as a Result of Temporary Road Closures

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

Effect TRA-7: Temporary Changes to Navigation

This effect would be the same as described under Alternative 1. Alternative 3 would therefore have no effect related to temporary changes to navigation. ~~This effect is considered less than significant.~~No mitigation is required.

Effect TRA-8: Damage to Roadway Surfaces during Construction of Facilities

This effect would be the same as described under Alternative 1. This effect is considered less than significant. No mitigation is required.

3.5 Air Quality

3.5.1 Introduction

This section describes the regulatory and environmental setting for air quality; effects on air quality that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects. Additional information on the technical modeling procedures used to quantify air quality effects is provided in Appendix D.

The key sources of data and information used in the preparation of this section are listed below.

- Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2010).
- Indirect Source Review Guidelines (Feather River Air Quality Management District 2010).
- CEQA Air Quality Handbook Guidelines (Butte County Air Quality Management District 2008).
- Ambient Air Quality Standards (California Air Resources Board 2010).
- Air Designation Maps/State and National (California Air Resources Board 2012).
- iADAM Air Quality Data Statistics (California Air Resources Board 2011).
- The Green Book of Nonattainment Areas for Criteria Pollutants (U.S. Environmental Protection Agency 2012).

3.5.2 Affected Environment

The project area and surrounding areas are subject to air quality regulations developed and implemented at the Federal, state, and local levels. At the Federal level, EPA is responsible for implementation of the Clean Air Act (CAA). Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by EPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Responsibility for attaining and maintaining air quality in California is divided between the California Air Resources Board (ARB) and regional air quality districts. Areas of control for the regional districts are set by ARB, which divides the state into air basins. These air basins are defined by topography that limits air flow access, or by county boundaries. Plans, policies, and regulations relevant to the proposed project are discussed below.

3.5.2.1 Regulatory Setting

At the Federal level, air quality in the United States and California is governed by the CAA, which is administered by the EPA. Air quality in the State of California also is governed by more stringent regulations in the California Clean Air Act (CCAA), administered by ARB and the local air quality management districts. ARB and local air districts have primary implementation responsibility for both the Federal and state air quality standards. This section summarizes key Federal, state, and local regulatory information that applies to air quality. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to air quality may apply to implementation of the proposed project.

Clean Air Act and National Ambient Air Quality Standards

The Federal CAA, promulgated in 1963 and amended several times thereafter, including the 1990 Clean Air Act amendments (CAAA), establishes the framework for modern air pollution control. The act directs the EPA to establish national ambient air quality standards (NAAQS) for the six criteria pollutants: ozone (O_3), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM), which consists of PM 10 microns in diameter or less (PM10) and PM 2.5 microns in diameter or less (PM2.5). The NAAQS are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life. Table 3.5-1 summarizes the NAAQS.

The CAA requires states to submit a SIP for areas in nonattainment for Federal standards. The SIP, which is reviewed and approved by EPA, must demonstrate how the Federal standards would be achieved. Failing to submit a plan or secure approval could lead to denial of Federal funding and permits. In cases where the SIP is submitted by the state but fails to demonstrate achievement of the standards, EPA is directed to prepare a Federal implementation plan.

General Conformity Regulation

EPA enacted the Federal general conformity regulation (40 CFR Parts 5, 51, and 93) in 1993. The general conformity rule applies to Federal actions located in nonattainment areas that do not include stationary industrial sources requiring preconstruction air quality permits from local air pollution control agencies. The purpose is to ensure that Federal actions do not generate emissions that interfere with state and local agencies' SIPs and emission-reduction strategies.

The general conformity rule applies in air quality nonattainment or maintenance areas, and only to direct and indirect emissions associated with the portions of any Federal action for which a Federal permitting agency has the authority to impose emission reductions. Because the proposed project is within USACE jurisdiction and would require a permit from the USACE, all direct and indirect emissions generated by project construction would be subject to general conformity.

Table 3.5-1. Ambient Air Quality Standards Applicable in California

			Standard (ppm)		Standard (µg/m³)		Violation Criteria	
Pollutant	Symbol	Average Time	California	National	California	National	California	National
Ozone*	O_3	1 hour	0.09	–	180	–	If exceeded	–
		8 hours	0.070	0.075	137	147	If exceeded	If fourth-highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor in an area
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	–	7,000	–	If equaled or exceeded	–
Nitrogen dioxide	NO_2	Annual arithmetic mean	0.030	0.053	57	100	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.18	0.100	339	188	If exceeded	–
Sulfur dioxide	SO_2	24 hours	0.04	–	105	–	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	0.075	655	196	If exceeded	–
		3 hour	0.50*	–	1,300*	–		
Hydrogen sulfide	H_2S	1 hour	0.03	–	42	–	If equaled or exceeded	–
Vinyl chloride	C_2H_3Cl	24 hours	0.01	–	26	–	If equaled or exceeded	–
Inhalable particulate matter	PM10	Annual arithmetic mean	–	–	20	–	–	–
		24 hours	–	–	50	150	If exceeded	If exceeded on more than 1 day per year
	PM2.5	Annual arithmetic mean	–	–	12	15	–	If 3-year average from single or multiple community-oriented monitors is exceeded
		24 hours	–	–	–	35	–	If 3-year average of 98th percentile at each population-oriented monitor in an area is exceeded
Sulfate particles	SO_4	24 hours	–	–	25	–	If equaled or exceeded	–
Lead particles	Pb	Calendar quarter	–	–	–	1.5	–	If exceeded no more than 1 day per year
		30-day average	–	–	1.5	–	If equaled or exceeded	–
		Rolling 3-month average	–	–	–	0.15	If equaled or exceeded	Averaged over a rolling 3-month period

Source: California Air Resources Board 2010.

* secondary standard; ppm = parts per million; µg/m³= micrograms per cubic meter.

The proposed project would generate air pollutant emissions from construction sites in Sutter and Butte Counties, both of which are designated a nonattainment area for O_3 NAAQS and a nonattainment area for PM2.5 NAAQS. Butte County is a moderate maintenance area for CO NAAQS. Based on those designations, the general conformity thresholds are as follows.

- 25 tons per year of oxides of nitrogen (NO_X) (O_3 precursor).
- 25 tons per year of reactive organic gases (ROG) (O_3 precursor).
- 100 tons per year of PM2.5.
- 100 tons per year of CO.

All emission sources (e.g., haul trucks, off-road equipment) that operate on the proposed project components are required to comply with the general conformity thresholds. If the net emissions increases attributable to the action are less than the threshold levels, then the action is presumed to conform and no further conformity evaluation is required. If the emissions increases exceed any of the thresholds, and the action does not meet any of a number of criteria in the rule for exemptions or presumption of conformity, then a formal conformity determination is required. A conformity determination can include air quality modeling studies; consultation with EPA and state air quality agencies; and commitments to revise the SIP, obtain emission offsets, or to implement measures to mitigate air quality effects. As emissions associated with the APA (Alternative 3) are below the General Conformity *de minimis* thresholds, a general conformity determination is not required for the APA. While emissions associated with Alternative 2 are in excess of the General Conformity *de minimis* thresholds, a General Conformity determination is not required and is not included in the FDEIS, as it is not the APA. Consequently, the general conformity determination that was included in Appendix D for Alternative 2 has been removed from this analysis.

State

The following state policies related to air quality may apply to implementation of the proposed project.

In 1988, the state legislature adopted the CCAA, which established a statewide air pollution control program. The CCAA requires all air districts in the state to endeavor to meet the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. Unlike the Federal CAA, the CAAQS do not set precise attainment deadlines. Instead, the act establishes increasingly stringent requirements for areas that would require more time to achieve the standards. The CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 3.5-1.

ARB and local air districts bear responsibility for achieving the CAAQS, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to ARB, which, in turn, has delegated that authority to individual air districts. ARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

Idling Limit Regulation

On June 15, 2008, the ARB adopted a regulation for off-road diesel vehicles. The regulation is designed to reduce toxic air contaminants (TACs) from diesel-powered construction and mining vehicles operating in California. Fleet owners are subject to retrofit or accelerated replacement/repower requirements for which ARB must obtain authorization from EPA prior to enforcement.

The regulation also imposes idling limitations on owners, operators, and renters or lessees of off-road diesel vehicles. The idling limits became effective on June 15, 2008 and require an operator of applicable off-road vehicles (self-propelled diesel-fueled vehicles of 25 horsepower and greater that were not designed for on-road driving) to limit idling to no more than 5 minutes. These requirements are specified in 13 CCR 2449(d)(3).

State Tailpipe Emission Standards

To reduce emissions from offroad diesel equipment, on-road diesel trucks, and harbor craft, the ARB established a series of increasingly strict emission standards for new engines. New construction equipment used for the project, including heavy duty trucks, off-road construction equipment, tugboats, and barges, would be required to comply with the standards.

Local

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of Federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

The following local policies related to air quality may apply to implementation of the proposed project.

Feather River Air Quality Management District

The Feather River Air Quality Management District (FRAQMD) has jurisdiction over local air quality in Sutter County. Under the California CAA, FRAQMD is required to develop an air quality plan for nonattainment criteria pollutants in the air district. Counties in the Sacramento area (Sacramento, Yolo, Placer, El Dorado, Solano, Sutter, and Butte) have adopted the Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan (2009 Plan) (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2010). This plan outlines strategies to achieve the health-based O_3 standard. The Sacramento region is also in the process of developing a plan to address PM.

Butte County Air Quality Management District

The Butte County Air Quality Management District (BCAQMD) has jurisdiction over local air quality in Butte County. BCAQMD has adopted the 2009 Plan to address O_3 in the Sacramento Valley (see above). The air district also has developed measures to control PM, consistent with SB 656, and is developing a PM2.5 air quality attainment plan. The air district assisted in development of the 2004 Revisions to the California State Implementation Plan for Carbon Monoxide. This document was prepared by ARB and demonstrates that 10 nonattainment/maintenance areas, including the Chico urbanized area, attained the 8-hour CO standard between 1992 and 1995 and describes how these areas would continue to maintain compliance with the standard (California Air Resources Board 2004:1).

BCAQMD has specified significance thresholds in its CEQA Air Quality Handbook to determine air quality effects of projects located within district boundaries. BCAQMD has three levels of emission thresholds, and depending on the emissions produced from a proposed project, different mitigation measures are required. The thresholds are intended for operational emissions, but can be used to evaluate construction emissions if construction lasts longer than 12 months (Butte County Air Quality Management District 2008:2-2, 2-4).

3.5.2.2 Environmental Setting

The following considerations are relevant to air quality conditions in the proposed project area.

Climate and Meteorology

The project area is in Butte and Sutter Counties, which are located in the Sacramento Valley Air Basin (SVAB). The SVAB is bounded on the north by the Cascade Range, on the south by the San Joaquin Valley Air Basin, on the east by the Sierra Nevada, and on the west by the Coast Ranges.

The SVAB has a mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the North Pacific storm track intermittently dominates Sacramento Valley weather, and fair weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which are most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminish with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20°F to 115°F, with summer high temperatures often exceeding 90°F and winter low temperatures occasionally dropping below freezing.

In general, the prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduce the influx of outside air and allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The O_3 season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the Delta sea breeze arriving in the afternoon out of the southwest.

Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the *Schultz Eddy* prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento Valley and Yolo County. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating Federal or state standards. The eddy normally dissipates around noon when the Delta sea breeze arrives (Sacramento Metropolitan Air Quality Management District 2009:1-7).

Background Information on Air Pollutants

Air quality studies generally focus on five pollutants most commonly measured and regulated, and referred to as criteria air pollutants: O_3, CO, inhalable PM (PM10 and PM2.5), NO_2, and SO_2. Because O_3, a photochemical oxidant, is not emitted into the air directly from sources, emissions of O_3 precursors, including NO_X and ROG, are regulated with the aim of reducing O_3 formation in the lowermost region of the troposphere.

O_3 and NO_2 are considered regional pollutants because they (or their precursors) affect air quality on a regional scale: NO_2 reacts photochemically with ROG to form O_3, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as CO, PM10, and PM2.5 are considered to be local pollutants because they tend to disperse rapidly with distance from the source.

The principal characteristics surrounding these pollutants are discussed below. TACs are also discussed below, although no air quality standards exist for these pollutants.

Ozone

O_3 is an oxidant that attacks synthetic rubber, textiles, and other materials and causes extensive damage to plants by leaf discoloration and cell damage. It is also a severe eye, nose, and throat irritant and increases susceptibility to respiratory infections. O_3 is not emitted directly into the air; it forms from a photochemical reaction in the atmosphere. O_3 precursors, including ROG and NO_X, are emitted by mobile sources and stationary combustion equipment and react in the presence of sunlight to form O_3. Because reaction rates depend on the intensity of ultraviolet light and air temperature, O_3 is primarily a summertime problem.

Carbon Monoxide

CO is essentially inert to most materials and to plants but can significantly affect human health because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea and death. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter, when periods of light wind combine with the formation of ground-level temperature inversions—typically from evening through early morning. These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Particulate Matter

PM refers to finely divided solids or liquids, such as soot, dust, aerosols, and mists. Coarse PM with an aerodynamic diameter of 10 microns or less is referred to as PM10. A subgroup of finer particles that have an aerodynamic diameter of 2.5 microns or less is referred to as PM2.5. Suspended particulates aggravate chronic heart and lung disease problems, produce respiratory problems, and often transport toxic elements. They also absorb sunlight, producing haze and reducing visibility.

PM10 and PM2.5 in Sutter and Butte Counties are caused primarily by dust from grading and excavation activities, agricultural uses, and motor vehicles, particularly diesel-powered vehicles. These particles pose a greater health risk than larger particles because these fine particles can more easily penetrate the defenses of the human respiratory system. Chronic exposure to PM10 and PM2.5 can lead to respiratory disease and cause lung damage and cancer.

Nitrogen Dioxide

NO_2 is a brownish gas that contributes to the formation of ground-level O_3 pollution. NO_2 increases respiratory disease and irritation and may reduce resistance to certain infections. The majority of ambient NO_2 is not directly emitted but is formed rather quickly from the reaction of nitric oxide (NO) and oxygen in the atmosphere. NO and NO_2 are the primary pollutants that make up the group of pollutants referred to as NO_X. In the presence of sunlight, complex reactions of NO_X with O_3 and other air pollutants produce the majority of NO_2 in the atmosphere. NO_2 is one of the NO_X emitted from high-temperature combustion processes, such as those occurring in trucks, cars, and power plants. Indoors, home heaters and gas stoves also produce substantial amounts of NO_2.

Sulfur Dioxide

SO_2 is a colorless, irritating gas with a “rotten egg” smell, formed primarily by the combustion of sulfur-containing fossil fuels. SO_2 is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives and off-road diesel equipment. SO_2 also is emitted from several industrial processes, such as petroleum refining and metal processing.

Toxic Air Contaminants

TACs are pollutants that may result in an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body’s natural defense system, and diseases that lead to death. In 1998, following a 10-year scientific assessment process, ARB identified PM from diesel-fueled engines—commonly called diesel particulate matter (DPM)—as a TAC. Compared to other air toxics ARB has identified, DPM emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000:1).

Local Air Quality Conditions

The existing air quality conditions in the project area can be characterized by monitoring data collected in the region. The air quality monitoring station in Sutter County nearest to the project area is the Yuba City-Almond Street station, which is 1.5 miles from the levee in Yuba City. The nearest monitoring station in Butte County is the Gridley station, 2 miles west of the levee in Gridley. The Gridley station monitors only for exceedances of the state 1-hour O_3 standard. The next closest monitoring station in Butte County that measures all criteria pollutants is the Chico station, which is 25 miles from the northern boundary of the project site.

Table 3.5-2 summarizes air quality monitoring data from the Yuba City and Gridley monitoring stations for the last 3 years for which complete data are available (2007–2009). As shown in this table, both stations have experienced occasional violations of the state 1-hour O_3 and PM10 standards, and more frequent violations of the federal PM2.5 and state 8-hour O_3 standards.

Table 3.5-2. Ambient Air Quality Monitoring Data Measured at the Yuba City and Gridley Monitoring Stations

	Yuba City			Gridley		
Pollutant Standards	2007	2008	2009	2007	2008	2009
1-hour ozone (ppm)						
Maximum 1-hour concentration	0.095	0.092	0.089	0.94	0.111	0.080
1-hour California designation value	0.09	0.09	0.09	0.09	0.09	0.09
1-hour expected peak day concentration	0.090	0.091	0.087	0.090	0.094	0.088
Number of days standard exceeded[a]						
CAAQS 1-hour (>0.09 ppm)	1	0	0	0	2	0
8-hour ozone (ppm)						
National maximum 8-hour concentration	0.081	0.080	0.076	0.084	0.096	0.073
National second-highest 8-hour concentration	0.078	0.075	0.067	0.080	0.084	0.070
State maximum 8-hour concentration	0.082	0.080	0.077	0.084	0.097	0.073
State second-highest 8-hour concentration	0.078	0.075	0.068	0.080	0.084	0.071
8-hour national designation value	0.074	0.072	0.068	0.074	0.076	0.074
8-hour California designation value	0.082	0.082	0.080	0.084	0.084	0.083
8-hour expected peak day concentration	0.086	0.086	0.080	0.084	0.085	0.083
Number of days standard exceeded[a]						
NAAQS 8-hour (>0.075 ppm)	3	1	1	3	6	0
CAAQS 8-hour (>0.070 ppm)	6	2	1	10	14	2
Carbon monoxide (ppm)						
National[b] maximum 8-hour concentration	–	–	–	2.16	2.74	2.35
National[b] second-highest 8-hour concentration	–	–	–	2.16	2.39	1.99
California[c] maximum 8-hour concentration	–	–	–	2.16	2.74	2.35
California[c] second-highest 8-hour concentration	–	–	–	2.16	2.39	1.99
Maximum 1-hour concentration	–	–	–	3.3	3.1	–
Second-highest 1-hour concentration	–	–	–	2.8	3.0	–
Number of days standard exceeded[a]						
NAAQS 8-hour (≥9.0 ppm)	–	–	–	0	0	–
CAAQS 8-hour (≥9.0 ppm)	–	–	–	0	0	–
NAAQS 1-hour (≥35.0 ppm)	–	–	–	0	0	–
CAAQS 1-hour (≥20.0 ppm)	–	–	–	0	0	–

	Yuba City			Gridley		
Pollutant Standards	2007	2008	2009	2007	2008	2009
Particulate matter (PM10)[d] (μg/m³)						
National[b] maximum 24-hour concentration	51.0	66.9	50.7	61.9	143.5	48.2
National[b] second-highest 24-hour concentration	42.4	55.6	49.8	61.0	112.4	43.4
State[c] maximum 24-hour concentration	54.0	66.9	50.1	66.1	140.8	47.7
State[c] second-highest 24-hour concentration	45.6	57.0	49.1	65.0	111.6	45.9
State annual average concentration[e]	-	-	22.4	21.7	27.6	20.1
National annual average concentration	19.7	24.4	22.2	21.3	27.3	19.5
Number of days standard exceeded[a]						
NAAQS 24-hour (>150 μg/m³)[f]	0	0	0	0	0	0
CAAQS 24-hour (>50 μg/m³)[f]	1	4	0	2	6	0
Particulate matter (PM2.5) (μg/m³)						
National[b] maximum 24-hour concentration	45.0	127.3	41.8	53.9	107.6	35.1
National[b] second-highest 24-hour concentration	42.0	105.5	36.3	53.0	93.8	30.0
State[c] maximum 24-hour concentration	55.8	147.1	45.3	83.7	190.9	59.2
State[c] second-highest 24-hour concentration	52.7	124.6	44.0	70.2	180.1	54.2
National annual designation value	9.7	10.1	8.9	12.1	13.4	12.4
National annual average concentration	8.1	10.6	7.9	10.6	16.4	10.0
State annual designation value	11	15	15	15	18	18
State annual average concentration[e]	–	14.7	12.2	14.4	18.2	13.0
Number of days standard exceeded[a]						
NAAQS 24-hour (>35 μg/m³)[f]	8	10	2	24	37	0

Sources: California Air Resources Board 2011; U.S. Environmental Protection Agency 2009.

μg/m³ = micrograms per cubic meter.

CAAQS = California ambient air quality standards.

NAAQS = national ambient air quality standards.

ppm = parts per million.

– = insufficient data available to determine the value.

[a] An exceedance is not necessarily a violation.

[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using Federal reference or equivalent methods.

[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California approved samplers.

[d] Measurements usually are collected every 6 days.

[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

Air Quality Attainment Status

Local monitoring data (Table 3.5-2) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as follows.

- **Nonattainment**—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- **Maintenance**—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- **Attainment**—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- **Unclassified**—assigned to areas were data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3.5-3 summarizes the attainment status of the project area within Butte and Sutter Counties with regard to the NAAQS and CAAQS.

Table 3.5-3. Federal and State Attainment Status of the Project Area within Butte and Sutter Counties

	Project Area in Butte County		Project Area in Sutter County	
Pollutant	NAAQS	CAAQS	NAAQS	CAAQS
1-hour O_3	–	Moderate Nonattainment	–	Moderate Nonattainment
8-hour O_3	Marginal Nonattainment[a]	Nonattainment	Severe Nonattainment[b] /Attainment Unclassified[c]	Nonattainment-Transitional
CO	Moderate Maintenance[a]	Attainment	Attainment	Attainment
PM2.5	Nonattainment[a]	Nonattainment	Nonattainment[d]	Attainment
PM10	Attainment	Nonattainment	Attainment	Nonattainment

Sources: California Air Resources Board 2012; U.S. Environmental Protection Agency 2012.
– = No applicable standard.
CAAQS = California ambient air quality standards.
CO = carbon monoxide.
NAAQS = national ambient air quality standards.
O_3 = ozone.
PM2.5 = particulate matter less than 2.5 microns in diameter.
PM10 = particulate matter less than 10 microns in diameter.
[a] Designation applies to activities occurring under Contract D in the Chico urbanized area.
[b] Designation applies to activities occurring between Reaches 1 and 2 under Contract A.
[c] Designation applies to activities occurring between Reaches 3 through 25 under Contracts A, B, and C.
[d] Designation applies to activities occurring under Contracts A, B, and C.

Sensitive Receptors

Sensitive receptors are frequently occupied locations where people who might be especially sensitive to air pollution are expected to live, work, or recreate. These types of receptors include schools, churches, health care facilities, convalescent homes, and daycare centers. Table 3.5-4 lists

sensitive receptors that were identified in the project area. Of the overall 41-mile project length, most construction would be in rural areas where there are no sensitive receptors. All sensitive receptors listed in Table 3.5-4 are in the urbanized portions of Yuba City.

Table 3.5-4. Sensitive Receptors in the Project Area

Sensitive Receptor	Project Reach	Distance to Levee (feet)
Blackburn Talley Park	12	4,680
Day Care Yuba	13	2,000
Yuba City Rehabilitation Center	16	3,000
Yuba Skilled Nursing Center	16	2,500
Yuba City Swimming Pool	16	1,800
Praise Chapel	17	1,500
River City Network School	17	1,100
Christ Temple Church	18	250
Albert Powell School	18	1,000
Riverbend High School	18	2,000

3.5.3 Environmental Consequences

This section describes the environmental consequences relating to air quality for the proposed project. It describes the methods used to determine the effects of the proposed project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the proposed project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative. Because Alternatives 1 through 3 require mitigation measures to offset emissions, coordination with FRAQMD and BCAQMD staff was undertaken to ensure the mitigation measures, including available offsets are adequate from the air district's perspective. Confirmation via email from BCAQMD was received on March 28, 2013 indicating the BCAQMD had no substantial comments, while similar concurrence was received via voicemail from FRAQMD on March 29, 2013.

3.5.3.1 Assessment Methods

This evaluation of air quality is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of the proposed project.

Quantitative estimates of fugitive dust and tailpipe emissions during the levee construction project were forecast using construction activity data provided by HDR, SBFCA's professional engineering team, and using the Sacramento Roadway Construction Emission Model (SacRCEM) (version 7.1.2) (Sacramento Metropolitan Air Quality Management District 2012). In its CEQA guidance, FRAQMD directs that CEQA analyses use this model for analysis of air quality effects. BCAQMD suggests the use of URBEMIS in its CEQA guidance; however, in the interest of consistency in the analysis of this project, BCAQMD agreed to the use of SacRCEM. Detailed information on the emission calculation methods is provided in Appendix D. The following types of information were used, and are shown in Appendix D.

- The levee construction would occur in the years 2013–2015. The analysis presents an estimate of maximum daily emissions for each construction year, which corresponds to the periods in which multiple construction phases would occur simultaneously (typically July and August). Total annual emissions generated during each year of construction (2013–2015) are also presented.
- The type of each construction equipment, number of pieces of each type, and the duration of each type of construction activity. This information was provided by the HDR Engineering (2012). The forecast equipment usage is listed in Appendix D. The appendix lists the pieces of equipment for Construction Contracts A, B, and C within FRAQMD jurisdiction and for Construction Contract D within BCAQMD jurisdiction.
- Duration of each type of construction activity in each project segment. This information was provided by HDR (2012:1-40).
- Quantities of borrow material, spoil material, and supplies to be delivered to the project, for each project segment. This information was provided by HDR (2012).
- Number of employees for each project segment, each of whom was assumed to commute to the site in his or her own vehicle. This information was provided by HDR (2012).
- Default operating parameters for each type of construction equipment (horsepower, load factor and hours per day of usage) were set by the SacRCEM (Sacramento Metropolitan Air Quality Management District 2012).
- Default emission factors for non–road construction equipment, on-road delivery trucks, and on-road commute vehicles, were set by the SacRCEM.

3.5.3.2 Determination of Effects

For this analysis, an effect pertaining to air quality was analyzed based on professional practice and State CEQA Guidelines Appendix G (14 CCR 15000 et seq.). An effect was considered significant if it would result in one of the following conditions.

- Conflict with, or obstruct implementation of, the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area under NAAQS and CAAQS.
- Exceed thresholds of the federal general conformity regulation.
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

The appropriate district-recommended emission thresholds as published in their respective CEQA guidance documents also apply to individual projects under their jurisdiction.

3.5.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning air quality are summarized in Table 3.5-5.

Table 3.5-5. Summary of Effects for Air Quality

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1~~, 2,~~ and 3			
Effect AQ-1: Obstruction of an Applicable Air Quality Plan	Less than significant	None required	Less than significant
Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay ~~Required~~ Fees to FRAQMD and BCAQMD Sufficient to Offset Annual Construction NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Significant and unavoidable
Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment~~AQ-MM-5: Pay Required Fees to FRAQMD and BCAQMD to Offset Annual Construction NO_x Emissions to Net Zero (0)~~	Less than significant
Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10	Less than significant	None required	Less than significant
Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions	Less than significant	None required	Less than significant
Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust	Less than significant	None required	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Alternative 2			
Effect AQ-1: Obstruction of an Applicable Air Quality Plan	Less than significant	None required	Less than significant
Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay Fees to FRAQMD and BCAQMD Sufficient to Offset Annual Construction NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Significant and unavoidable
Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay Fees to FRAQMD and BCAQMD Sufficient to Offset Annual Construction NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Less than significant
Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10	Less than significant	None required	Less than significant
Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions	Less than significant	None required	Less than significant
Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust	Less than significant	None required	Less than significant

3.5.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no construction-related emissions from project implementation or maintenance.

Without improvements to the levee system, the risk of levee failure would remain high. Under these conditions, any of the levee deficiencies could cause portions of the levee to fail, triggering widespread flooding and extensive damage. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. Timing and duration of use would directly correlate with flood fighting needs, but it is likely that pollutants emitted would violate air quality standards for pollutants (including those for which the area is already considered nonattainment), increase air pollutant emissions, and expose sensitive receptors to toxic air emissions. Depending on the magnitude of the flood, flood fighting could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no BMPs to manage emissions would be in place. All of these effects could be considered significant. However, the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore a precise determination of significance is not possible.

3.5.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on air quality. These potential effects and related mitigation measure requirements are summarized in Table 3.5-6 and discussed below.

Table 3.5-6. Air Quality Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect AQ-1: Obstruction of an Applicable Air Quality Plan	Less than significant	None required	Less than significant
Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay ~~Required~~ Fees to FRAQMD and BCAQMD Sufficient to Offset NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Significant and unavoidable

Effect	Finding	Mitigation Measure	With Mitigation
Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment	Less than significant
Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10	Less than significant	None required	Less than significant
Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions	Less than significant	None required	Less than significant
Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust	Less than significant	None required	Less than significant

Effect AQ-1: Obstruction of an Applicable Air Quality Plan

A project is deemed inconsistent with an air quality plan if it would result in population or employment growth that exceeds the growth estimates in the applicable air quality plan—thus generating emissions not accounted for in the applicable air quality plan emissions budget. Consequently, proposed projects need to be evaluated to determine whether they would generate population and employment growth and, if so, whether that growth would exceed the growth rate included in the relevant air quality plan.

As described in Chapter 4, *Growth-Inducing and Cumulative Effects*, the implementation of flood risk-reduction measures would maintain or improve the level of ~~flood protection~~performance to the standard upon which county and city general plan growth has been based (i.e., 100-year) and for which effects have been analyzed associated with build-out. Therefore, the FRWLP would not conflict with or obstruct the implementation of air quality plans. This effect would be less than significant. No mitigation is required.

Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions

Without mitigation, construction-related emissions under the FRWLP would exceed CEQA emission thresholds for ROG, NO_X and PM10 in the FRAQMD and NO_X and PM10 thresholds in the BCAQMD, which would result in a significant effect. Mitigation Measures AQ-MM-1 through AQ-MM-5, described below, would help to reduce these effects.

Table 3.5-7 shows the construction emissions for Construction Contracts A, B, and C in FRAQMD's jurisdiction with and without these mitigation measures, and Table 3.5-8 shows the emission forecasts for Construction Contract D in BCAQMD's jurisdiction. After applying the mitigation measures, the maximum daily emissions would still exceed the ROG CEQA threshold in FRAQMD's jurisdiction. There would be no violations within BCAQMD's jurisdiction. Because ROG emissions would be in excess of FRAQMD's CEQA threshold, this effect would be significant and unavoidable after mitigation.

Table 3.5-7. Alternative 1 (Construction Contracts A, B, and C), Forecast Construction Emissions in FRAQMD Jurisdiction (2013–2015)

	Maximum Daily Emissions, lb/day[a]					
Analysis Year	ROG	NO_X	CO	PM10	PM2.5	CO_2
Maximum Daily Unmitigated Emissions						
2013	57	709	291	89	25	74,001
2014	150	2,023	763	191	60	225,207
2015	99	1,375	498	102	35	162,663
Maximum Daily Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[b]						
2013	57	592	291	27	10	74,001
2014	150	1,716	763	60	25	225,207
2015	99	1,173	498	34	15	162,663
Maximum Daily Emissions after Offsite Mitigation (AQ-MM-5)						
2013	57	<25	291	27	10	74,001
2014	150	<25	763	60	25	225,207
2015	99	<25	498	34	15	162,663
FRAQMD CEQA Threshold	25	25	NA	80	NA	NA
Exceeds Threshold (2013)?	Yes	No	NA	No	NA	NA
Exceeds Threshold (2014)?	Yes	No	NA	No	NA	NA
Exceeds Threshold (2015)?	Yes	No	NA	No	NA	NA

NA = not applicable.

[a] Maximum ROG, NO_X, CO, and CO_2 emissions typically occur between July and August, whereas maximum daily PM emissions occur between May and June.

[b] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

Table 3.5-8. Alternative 1 (Construction Contract D), Forecast Construction Emissions in BCAQMD Jurisdiction (2014–2015)

	Maximum Daily Emissions, lb/day[a]					
Analysis Year	ROG	NO_X	CO	PM10	PM2.5	CO_2
Maximum Daily Unmitigated Emissions						
2014	42	509	221	68	19	58,863
2015	40	487	215	67	19	58,730
Maximum Daily Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[b]						
2014	42	428	221	20	7	58,863
2015	40	408	215	19	7	58,730
Maximum Daily Emissions after Offsite Mitigation (AQ-MM-5)						
2014	42	<137	221	20	7	58,863
2015	40	<137	215	19	7	58,730
BCAQMD CEQA Threshold	137	137	NA	137	NA	NA
Exceeds Threshold (2014)?	No	No	NA	No	NA	NA
Exceeds Threshold (2015)?	No	No	NA	No	NA	NA

NA = not applicable.

[a] Maximum ROG, NO_X, CO, and CO_2 emissions typically occur between July and August, whereas maximum daily PM emissions occur between May and June.

[b] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

Mitigation Measure AQ-MM-1: Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents

SBFCA will provide advance written notification of the proposed construction activities to all residences and other air quality–sensitive uses within 500 feet of the construction site. Notification will include a brief overview of the proposed project and its purpose, as well as the proposed construction activities and schedule. It also will include the name and contact information of SBFCA's project manager or a representative for ensuring that reasonable measures are implemented to address a problem.

The construction contractor will post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of the appropriate air quality agency (FRAQMD or BCAQMD) also will be visible to ensure compliance with the agencies' regulations.

Mitigation Measure AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM2.5 Thresholds

The construction contractor will implement all applicable and feasible fugitive dust control measures required by FRAQMD and BCAQMD, including those listed below. This requirement will be incorporated into the construction contract.

- Prior to mobilizing to the job site the construction contractor will submit a dust control plan to FRAQMD and BCAQMD.
- Water active unpaved areas at all construction sites at least twice daily in dry conditions or more frequently as required, with the frequency of watering based on the type of operation, soil, and wind exposure.
- Prohibit all grading activities and water all areas of disturbed soil under windy conditions (more than 20 miles per hour).
- Limit onsite vehicles to a speed that prevents visible dust emissions to extend beyond unpaved roads.
- Cover all trucks hauling dirt, sand, or loose materials.
- Cover active and inactive storage piles where appropriate.
- Cover or hydroseed unpaved areas that will remain inactive for extended periods.
- Apply soil stabilizers to active and inactive areas where appropriate.
- Install wheel washers at the entrance to construction sites for all exiting trucks.
- Sweep streets if visible soil material is carried out from the construction site. Sweeping will be done at least once per day unless conditions warrant a more frequent application.
- Install wind fencing and phase grading operations where appropriate.

Fugitive dust emissions from the construction of the FRWLP would be reduced to a less-than-significant level with the implementation of the fugitive dust control measures listed above.

Mitigation Measure AQ-MM-3: General Measures to Reduce Emissions

The SBFCA will implement the following mitigation measures.

- No open burning of removed vegetation. Vegetative material will be chipped or delivered to waste or energy facilities.
- Develop a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites.
- Reduce use, trips, and unnecessary idling of heavy equipment. Shut down idling equipment that is not used for more than 5 consecutive minutes as required by California law.
- Construction equipment exhaust emissions will not exceed 40% opacity or Ringelmann 2.0. Operators of vehicles and equipment found to exceed opacity limits will take action to repair the equipment within 72 hours or remove the equipment from service.
- Maintain all construction equipment in proper tune according to manufacturer's specifications.
- Locate stationary diesel-powered equipment and haul truck staging areas as far as practical from sensitive receptors.
- Use existing power sources (e.g., power lines) or clean fuel generators rather than conventional diesel generators, when feasible.
- Substitute gasoline-powered for diesel-powered equipment when feasible.
- Portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, may require ARB Portable Equipment Registration with the state or a local district permit. The owner/operator will be responsible for arranging appropriate consultations with ARB or the air districts to determine registration and permitting requirements prior to equipment operation at the site.

Mitigation Measure AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment

Prior to mobilizing to the job site, the construction contractor will assemble a comprehensive inventory list (make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that will be used an aggregate of 40 or more hours for the construction project. The construction contractor then will apply the following mitigation measure to those pieces of equipment.

The construction contractor will provide a plan, for approval by FRAQMD and BCAQMD, demonstrating that the heavy-duty off-road equipment to be used at the project sites, including owned, leased, and subcontractor equipment, will achieve a project-wide fleet-average reduction of 20% for NO_X and 45% for DPM, compared to the most recent ARB fleet average at time of construction. SBFCA will use the construction mitigation calculator downloaded from the Sacramento Metropolitan Air Quality Management District web site (or similar tool approved by FRAQMD and BCAQMD) to perform the fleet average evaluation (Sacramento Metropolitan Air

Quality Management District 2009). Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology (Carl Moyer Guidelines), or installation of after-treatment emission control devices. FRAQMD and BCAQMD will be contacted to review and approve the alternative measures.

Mitigation Measure AQ-MM-5: Pay ~~Required~~ Fees to FRAQMD and BCAQMD Sufficient to Offset NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)

After implementing the general tailpipe emission control measures listed in AQ-MM-4 to reduce daily-average construction emissions, SBFCA will pay offsite mitigation fees to FRAQMD and BCAQMD to offset NO_X emissions. Emissions in excess of the federal *de minimis* thresholds shall be reduced to net zero (0). Emissions not in excess of the *de minimis* thresholds, but above applicable air district CEQA thresholds shall be reduced to quantities below the numeric thresholds.

Prior to issuance of grading permits for the project, SBFCA will consult with FRAQMD and BCAQMD to define the best construction information and the appropriate computational tools to be used for the calculations. SBFCA will submit calculations to FRAQMD and BCAQMD documenting the tons of NO_X to be offset over the duration of the construction phase of the project. SBFCA will consult with FRAQMD and BCAQMD to define the required fee payment based on the most recent Carl Moyer program cost value. Prior to the approval of project plans or the issuance of grading permits, the SBFCA will submit proof that the offsite air quality mitigation fee has been paid to FRAQMD and BCAQMD, and that the construction air quality mitigation plan has been approved by FRAQMD, BCAQMD, and SBFCA.

Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction

The FRWLP is subject to the Federal general conformity rule, which establishes applicability thresholds based on a region's attainment status with the NAAQS. As shown in Table 3.5-3, activities occurring under Contract D are located in an area currently designated moderate maintenance for the federal CO standard and marginal nonattainment for the federal 8-hour ozone standard. Activities occurring between Reaches 1 and 2 (Contract A) are located in an area designated severe nonattainment for the federal 8-hour ozone standard. The entire project area, including all activities under Contracts A through D, is designated a nonattainment area for the federal PM2.5 standard.

Table 3.5-9 compares annual construction emissions to the appropriate *de minimis* thresholds based on the regional nonattainment status. The emissions presented in Table 3.5-9 assume implementation of MM-AQ-1 through MM-AQ-4, as described under Effect AQ-2. As shown in Table 3.5-9, construction of Alternative 1 would not exceed applicable federal *de minimis* threshold for ROG, NO_X, CO, or PM2.5 for all construction years and activities. Consequently, General Conformity requirements are met as the action would not cause or contribute to new or worsening violations of the ambient air quality standards. No further conformity evaluation is required.

Table 3.5-9. Alternative 1, Annual Construction Emissions for 2013, 2014, and 2015 Compared to Applicable General Conformity Thresholds

	Contract D			Contract A		Contracts A–D
Analysis	ROG	NO_X	CO	ROG	NO_X	PM2.5
Annual Mitigated Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[a]						
2013	0	0	0	0	0	0
2014	1	14	8	2	15	2
2015	1	12	7	1	13	2
Attainment Status	Marginal Nonattainment	Marginal Nonattainment	Moderate Maintenance	Severe Nonattainment	Severe Nonattainment	Nonattainment
Applicable Threshold[b]	*100*	*100*	*100*	*25*	*25*	*100*
Exceed Threshold (2013)?	No	No	No	No	No	No
Exceed Threshold (2014)?	No	No	No	No	No	No
Exceed Threshold (2015)?	No	No	No	No	No	No

[a] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.
[b] Threshold based on the regional nonattainment status.

Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10

After the FRWLP is constructed, the facilities generally would be maintained as needed. Maintenance work would be less extensive and would take place over a few days per year. In addition, maintenance and operation activities are part of the existing environmental baseline and thus would not create a substantial source of new emissions. This effect would be less than significant. No mitigation is required.

Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions

Construction of the proposed project would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Particulate exhaust emissions from diesel-fueled engines (DPM) were identified as a TAC by ARB in 1998. Construction of the project would result in the generation of DPM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities.

The assessment of health risks associated with exposure to diesel exhaust typically is associated with chronic exposure, in which a 70-year exposure period often is assumed. However, while cancer can result from exposure periods of less than 70 years, acute exposure periods (i.e., exposure periods of 1–3 years) to diesel exhaust are not anticipated to result in an increased health risk, as health risks associated with exposure to diesel exhaust typically are seen in exposures periods that are chronic. Construction of the project is not expected to take place at the same construction site for more than 1 to 2 years, and the number of pieces of heavy equipment expected to be used at the same construction site would be limited. Furthermore, as required by ARB regulation, no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes.

This effect would be less than significant. In addition, implementation of Mitigation Measures AQ-MM-3 and AQ-MM-4 under Effect AQ-2 would further reduce exhaust emissions during construction. No further mitigation is required.

Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust

The proposed project would not result in any major sources of odor, nor would it involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, wastewater treatment facility). In addition, odors associated with diesel exhaust from the use of onsite construction equipment would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance.

Furthermore, as required by ARB regulation, no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes. Implementation of Mitigation Measures AQ-MM-1 through AQ-MM-5 under Effect AQ-2 would further reduce exhaust emissions during construction. This effect would be less than significant. No mitigation is required.

3.5.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on air quality. These potential effects and related mitigation measure requirements are summarized in Table 3.5-10 and discussed below.

Table 3.5-10. Air Quality Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect AQ-1: Obstruction of an Applicable Air Quality Plan	Less than significant	None required	Less than significant
Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay ~~Required~~ Fees to FRAQMD and BCAQMD Sufficient to Offset NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Significant and unavoidable

Effect	Finding	Mitigation Measure	With Mitigation
Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment ~~AQ-MM-5: Pay Required Fees to FRAQMD and BCAQMD~~ Sufficient ~~to Offset NO_x Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)~~	Less than Significant
Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10	Less than significant	None required	Less than significant
Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions	Less than significant	None required	Less than significant
Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust	Less than significant	None required	Less than significant

Effect AQ-1: Obstruction of an Applicable Air Quality Plan

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions

This effect would be similar to those described under Alternative 1, although the magnitude of the forecast emission rates during construction are slightly different. Without mitigation, construction-related emissions under the FRWLP would exceed CEQA emission thresholds for ROG, NO_X and PM10 thresholds in the FRAQMD and NO_X thresholds in the BCAQMD, which would result in a significant effect. Table 3.5-11 shows the construction emissions for Construction Contracts A, B, and C in FRAQMD's jurisdiction with and without these mitigation measures, and Table 3.5-12 shows the emission forecasts for Construction Contract D in BCAQMD's jurisdiction. After applying Mitigation Measures AQ-MM-1 through AQ-MM-5, the maximum daily emissions still would exceed the ROG and PM10 CEQA thresholds in the FRAQMD's jurisdiction. There would be no violations within BCAQMD's jurisdiction. Because ROG and PM10 emissions would be in excess of FRAQMD's CEQA threshold, this effect would be significant and unavoidable after mitigation.

Table 3.5-11. Alternative 2 (Construction Contracts A, B, and C), Forecast Construction Emissions in FRAQMD Jurisdiction (2013–2015)

	Maximum Daily Emissions, lb/day[a]					
Analysis Year	ROG	NO_X	CO	PM10	PM2.5	CO_2
Maximum Daily Unmitigated Emissions						
2013	75	1,200	347	345	101	131,244
2014	163	2,680	750	540	140	313,569
2015	125	2,001	579	224	63	243,437
Maximum Daily Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[b]						
2013	75	1,054	347	106	42	131,244
2014	163	2,363	750	148	47	313,569
2015	125	1,753	579	63	22	243,437
Maximum Daily Emissions after Offsite Mitigation (AQ-MM-5)						
2013	75	<25	347	106	42	131,244
2014	163	<25	750	148	47	313,569
2015	125	<25	579	63	22	243,437
FRAQMD CEQA Threshold	25	25	NA	80	NA	NA
Exceeds Threshold (2013)?	Yes	No	NA	Yes	NA	NA
Exceeds Threshold (2014)?	Yes	No	NA	Yes	NA	NA
Exceeds Threshold (2015)?	Yes	No	NA	No	NA	NA

NA = not applicable.

[a] Maximum ROG, NO_X, CO, and CO_2 emissions typically occur between July and August, whereas maximum daily PM emissions occur between May and June.

[b] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

Table 3.5-12. Alternative 2 (Construction Contract D), Forecast Construction Emissions in BCAQMD Jurisdiction (2014–2015)

	Maximum Daily Emissions, lb/day[a]					
Analysis Year	ROG	NO_X	CO	PM10	PM2.5	CO_2
Maximum Daily Unmitigated Emissions						
2014	28	380	122	107	28	38,144
2015	27	366	121	107	27	38,149
Maximum Daily Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[b]						
2014	28	321	122	29	9	38,144
2015	27	308	121	29	9	38,149
Maximum Daily Emissions after Offsite Mitigation (AQ-MM-5)						
2014	28	<137	122	29	9	38,144
2015	27	<137	121	29	9	38,149
BCAQMD CEQA Threshold	137	137	NA	137	NA	NA
Exceeds Threshold (2014)?	No	No	NA	No	NA	NA
Exceeds Threshold (2015)?	No	No	NA	No	NA	NA

NA = not applicable.

[a] Maximum ROG, NO_X, CO, and CO_2 emissions typically occur between July and August, whereas maximum daily PM emissions occur between May and June.

[b] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction

This effect would be similar to Alternative 1, except the magnitude of the emissions are different. The FRWLP is subject to the Federal general conformity rule, which establishes applicability thresholds based on a region's attainment status with the NAAQS. As shown in Table 3.5-3, activities occurring under Contract D are located in an area currently designated moderate maintenance for the federal CO standard and marginal nonattainment for the federal 8-hour ozone standard. Activities occurring between Reaches 1 and 2 (Contract A) are located in an area designated severe nonattainment for the federal 8-hour ozone standard. The entire project area, including all activities under Contracts A through D, is designated a nonattainment area for the federal PM2.5 standard.

Table 3.5-13 compares annual construction emissions to the appropriate *de minimis* thresholds based on the regional nonattainment status. The emissions presented in Table 3.5-13 assume implementation of AQ-MM-1 through AQ-MM-4, as described under Effect AQ-2. As shown in Table 3.5-13, construction of Contract A would exceed the federal *de minimis* threshold for NO_X. There would be no violations of any other *de minimis* thresholds. While ~~Since~~ Contract A emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination is not required because it has not been identified as the APA~~must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate ozone SIP for each year of construction under Contract A (2014–2015)~~. Consequently, because a general conformity determination is not required for Alternative 2 because it is not the APA, the general conformity determination that was included in Appendix D for Alternative 2 has been removed from this analysis.

~~As shown in Appendix D, USACE demonstrates that emissions generated by Contract A under Alternative 2 would not result in a net increase in regional NO_X emissions, as construction-related NO_X emissions would be fully offset to zero through implementation of AQ-MM-5. Based on the emissions levels estimated for Contract A and the current payment fee of $17,080 per ton of NO_X, total mitigation cost is expected to equal about $1.2 million. AQ-MM-5 will ensure the requirements of the mitigation and offset program are implemented, should Alternative 2 be selected as the APA.~~

Table 3.5-13. Alternative 2, Annual Construction Emissions for 2013, 2014, and 2015 Compared to General Conformity Thresholds

	Contract D			Contract A		Contracts A–D
Analysis	ROG	NO_X	CO	ROG	NO_X	PM2.5
Annual Mitigated Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[a]						
2013	0	0	0	0	0	1
2014	1	17	6	3	37	3
2015	1	16	6	3	35	2
Attainment Status	Marginal Nonattainment	Marginal Nonattainment	Moderate Maintenance	Severe Nonattainment	Severe Nonattainment	Nonattainment
Applicable Threshold[b]	*100*	*100*	*100*	*25*	*25*	*100*
Exceed Threshold (2013)?	No	No	No	No	No	No
Exceed Threshold (2014)?	No	No	No	No	Yes	No
Exceed Threshold (2015)?	No	No	No	No	Yes	No
AQ-MM-5 Required Fees[c]	0	0	0	0	71	0

NA = not applicable.

[a] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

[b] Threshold based on the regional nonattainment status.

[c] Fees are required to reduce pollutants in excess of *de minimis* thresholds to net zero (0).

Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

3.5.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on air quality. These potential effects and related mitigation measure requirements are summarized in Table 3.5-14 and discussed below.

Table 3.5-14. Air Quality Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect AQ-1: Obstruction of an Applicable Air Quality Plan	Less than significant	None required	Less than significant
Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment AQ-MM-5: Pay ~~Required~~ Fees to FRAQMD and BCAQMD Sufficient to Offset NO_X Emissions to Net Zero (0) for Emissions in Excess of General Conformity *de minimis* thresholds or to Quantities below Applicable FRAQMD and BCAQMD CEQA thresholds (where applicable)	Significant and unavoidable
Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction	Significant	AQ-MM-1 Provide Advance Notification of Construction Schedule and 24-Hour Hotline to Residents AQ-MM-2: Implement Fugitive Dust Control Plan If Unmitigated Emissions Exceed PM10 or PM 2.5 Thresholds AQ-MM-3. General Measures to Reduce Emissions AQ-MM-4: Fleet-Wide Emission Reductions for Large Off-Road Equipment	Less than significant
Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10	Less than significant	None required	Less than significant
Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions	Less than significant	None required	Less than significant
Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust	Less than significant	None required	Less than significant

Effect AQ-1: Obstruction of an Applicable Air Quality Plan

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

Effect AQ-2: Exceedance of Applicable Thresholds for Construction Emissions

This effect would be similar to those described under Alternative 1, although the magnitude of the forecast emission rates during construction are slightly different. Without mitigation, construction-related emissions under the FRWLP would exceed CEQA emission thresholds for ROG, NO_X and PM10 in the FRAQMD and NO_X thresholds in the BCAQMD, which would result in a significant effect. Table 3.5-15 shows the construction emissions for Construction Contracts A, B, and C in FRAQMD's jurisdiction with and without these mitigation measures, and Table 3.5-16 shows the emission forecasts for Construction Contract D in BCAQMD's jurisdiction. After applying the Mitigation Measures AQ-MM-1 through AQ-MM-5, the maximum daily emissions still would exceed the ROG CEQA threshold in FRAQMD's jurisdiction. There would be no violations within BCAQMD's jurisdiction. Because ROG emissions would be in excess of FRAQMD's CEQA threshold, this effect would be significant and unavoidable after mitigation.

Table 3.5-15. Alternative 3 (Construction Contracts A, B, and C), Forecast Construction Emissions in FRAQMD Jurisdiction (2013–2015)

	Maximum Daily Emissions, lb/day[a]					
Analysis Year	ROG	NO_X	CO	PM10	PM2.5	CO_2
Maximum Daily Unmitigated Emissions						
2013	40	530	192	89	24	54,359
2014	122	1,760	577	192	61	187,019
2015	90	1,235	417	103	37	149,098
Maximum Daily Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[b]						
2013	40	448	192	26	9	54,359
2014	122	1,731	577	60	26	187,019
2015	90	1,442	417	35	17	149,098
Maximum Daily Emissions after Offsite Mitigation (AQ-MM-5)						
2013	40	<25	192	26	9	54,359
2014	122	<25	577	60	26	187,019
2015	90	<25	417	35	17	149,098
FRAQMD CEQA Threshold	25	25	NA	80	NA	NA
Exceeds Threshold (2013)?	Yes	No	NA	No	NA	NA
Exceeds Threshold (2014)?	Yes	No	NA	No	NA	NA
Exceeds Threshold (2015)?	Yes	No	NA	No	NA	NA

NA = not applicable.

[a] Maximum ROG, NO_X, CO, and CO_2 emissions typically occur between July and August, whereas maximum daily PM emissions occur between May and June.

[b] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

Table 3.5-16. Alternative 3 (Construction Contract D), Forecast Construction Emissions in BCAQMD Jurisdiction (2014–2015)

	Maximum Daily Emissions, lb/day[a]					
Analysis Year	ROG	NO_X	CO	PM10	PM2.5	CO_2
Maximum Daily Unmitigated Emissions						
2014	29	388	132	127	31	38,243
2015	28	374	130	127	31	38,113
Maximum Daily Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[b]						
2014	29	325	132	34	10	38,243
2015	28	312	130	34	10	38,113
Maximum Daily Emissions after Offsite Mitigation (AQ-MM-5)						
2014	29	<137	132	34	10	38,243
2015	28	<137	130	34	10	38,113
BCAQMD CEQA Threshold	137	137	NA	137	NA	NA
Exceeds Threshold (2014)?	No	No	NA	No	NA	NA
Exceeds Threshold (2015)?	No	No	NA	No	NA	NA

NA = not applicable.

[a] Maximum ROG, NO_X, CO, and CO_2 emissions typically occur between July and August, whereas maximum daily PM emissions occur between May and June.

[b] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

Effect AQ-3: Exceedance of the Federal General Conformity Thresholds during Construction

This effect would be similar to Alternative 1, except the magnitudes of the emissions are different. The FRWLP is subject to the Federal general conformity rule, which establishes applicability thresholds based on a region's attainment status with the NAAQS. As shown in Table 3.5-3, activities occurring under Contract D are located in an area currently designated moderate maintenance for the federal CO standard and marginal nonattainment for the federal 8-hour ozone standard. Activities occurring between Reaches 1 and 2 (Contract A) are located in an area designated severe nonattainment for the federal 8-hour ozone standard. The entire project area, including all activities under Contracts A through D, is designated a nonattainment area for the federal PM2.5 standard.

Table 3.5-17 compares annual construction emissions to the appropriate *de minimis* thresholds based on the regional nonattainment status. The emissions presented in Table 3.5-17 assume implementation of MM-AQ-1 through MM-AQ-4, as described under Effect AQ-2. As shown in Table 3.5-17, construction of Alternative 3 would not exceed applicable federal *de minimis* threshold for ROG, NO_X, CO, or PM2.5 for all construction years and activities. Consequently, General Conformity requirements are met as the action would not cause or contribute to new or worsening violations of the ambient air quality standards. No further conformity evaluation is required.

Table 3.5-17. Alternative 3, Annual Construction Emissions for 2013, 2014, and 2015 Compared to Applicable General Conformity Thresholds

	Contract D			Contract A		Contracts A–D
Analysis	ROG	NO_X	CO	ROG	NO_X	PM2.5
Annual Mitigated Emissions after Onsite Mitigation (AQ-MM-1 through AQ-MM-4)[a]						
2013	0	0	0	0	0	0
2014	1	15	7	2	19	2
2015	1	13	6	2	16	2
Attainment Status	Marginal Nonattainment	Marginal Nonattainment	Moderate Maintenance	Severe Nonattainment	Severe Nonattainment	Nonattainment
Applicable Threshold[b]	*100*	*100*	*100*	*25*	*25*	*100*
Exceed Threshold (2013)?	No	No	No	No	No	No
Exceed Threshold (2014)?	No	No	No	No	No	No
Exceed Threshold (2015)?	No	No	No	No	No	No

NA = not applicable.

[a] Assumes a 20% reduction in NO_X, a 55% reduction in PM exhaust, and a 75% reduction in fugitive dust.

[b] Threshold based on the regional nonattainment status.

Effect AQ-4: Long-Term Operation and Maintenance Emissions of ROG, NO_X, and PM10

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

Effect AQ-5: Exposure of Sensitive Receptors to Toxic Air Emissions

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

Effect AQ-6: Exposure to Objectionable Odors from Diesel Exhaust

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

3.6 Climate Change and Greenhouse Gas

3.6.1 Introduction

This section describes the regulatory and environmental setting for climate change and greenhouse gases (GHGs); effects on climate change and GHGs that would result from the No Action Alternative and Alternatives 1, 2 and 3; and mitigation measures that would reduce significant effects. Additional information on GHG emission calculations is provided in Appendix E.

3.6.2 Affected Environment

This section describes the affected environment for climate change and GHGs in the project area. The key sources of data and information used in the preparation of this section are listed below.

- California Air Resources Board.
- Intergovernmental Panel on Climate Change (IPCC).
- U.S. Environmental Protection Agency.
- Western Regional Climate Center.

3.6.2.1 Regulatory Setting

This section summarizes key Federal, state, and local regulatory information that applies to climate change and GHGs. Additional regulatory information appears in Appendix A.

Federal

Although there is currently no Federal overarching law or policy related to climate change or the regulation of GHGs, recent activity suggests that regulation may be forthcoming. Foremost among recent developments has been the U.S. Supreme Court's decision in Massachusetts et al. v. EPA, the Endangerment Finding, and Cause or Contribute Finding, which are described in Appendix A. Despite these findings, the future of GHG regulations at the Federal level is still uncertain. EPA regulation may be preempted by congressional action, should a cap-and-trade bill be passed prior to adoption of EPA regulation. The following text summarizes the 2010 Draft NEPA guidance related to climate change and GHG emissions.

Draft NEPA Guidance on Consideration of the Effects of Climate Change and GHG Emissions (2010)

On February 18, 2010, Nancy Sutley, chair of the CEQ, issued a memorandum providing guidance on consideration of the effects of climate change and GHG emissions under NEPA. The draft guidance suggests that the effects of projects directly emitting GHGs in excess of 25,000 tons annually be considered in a qualitative and quantitative manner. The CEQ does not propose this reference as a threshold for determining significance, but as "a minimum standard for reporting emissions under the CAA." The draft guidance also recommends that the cumulative effects of climate change on the proposed project be evaluated. The draft guidance is still undergoing public comments and will not be effective until issued in final form(Council on Environmental Quality 2010).

State

The State of California has adopted legislation, and regulatory agencies have enacted policies, addressing various aspects of climate change and GHG emissions mitigation. Much of this legislation and policy activity is not directed at citizens or jurisdictions but rather establishes a broad framework for the state's long-term GHG mitigation and climate change adaptation program. The Governor has issued several executive orders (EOs) related to the state's evolving climate change policy that are summarized in Appendix A.

Assembly Bill 32—The California Global Warming Solutions Act (2006)

Assembly Bill (AB) 32 codified the state's GHG emissions target by requiring that the state's GHG emissions be reduced to 1990 levels by 2020. Since AB 32 was adopted, ARB, California Energy Commission (CEC), California Public Utilities Commission (CPUC), and Building Standards Commission have been developing regulations that will help meet the goals of AB 32 and EO S-03-05. The Scoping Plan for AB 32, developed by ARB as part of the requirements of AB 32, identifies specific measures and actions to reduce GHG emissions to 1990 levels by 2020 and requires ARB and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs.

Climate Change Scoping Plan

On December 11, 2008, pursuant to AB 32, ARB adopted the Climate Change Scoping Plan. This plan outlines how emissions reductions from significant sources of GHGs will be achieved via regulations, market mechanisms, and other actions. Six key elements, outlined in the scoping plan, are identified to achieve emissions reduction targets.

- Expanding and strengthening existing energy efficiency programs and building and appliance standards.
- Achieving a statewide renewable energy mix of 33%.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system.
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high–global warming potential (GWP) gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

The Climate Change Scoping Plan also described recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the effects of the reductions are equitable and do not disproportionately affect low-income and minority communities. These measures put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80% below 1990 levels.

Local

Sutter County

The FRAQMD, which regulates local air policy in Sutter and Yuba Counties, has not adopted rules or regulations establishing limits on GHG emissions from specific projects or thresholds of significance for GHG emissions at the project level. However, the FRAQMD CEQA Handbook does require preliminary documents to address whether a project would (1) "generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment" and (2) conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions (Feather River Air Quality Management District 2010).

The Sutter County General Plan intends to complete a Climate Action Plan (CAP) consistent with AB 32 goals to establish strategies to reduce GHG emissions from sources under the county's jurisdiction, which includes the cities of Live Oak and Yuba City, located in the planning area (Sutter County 2010a).

Butte County

BCAQMD has not adopted rules or regulations establishing limits on GHG emissions from specific projects or thresholds of significance for GHG emissions at the project level. While the BCAQMD CEQA Handbook does include a brief discussion about consistency with AB 32, the general effects of climate change, and the GHG policy guidance from CAPCOA, the District only recommends that a qualitative discussion of GHGs be included for air quality analyses of "sizable projects"(Butte County Air Quality Management District 2008).

Butte County addresses GHG emissions and climate change in a variety of policies and programs throughout their 2030 general plan (Butte County 2010a). The County has expressed a commitment toward reducing its effect on climate change. This commitment is extended to the cities under Butte County jurisdiction, including Biggs and Gridley, which are located in the planning area.

City of Yuba City (Sutter County)

FRAQMD has jurisdiction over air quality and GHG emissions in Sutter County, which includes Yuba City. Further details on FRAQMD's treatment of GHG emissions are described under Sutter County regulations above.

GHG emissions and climate change are not addressed in the City of Yuba City's most recent general plan.

City of Live Oak (Sutter County)

FRAQMD has jurisdiction over air quality and GHG emissions in Sutter County, which includes the city of Live Oak. Further details on FRAQMD's treatment of GHG emissions are described under Sutter County regulations above.

The City of Live Oak 2030 General Plan acknowledges the potential effects and sources of GHGs as a component of air quality as well as the City's role in the fulfillment of AB 32 under Implementation Program Air-1 (City of Live Oak 2010). Under the Key Issues in the general plan, Live Oak will manage land use and transportation planning efforts in accordance with the state's GHG-reduction goals. As a part of their general plan implementation, Live Oak will account for the effects of land

use, conservation, and other general plan measures in their citywide GHG reduction target (City of Live Oak 2010).

City of Biggs (Butte County)

BCAQMD has jurisdiction over air quality and GHG emissions in Butte County, which includes the city of Biggs. Further details on BCAQMD's treatment of GHG emissions are described under Butte County regulations above. The City of Biggs has not adopted rules or regulations establishing limits on GHG emissions from specific projects or thresholds of significance for GHG emissions at the project level. GHG emissions are not addressed in the City of Biggs General Plan 1997–2015 (City of Biggs 1998). The update of the Biggs general plan began in 2009 and is underway. The general plan update likely will address GHG emissions and climate change issues considering the AB 32 mandate.

City of Gridley (Butte County)

BCAQMD has jurisdiction over air quality and GHG emissions in Butte County, which includes the city of Gridley. Further details on BCAQMD's treatment of GHG emissions are described under Butte County regulations above. The City's Code of Ordinances does not contain ordinances directed specifically at GHG emissions; however, Gridley's 2030 general plan includes an appendix that outlines more than 200 specific local policies that can be implemented to mitigate GHG emissions or adapt to climate change (City of Gridley 2010). These policies span nearly all sectors of GHG emission sources, including land use, transportation, building energy use, water supply, and solid waste. The Gridley general plan also considers agriculture and flooding safety concerns in regard to climate change adaptation.

3.6.2.2 Environmental Setting

The following considerations are relevant to climate change and GHG conditions in the proposed project area.

Background Information on Climate Change

Global warming refers to the increase in the average temperature of the earth's near-surface air and oceans since the mid-twentieth century and its projected continuation. Warming of the climate system is now considered to be unequivocal (Intergovernmental Panel on Climate Change 2007), with global surface temperature increasing approximately 1.33°F over the last 100 years. Continued warming is projected to increase the average global temperature between 2°F and 11°F over the next 100 years. The causes of this warming have been identified as both natural processes and the result of human actions. IPCC concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. However, after 1950, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase.

Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. Some GHGs occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is

reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

The principal GHGs are CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor. Each of the principal GHGs has a long atmospheric lifetime (1 year to several thousand years). In addition, the potential heat-trapping ability of each of these gases varies significantly. CH_4 is 23 times as potent as CO_2, while SF_6 is 22,200 times more potent than CO_2. The most common GHG is CO_2, which constitutes approximately 84% of all emissions of GHGs in California. GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and TACs, which are pollutants of regional and local concern.

Conventionally, GHGs have been reported as CO_2e, an equivalency measure that takes into account the relative potency of non-CO_2 GHGs and converts their quantities to an equivalent amount of CO_2 so that all emissions can be reported as a single quantity. The primary human-made processes that release these gases include burning of fossil fuels for transportation, heating, and electricity generation; agricultural practices that release CH_4 such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high global warming potential gases such as SF_6, PFCs, and HFCs. Deforestation and land cover conversion also have been identified as contributing to global warming by reducing the earth's capacity to remove CO_2 from the air and altering the earth's albedo or surface reflectance, allowing more solar radiation to be absorbed.

GHGs trap infrared radiation emitted from the earth's surface, which otherwise would be reflected into space. Anthropogenic emissions of GHGs, resulting in ambient concentrations outside of what can be considered the natural range, are thought to be responsible for the enhancement of the natural greenhouse effect or global warming. A warmer lower atmosphere induces changes in weather patterns and increased sea levels as a result of the melting of ice in the polar regions. This phenomenon is often referred to as *climate change*.

The IPCC lists CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 as six of the major GHGs from anthropomorphic sources. These gases are also listed under the CAA and AB 32. A brief description of the sources of each GHG follows.

Carbon Dioxide

Carbon dioxide (CO_2) is the most abundant anthropogenic GHG and accounts for more than 75% of all anthropogenic GHG emissions. Its long atmospheric lifetime (on the order of decades to centuries) ensures that atmospheric concentrations of CO_2 will remain elevated for decades after GHG mitigation efforts (Intergovernmental Panel on Climate Change 2007) are promulgated.

Primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), cement production, and land use changes, including deforestation. CO_2 emissions attributable to the burning of fossil fuels represent nearly 60% of worldwide GHG emissions, 23% of which is from transportation.

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP 21 times that of CO_2 (Intergovernmental Panel on Climate Change 1996). Anthropogenic emissions of CH_4 are

the result of anaerobic emissions from rice paddies, cattle enteric fermentation, combusting natural gas, landfilled waste, and mining coal (National Oceanic and Atmospheric Administration 2005).

Nitrous Oxide

N_2O is a powerful GHG, with a global warming potential 310 times that of CO_2 (Intergovernmental Panel on Climate Change 2007). One of the major sources of N_2O is from biological decomposition and agriculture, such as from manure and fertilizer application. N_2O is also a by-product of vehicle emissions and fuel-fired power plants.

High–Global Warming Potential Gases

High-GWP gases such as HFCs, PFCs, and SF_6 are human-made chemicals used in a variety of industries and applications such as refrigeration (HFCs), aluminum production (PFCs), and electricity transmission (SF_6). Some of these gases have GWP several orders of magnitude greater than CO_2 and can persist in the atmosphere for millennia. SF_6 is the most powerful of the GHGs listed in the IPCC studies, with a GWP of 23,900 (Intergovernmental Panel on Climate Change 2007).

Global Climate Trends and Associated Effects

The rate of increase in global average surface temperature over the last 100 years has not been consistent; the last three decades have warmed at a much faster rate—on average 0.32 degrees Fahrenheit (°F) per decade. Eleven of the 12 years from 1995 to 2006 rank among the twelve warmest years in the instrumental record of global average surface temperature (going back to 1850) (Intergovernmental Panel on Climate Change 2007).

During the same period over which this increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen on average 1.8 millimeters per year; precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; tropical cyclone activity in the North Atlantic has increased; peak runoff timing of many glacial and snow-fed rivers has shifted earlier; and numerous other observed conditions. Although it is difficult to prove a definitive cause-and-effect relationship between global warming and other observed changes to natural systems, there is high confidence in the scientific community that these changes are a direct result of increased global temperatures (Intergovernmental Panel on Climate Change 2007).

The planning area is located in the eastern half of the Sacramento Valley Air Basin, about 16 miles west of the Sierra Nevada. This area typically experiences cold winters and hot dry summers. In 2010 temperatures in the Sutter-Butte area ranged from an average winter low of 37°F to an average summer high of 91°F[1] , compared to the historical average winter low of 35°F and an average summer high of 95°F[2] (Western Regional Climate Center 2011). Precipitation falls predominantly as rain in the region. The Sacramento Valley in the Sutter-Butte region generally experiences south-southeasterly winds with average speeds ranging 5–7 miles per hour[3] (Western

[1] Recorded for the city of Oroville, closest approximation for 2010 data (winter low in December, summer high in July) (Weather Underground 2011).

[2] Values were based on Western Regional Climate Center historical data from a monitoring station in Gridley. Most recent historical data is the average of data from 1893 to 1955. This is the most central monitoring station in the project area. Map (Western Regional Climate Center 2006a).

[3] For the closest recorded locations of Oroville Municipal Airport and Marysville Municipal Airport.

Regional Climate Center 2002, 2006b). Temperature, precipitation, and wind data as recorded in 2010 at local weather stations as well as historical ranges are summarized in Table 3.6-1.

Table 3.6-1. Sutter-Butte Region Average Temperature and Precipitation

	Average Winter Low (°F)	Average Summer High (°F)	Annual Precipitation (Rainfall) (inches)	Wind Speed (mph)
2010 (Oroville, CA) (Weather Underground 2010)	37	95	31.6	6
2000–2008 (Oroville, CA) (Western Regional Climate Center 2009)	39	95	23.6	6.1
1971–2000	36.7	95.2	30.53	NA
1961–1990	36.8	96.2	28.49	NA

mph = miles per hour.
NA = not applicable.

California Climate Trends

Maximum (daytime) and minimum (nighttime) temperatures are increasing almost everywhere in California but at different rates. The annual minimum temperature averaged over all of California increased 0.33°F per decade from 1920 to 2003, while the average annual maximum temperature increased 0.1°F per decade (Moser et al. 2009).

With respect to California's water resources, the most significant effects of global warming have been changes to the water cycle and sea level rise. Over the past century, the precipitation mix between snow and rain has shifted in favor of more rainfall and less snow (Mote et al. 2005; Knowles 2007) and snowpack in the Sierra Nevada is melting earlier in the spring (Kapnick and Hall 2009). The average early spring snowpack in the Sierra Nevada has decreased by about 10% during the last century, a loss of 1.5 million acre-feet of snowpack storage (California Department of Water Resources 2008). These changes have significant implications for water supply, flooding, aquatic ecosystems, energy generation, and recreation throughout the state. During the same period, sea levels along California's coast rose 7 inches (California Department of Water Resources 2008). Sea level rise associated with global warming will continue to threaten coastal lands and infrastructure, increase flooding at the mouths of rivers, place additional stress on levees in the Delta, and will intensify the difficulty of managing the Delta as the heart of the state's water supply system.

GHG emissions for the state of California in 2008 were 473.76 million metric tons (MT) CO_2e (carbon dioxide equivalent) (California Air Resources Board 2010). Data for 2010 are not yet available, and 2008 emissions data are considered a valid approximation for conditions in 2010. California population in 2008 was 37.9 million, resulting in emissions of 12.5 MT CO_2e per capita[4,5]. The largest single source (37%) of these emissions was from transportation, with 25% from electricity generation, 21% from industrial sources, and 6% from residential emissions (California

[4] Total GHG emissions in 2008 in California (California Air Resources Board 2010) divided by total population in 2008 (37.8 Million): <http://www.dof.ca.gov/research/demographic/reports/estimates/e-4_2001-07/>.

[5] The most recent emissions inventory for California was published in 2010 by ARB, but gives 2008 values (California Air Resources Board 2010). We assumed that 2010 state-wide per capita emissions to have an insignificant change from 2008.

Air Resources Board 2010; California Department of Finance 2010). Emissions from electricity generation are generally lower than the national average because of California's temperate climate and minimal usage of coal (California Energy Commission 2010). Emissions from residential and industrial sectors are attributable primarily to onsite combustion of fossil fuels (natural gas) for heating or cooking.

GHG inventories typically are performed at the city, county, or air district level, and thus an exact overlap of the affected area with an existing GHG inventory is not possible. GHG emissions in the region are discussed generally based on the 2006 GHG emissions inventory of Butte County, the only jurisdiction in the affected area to have completed a GHG inventory (Butte County 2010b). Approximately 50% of the project area is located in Butte County, and the general pattern of emissions and dominant emissions sources in Butte County was considered to be representative of emissions in Sutter County, city of Biggs, city of Gridley, Yuba City and Live Oak. Per capita emissions in the unincorporated portions of Butte County in 2006 were 6.68 MT CO_2e per person, similar to and somewhat lower than nearby cities of comparable populations such as Citrus Heights, Folsom, and Rancho Cordova that have per capita GHG emissions of 6.4, 8.4, and 9.9, respectively (Sacramento County Department of Environmental Review and Assessment 2009). Butte County's inventory may underestimate per capita emissions as the inventory does not fully account for emissions associated with agriculture, a major industry in the county.

Sources of GHG emissions in Butte County include on-road transportation (49.2%), electricity usage (17.8%), agricultural vehicles and equipment (12.8%), natural gas (10.3%), off-road vehicles and equipment (6.8%), landfills (2.4%), and stationary sources (0.7%).The sources and pattern of emissions throughout the region are expected to be similar to those in Butte. Similar to the pattern of emissions at the state level, on-road vehicle travel, building energy use, and agricultural activities are the largest sources of GHG emissions in the affected area (Butte County 2010a).

GHG emissions from agriculture, especially from rice production, are a unique characteristic of the affected area. Agricultural land makes up the vast majority of the affected area and is also a significant economic focus in both counties. In 2010, agriculture accounted for 86% of Sutter County's land and 20% of the total economic output from Sutter County industries (Sutter County 2010a:4-1)[6]. In 2009, rice accounted for 46% and 28% of harvested agricultural land in Sutter and Butte Counties, respectively. Rice was also the most valuable harvested crop in the area with total revenue of $184 million to $224 million in 2009. Rice cultivation results in considerably higher levels of GHGs compared to other crops because of the need to fully inundate crops. Perpetually flooded environments allow the anaerobic fermentation of soil organic matter and the release of CH_4. Because of the significant acreage devoted to rice production in the affected area and because CH_4 has a GWP 21 times that of CO_2, agriculture likely represents a significant source of emissions in the affected area (Sutter County 2010b; Butte County 2010c).

Existing ~~Flood Control~~Flood Risk Management Activities

Existing ~~flood control~~flood risk management activities in the project area include routine levee repairs, annual vegetation management, periodic well improvements, and monitoring. Activities that involve the use of heavy-duty equipment (e.g., tractors, graders,) combust fossil fuel, thereby generating CO_2 emissions (and some CH_4 emissions depending on the fuel type). In addition, employee travel to conduct routine repairs and inspections would generate GHG emissions. Some

[6] This information was not available for Butte County.

portion of these emissions is captured in the GHG inventory for Butte County detailed in the previous section. Emissions from equipment and vehicles associated with routine maintenance and operations of existing ~~flood control~~flood risk management infrastructure are likely a very small fraction of regional emissions.

Other existing ~~flood control~~flood risk management activities consist of current adopted plans and strategies regarding ~~flood control~~flood risk management. In particular, DWR has published a white paper regarding the impact of climate change on California's water in 2008 and an ensuing CVFPP in 2012.

Central Valley Flood Protection Plan

In 2012, DWR published the CVFPP. This plan laid out the levee and other flood risk management ~~protection~~ strategies to protect the affected residents and resources of the Central Valley. The CVFPP includes a discussion of the impacts of climate change to flood protection, and acknowledges that climate change would result in higher flood flows and sea levels. The CVFPP proposes that widening bypasses to lower floodwater surface elevations would increase flow-carrying capacity and flexibility to deal with higher flood flows that may occur because of climate change. Sea level rise will also affect the levee system in the Delta and rivers upstream of the Delta. (Cowin et al. 2012:3-22, 23, 24.)

Some major elements of preliminary approaches to flood risk management~~protection~~ in the Central Valley include constructing new bypasses and expanding existing ones, increasing reservoir storage and utilization of forecast-based reservoir operations, improving major flood structures such as weirs and gates, and improvements to affected levees protecting both rural and urban communities. These flood management elements and related projects are designed to achieve the State Plan of Flood Control design flow capacity, protect high risk communities, or enhance flood system capacity. (Cowin et al. 2012: Table 2-1.)

DWR is also developing a new methodology for estimating the impacts of climate change on flood hydrology, which involves measuring the intensity of "Atmospheric Rivers" that bring seasonal moisture and rains into the Central Valley. With improved climate change data, the DWR can better manage the effects of climate change, such as higher flood flows, and perform better suited regional plans and feasibility studies. (Cowin et al. 2012:3-22, 23, 24.)

Climate Change Adaptation Strategies for California's Water

As identified in the Programmatic EIR for the CVFPP, DWR developed and adopted a series of climate adaptation strategies for State and local water managers to improve their capacity to handle climate change. Their report, entitled *Climate Change Adaptation Strategies for California's Water* (CCASCW), identifies the following strategies applicable to ~~flood control~~flood risk management (California Department of Water Resources 2008).

- Strategy 2—Fully Develop the Potential of Integrated Regional Water Management
  - Link the flood protection system with the water supply system, as well as to identify opportunities for reservoir reoperation in conjunction with groundwater flood storage.
- Strategy 4—Practice and Promote Integrated Flood Management
  - Practice integrated flood management using a variety of structural and nonstructural approaches to achieve multiple goals and objectives from a system-wide perspective:

reducing flood risks and consequences, reducing long-term system maintenance requirements, and improving system-wide riverine ecosystem functions, groundwater storage, recreation, and hydropower. Features or actions would be incorporated to accommodate for hydrologic uncertainty, including that caused by climate change.

- Strategy 5—Enhance and Sustain Ecosystems
  - Promote ecosystem functions by incorporating flood management system improvements that integrate the recovery and restoration of key physical processes, self-sustaining ecological functions, native habitats, and species, including conservation strategies to improve the quantity, biotic diversity, and connectivity of riparian, wetland, floodplain, and emergent and shaded riverine aquatic habitats.
- Strategy 6—Expand Water Storage and Conjunctive Management of Surface and Groundwater Resources
  - Identify opportunities for reservoir reoperation in conjunction with groundwater flood storage, as mentioned above.
- Strategy 7—Fix Delta Water Supply, Quality, and Ecosystem Conditions
  - Protect the lands of the Delta from flooding, which would result in improved water quality.
- Strategy 9—Plan for and Adapt to Sea Level Rise
  - Factor climate change into the design and planning of the CCASCW.

In addition, DWR has adopted a Sustainability Policy to promote changes in their business and operational practices. The Sustainability Policy, which applies only to DWR activities, affects facilities, vehicle fleets, recycling and waste management in DWR buildings, and environmental preferable procurement, among other efforts. Furthermore, DWR has established quantitative goals for sustainability that relate to carbon emissions, water, wastewater, energy, and waste. Specifically, sustainability targets of achieving an emissions level of 50 percent below 1990 levels by 2020 and 80 percent below 1990 levels by 2050 have been established for DWR operations. (California Department of Water Resources 2012: 3.7-31,32; California Department of Water Resources 2008, 2013.)

3.6.3 Environmental Consequences

This section describes the environmental consequences relating to climate change for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with and without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.6.3.1 Assessment Methods

This evaluation of GHG emissions and climate change is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

Quantitative estimates of GHG emissions during the levee construction project were forecast using construction activity data provided by HDR Engineering, SBFCA's professional engineering firm, and by using default emission factors from the SacRCEM (Sacramento Municipal Air Quality Management District 2012). Detailed information on the emission calculation methods is provided in Appendix E. The following types of information were used, and are shown in Appendix E.

- Duration of each type of construction activity in each project segment. This information was provided by the HDR Engineering (HDR 2012; pp1-40).
- Type of each construction equipment and number of pieces of each type, during each type of construction activity. This information was provided by HDR Engineering (HDR 2012).
- Quantities of borrow material, spoil material, and supplies to be delivered to the project, for each project segment. This information was provided by HDR Engineering (HDR 2012).
- Default operating parameters for each type of construction equipment (horsepower, load factor and hours per day of usage) derived from the SacRCEM (Sacramento Municipal Air Quality Management District 2012).
- Default emission factors for fuel consumption and GHG emission rates (CO_2 and CH_4) for non–road construction equipment, on-road delivery trucks, and on-road commute vehicles, derived from the SacRCEM.

3.6.3.2 Determination of Effects

For this analysis, an effect pertaining to climate change was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice. An effect was considered significant if it would:

- Generate GHG emissions that exceed thresholds.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.
- Fail to address changes in flood frequency and floodwater elevation caused by global climate change.

None of the counties or air quality agencies with jurisdiction over this project has developed its own numerical CEQA thresholds for GHG emissions. Therefore, a project-specific numerical GHG emission threshold of 7,000 tons per year of CO_2e was derived for this project by reviewing the appropriate CEQA thresholds for commercial and industrial projects that have been developed recently by other jurisdictions in California. They are listed below.

- Bay Area Air Quality Management District: 25,000 tons/year.
- South Coast Air Quality Management District: 10,000 tons/year.
- ARB: 7,000 tons/year.
- Santa Barbara County Air Quality Management District: 10,000 tons/year.
- San Diego County: 990 tons/year.
- Sacramento County Air Quality Management District: No single threshold, effects are set using unit-based thresholds (e.g., 7.8 tons per year per 1,000 square feet of commercial development).

- San Joaquin Valley Air Pollution Control District: no *de minimis* threshold. All applicants are required to use BMPs to reduce emissions by 28% compared to Business As Usual.

Based on the above listing, the project-specific GHG emission threshold of 7,000 tons per year was deemed to be most appropriate for this type of project. That threshold applies to the annualized emissions over the life of the levee project. The design life of the levee is 50 years. Therefore, the initial construction-phase GHG emissions were divided by the 50-year project lifetime to derive the annualized emissions for comparison to the threshold.

3.6.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning climate change and GHGs are summarized in Table 3.6-2.

Table 3.6-2. Summary of Effects for Climate Change and Greenhouse Gas

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold	Less than significant	CC-MM-1: Implement Measures to Minimize GHG Emissions during Construction	Less than significant
Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs	Less than significant	None required	Less than significant
Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change	Less than significant	None required	Less than significant

GHG = greenhouse gas.

3.6.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions.

Under the No Action Alternative, construction emissions related to the current maintenance and operation regime would remain the same. Emissions as a result of ongoing levee maintenance would not be substantial. However, without improvements to the levee system, levees may not be able to withstand future changes in river flows caused by climate change, and the risk of levee failure would remain high. Under these conditions, any of the levee deficiencies could cause portions of the levee to fail, triggering widespread flooding and extensive damage. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. Timing and duration of use would directly correlate with flood fighting needs, but it is likely that pollutants emitted would violate air quality standards for pollutants (including those for which the area is already considered nonattainment) and increase GHG emissions. Depending on the magnitude of the flood, flood fighting could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no BMPs to manage emissions would be in place. All of these effects could be considered significant. However,

the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore a precise determination of significance is not possible.

3.6.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on climate change and GHGs. These potential effects and related mitigation measure requirements are summarized in Table 3.6-3 and discussed below.

Table 3.6-3. Climate Change Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold	Less than significant	CC-MM-1: Implement Measures to Minimize GHG Emissions during Construction	Less than significant
Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs	Less than significant	None required	Less than significant
Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change	Less than significant	None required	Less than significant

GHG = greenhouse gas.

Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold

Neither FRAQMD nor BCAQMD formally adopted GHG thresholds for projects such as the FRWLP. Therefore, a presumptive threshold of 7,000 MT per year (the lowest threshold of any formally adopted GHG threshold) is compared against the CO_2 emissions for the FRWLP. As noted in Table 3.6-4, the CO_2 emissions project-wide without mitigation would be only 398 tons per year, annualized over the 50-year levee lifespan. Within FRAQMD and BCAQMD, respectively, CO_2 emissions without mitigation would be 325 tons per year and 73 tons per year. These emissions are well below the presumptive threshold, so the effects of GHG emissions during construction are considered less than significant. However, before BCAQMD and FRAQMD develop their significance thresholds for GHG emissions, the project proponent is encouraged to implement Mitigation Measure CC-MM-1 to reduce GHG emissions.

Table 3.6-4. Greenhouse Gas Emissions during Construction

	GHG Constituent Metric Tons			GHG CO_2e Metric Tons			
Emission Category	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2e
Alternative 1							
Year 1 (2013)	2,786	0.16	0.07	2,786	3	22	2,812
Year 2 (2014)	10,092	0.57	0.26	10,092	12	80	10,184
Year 3 (2015)	6,822	0.39	0.17	6,822	8	54	6,884
Total	19,701	1.12	0.50	19,701	24	156	19,880
Levee Project Lifetime (years)							50
Annualized GHG Emissions (tons CO_2e per year)							398
Alternative 2							
Year 1 (2013)	4,780	0.27	0.12	4,780	6	38	4,823
Year 2 (2014)	16,346	0.93	0.42	16,346	20	129	16,495
Year 3 (2015)	10,657	0.61	0.27	10,657	13	84	10,754
Total	31,783	1.81	0.81	31,783	38	251	32,072
Levee Project Lifetime (years)							50
Annualized GHG Emissions (tons CO_2e per year)							641
Alternative 3							
Year 1 (2013)	2,091	0.12	0.05	2,091	2	17	2,110
Year 2 (2014)	9,033	0.51	0.23	9,033	11	71	9,116
Year 3 (2015)	6,368	0.36	0.16	6,368	8	50	6,426
Total	17,493	0.99	0.45	17,493	21	138	17,652
Levee Project Lifetime (years)							50
Annualized GHG Emissions (tons CO_2e per year)							353

Note: Values may not add due to rounding.
GHG = greenhouse gas.
CO_2e = carbon dioxide equivalent.
CO_2 = carbon dioxide.
CH_4 = methane.
N_2O = nitrous oxide.

Mitigation Measure CC-MM-1: Implement Measures to Minimize GHG Emissions during Construction

The following measures should be considered to lower GHG emissions during construction. These mitigation measures combine the most stringent aspects of the currently proposed mitigation measures published by Bay Area Air Quality Management District (2010) and other air quality districts in California.

- Comply with all applicable future GHG regulations at the time of project-level permitting and construction.
- Use biodiesel fuel to fuel a substantial portion of the diesel-powered equipment and vehicles (e.g., 15% of the vehicles, as proposed by the Bay Area Air Quality Management District). However, it is important to note that according to a recent EPA report (U.S. Environmental

Protection Agency 2009), some renewable fuels (e.g., ethanol, recycled vegetable oil biodiesel) could result in less GHG emissions than petroleum fuels, while some renewable fuels (e.g., soy-based biodiesel) might increase GHG emissions. Therefore, the construction contractors should be cautious with the use of appropriate biodiesel fuels and should avoid using soy-based biodiesel as an attempt to reduce GHG emissions.

- Encourage construction workers to carpool.
- Recycle at least 50% of construction waste and demolition debris.
- Purchase at least 10% of the building materials and imported soil from sources within 100 miles of the project site.
- Use electricity from utility power lines rather than fossil fuel, where appropriate.
- Purchase GHG offset for project GHG emissions (direct emissions plus indirect emissions from on-road haul trucks plus commute vehicles) exceeding future Federal, state, or local significance thresholds applicable at the time of construction. If no GHG significance thresholds have been formally adopted at the time of permitting, a presumptive GHG threshold of 7,000 MT per year of CO_2e (amortized over the 50-year life of the levee project) should be used to define the offset requirement. The 7,000 MT/year presumptive threshold matches the lowest industrial project threshold that has been proposed by any air quality agency in California as of the date of this study. All purchased offsets must be verifiable under protocols set by the California Climate Action Registry, the Chicago Climate Exchange, or comparable auditing programs.

Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs

The FRWLP does not pose any apparent conflict with the goals of AB 32, the key elements and GHG reduction measures in the Climate Change Scoping Plan, or any other plans for reduction or mitigation of GHGs. To date, no Federal, state, or local agency with jurisdiction over the proposed project has adopted plans or regulations that set specific goals for emission limits or emission reductions applicable to the proposed levee improvement project. As described in Effect CC-1, the average forecast emissions from the implementation of the proposed project were compared to conservatively low presumptive significance thresholds that were derived from the draft GHG guidelines published by several local air quality agencies. The forecast emission rates are well below the presumptive significance threshold. Therefore, the proposed project would not conflict with or obstruct the implementation of GHG emission reduction plans. This effect would be less than significant. No mitigation is required.

Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change

Global climate change could affect the hydrology of the Feather River, including the frequency and the intensity of future flood events. Future water levels are not expected to increase substantially as a result of climate change, but the timing and intensity of flood events might change in the future. Section 3.1, ~~*Flood Control*~~*Flood risk management* *and Geomorphology*, notes that the project area is located over 50 feet above sea-level and suggests that the Feather River levee system is relatively insensitive to the projected changes in sea level rise which are projected to be no more than 1.3 meters (4.3 feet) by 2,100 meters (David Ford Consulting Engineers, Sutter Basin Design Rainfall

Memo, dated ~~18~~ June 14, 2011; Cayan, et.al. 2012: 23). Furthermore, the seepage control features developed for the FRWLP are designed to accommodate future flood intensities. Therefore, this effect would be less than significant. No mitigation is required.

3.6.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on climate change and GHGs. These potential effects and related mitigation measure requirements are summarized in Table 3.6-5 and discussed below.

Table 3.6-5. Climate Change Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold	Less than significant	CC-MM-1: Implement Measures to Minimize GHG Emissions during Construction	Less than significant
Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs	Less than significant	None required	Less than significant
Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change	Less than significant	None required	Less than significant

GHG = greenhouse gas.

Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold

Neither FRAQMD nor BCAQMD formally adopted GHG thresholds for projects such as the FRWLP. Therefore, a presumptive threshold of 7,000 MT per year (the lowest threshold of any formally adopted GHG threshold) is compared against the CO_2 emissions for the FRWLP. As noted in Table 3.6-4, the CO_2 emissions project-wide without mitigation would be only 641 tons per year, annualized over the 50-year levee lifespan. Within FRAQMD and BCAQMD, respectively, CO_2 emissions without mitigation would be 551 tons per year and 90 tons per year. These emissions are well below the presumptive threshold, so the effects of GHG emissions during construction are considered less than significant. However, before BCAQMD and FRAQMD develop their significance thresholds for GHG emissions, the project proponent is encouraged to implement Mitigation Measure CC-MM-1 to reduce GHG emissions.

Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs

The FRWLP does not pose any apparent conflict with the goals of AB 32, the key elements and GHG reduction measures in the Climate Change Scoping Plan, or any other plans for reduction or mitigation of GHGs. To date, no Federal, state, or local agency with jurisdiction over the proposed project has adopted plans or regulations that set specific goals for emission limits or emission reductions applicable to the proposed levee improvement project. As described in Effect CC-1, the average forecast emissions from the implementation of the proposed project were compared to conservatively low presumptive significance thresholds that were derived from the draft GHG guidelines published by several local air quality agencies. The forecast emission rates are well below the presumptive significance threshold. Therefore, the proposed project would not conflict with or

obstruct the implementation of GHG emission reduction plans. This effect would be less than significant. No mitigation is required.

Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

3.6.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on climate change and GHGs. These potential effects and related mitigation measure requirements are summarized in Table 3.6-6 and discussed below.

Table 3.6-6. Climate Change Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold	Less than significant	CC-MM-1: Implement Measures to Minimize GHG Emissions during Construction	Less than significant
Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs	Less than significant	None required	Less than significant
Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change	Less than significant	None required	Less than significant

GHG = greenhouse gas.

Effect CC-1: Increase in GHG Emissions during Construction Exceeding Threshold

Neither FRAQMD nor BCAQMD formally adopted GHG thresholds for projects such as the FRWLP. Therefore, a presumptive threshold of 7,000 MT per year (the lowest threshold of any formally adopted GHG threshold) is compared against the CO_2 emissions for the FRWLP. As noted in Table 3.6-4, the CO_2 emissions project-wide without mitigation would be only 353 tons per year, annualized over the 50-year levee lifespan. Within FRAQMD and BCAQMD, respectively, CO_2 emissions without mitigation would be 284 tons per year and 69 tons per year. These emissions are well below the presumptive threshold, so the effects of GHG emissions during construction are considered less than significant. However, before BCAQMD and FRAQMD develop their significance thresholds for GHG emissions, the project proponent is encouraged to implement Mitigation Measure CC-MM-1 to reduce GHG emissions.

Effect CC-2: Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs

The FRWLP does not pose any apparent conflict with the goals of AB 32, the key elements and GHG reduction measures in the Climate Change Scoping Plan, or any other plans for reduction or mitigation of GHGs. To date, no Federal, state, or local agency with jurisdiction over the proposed project has adopted plans or regulations that set specific goals for emission limits or emission

reductions applicable to the proposed levee improvement project. As described in Effect CC-1, the average forecast emissions from the implementation of the proposed project were compared to conservatively low presumptive significance thresholds that were derived from the draft GHG guidelines published by several local air quality agencies. The forecast emission rates are well below the presumptive significance threshold. Therefore, the proposed project would not conflict with or obstruct the implementation of GHG emission reduction plans. This effect would be less than significant. No mitigation is required.

Effect CC-3: Failure to Address Changes in Flood Frequency and Floodwater Elevation Caused by Global Climate Change

The effect is the same as described under Alternative 1. This effect would be less than significant. No mitigation is required.

3.7 Noise

3.7.1 Introduction

This section describes the regulatory and environmental setting for noise; noise effects that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.7.1.1 Noise Fundamentals

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes a negative psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, evaluation of noise is necessary when considering the environmental effects of a proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water, and *noise* is generally defined as unwanted sound that annoys or disturbs people. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient (existing) sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called *A-weighting*, written as *dBA* and referred to as *A-weighted decibels*. Table 3.7-1 provides definitions of sound measurements and other terminology used in this section, and Table 3.7-2 summarizes typical A-weighted sound levels for different noise sources.

In general, human sound perception is such that a change in sound level of 1 dB typically cannot be perceived by the human ear, a change of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (such as L_{10}, L_{20}), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). L_{dn} and CNEL values differ by less than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

For a point source such as a stationary compressor or construction equipment, sound attenuates based on geometry at rate of 6 dB per doubling of distance. For a line source such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance (California Department of Transportation 2009). Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travels over a hard surface such as

pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers such as buildings and topography that block the line of sight between a source and receiver also increase the attenuation of sound over distance.

Table 3.7-1. Definition of Sound Measurements

Sound Measurements	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-weighted decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Maximum sound level (L_{max})	The maximum sound level measured during the measurement period.
Minimum sound level (L_{min})	The minimum sound level measured during the measurement period.
Equivalent sound level (L_{eq})	The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-exceeded sound level (L_{xx})	The sound level exceeded "x" percent of a specific time period. L_{10} is the sound level exceeded 10% of the time.
Day-night level (L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community noise equivalent level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Peak particle velocity (peak velocity or PPV)	A measurement of ground vibration defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches per second.
Frequency: hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.

Table 3.7-2. Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: California Department of Transportation 2009.

3.7.1.2 Vibration Fundamentals

Operation of heavy construction equipment, particularly pile-driving and other impact devices such as pavement breakers, create seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance.

Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration 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).

Table 3.7-3 summarizes typical vibration levels generated by construction equipment (Federal Transit Administration 2006).

Table 3.7-3. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet
Pile driver (impact)	0.644–1.518
Pile drive (sonic/vibratory)	0.170–0.734
Vibratory roller	0.210
Hoe ram	0.089
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Source: Federal Transit Administration 2006.	

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation can be used to estimate the vibration level at a given distance for typical soil conditions (Federal Transit Administration 2006). PPV_{ref} is the reference PPV from Table 3.7-3:

$$PPV = PPV_{ref} \times (25/Distance)^{1.5}$$

Tables 3.7-4 and 3.7-5 summarize the typical human response to transient vibration and continuous vibration that are usually associated with construction activity. Equipment or activities typical of continuous vibration include excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include impact pile drivers, blasting, drop balls, "pogo stick" compactors, and crack-and-seat equipment (California Department of Transportation 2004).

Table 3.7-4. Human Response to Transient Vibration

PPV	Human Response
2.0	Severe
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible
Source: California Department of Transportation 2004.	

Table 3.7-5. Human Response to Continuous Vibration

PPV	Human Response
3.6 (at 2 Hz) to 0.4 (at 20 Hz)	Very disturbing
0.7 (at 2 Hz) to 0.17 (at 20 Hz	Disturbing
0.10	Strongly perceptible
0.035	Distinctly perceptible
0.012	Slightly perceptible
Source: California Department of Transportation 2004.	

The decibel scale can also be used to describe vibration velocity. Root-mean-squared (rms) velocity rather than peak velocity is used in the following equation to express vibration in terms of decibels (Federal Transit Administration 2006):

$Lv = 20 \times \log_{10}(v/v_{ref})$

Where:

L_v = vibration velocity level in decibels

v = the rms velocity amplitude of interest

v_{ref} = the reference velocity amplitude (1×10^{-6} inches/second in the U.S.)

3.7.2 Affected Environment

This section describes the affected environment for noise in the project area. The key sources of data and information used in the preparation of this section are listed below.

- Sutter County General Plan, Public Draft, Noise Element (Sutter County 2010a).
- Sutter County General Plan Draft Environmental Impact Report (Sutter County 2010b).
- Butte County General Plan 2030, Health and Safety Element (Butte County 2010a).
- Butte County General Plan 2030 Draft Environmental Impact Report (Butte County 2010b).

3.7.2.1 Regulatory Setting

This section summarizes key Federal, state, and local regulatory information that applies to noise. Federal

Noise from sources associated with the proposed project are regulated at the local level. There are no applicable Federal regulations.

State

Noise from sources associated with the proposed project are regulated at the local level. There are no applicable state regulations.

Local

Sutter County

Municipal Code or Ordinance

Sutter County does not have a noise ordinance.

General Plan Noise Element

The Noise Element of the Sutter County General Plan establishes noise goals, policies and implementation programs (Sutter County 2010a). The following noise policies relate to the proposed project.

- **N 1.4 New Stationary Noise Sources.** Require new stationary noise sources to mitigate noise impacts on noise-sensitive uses wherever the noise from that source alone exceeds the exterior levels specified in Table 11-3 [shown below as Table 3.7-6].
- **N 1.6 Construction Noise.** Require discretionary projects to limit noise-generating construction activities within 1,000 feet of noise-sensitive uses (i.e., residential uses, daycares, schools, convalescent homes, and medical care facilities) to daytime hours between 7:00 A.M. and 6:00 P.M. on weekdays, 8:00 A.M. and 5:00 P.M. on Saturdays, and prohibit construction on Sundays and holidays unless permission for the latter has been applied for and granted by the County.
- **N 1.7 Vibration Standards.** Require construction projects and new development anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby noise-sensitive uses based on Federal Transit Administration criteria (Federal Transit Administration 2006).

Table 3.7-6. Sutter County Noise Level Standards from Stationary Sources

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	55	45
Maximum level, dB	70	65

Butte County

Municipal Code or Ordinance

The Butte County Code of Ordinances, Chapter 24—Zoning, Section 24-150 states the following.

> Noise generated by the commercial use shall be restricted to 60 dB at the common property line for a period of 6 hours per day with no noise exceeding 80 dB.

General Plan Health and Safety Element

The Butte County General Plan 2030 contains the following noise policies that relate to the proposed project.

- **Policy HS-P1.7:** Applicants for discretionary permits shall be required to limit noise-generating construction activities located within 1,000 feet of residential uses to daytime hours between 7:00 a.m. and 6:00 p.m. on weekdays and non-holidays.
- **Policy HS-P1.8:** Noise from generators shall be regulated near existing and future residential uses.

City of Yuba City

Municipal Code or Ordinance

Title 4, *Public Safety,* of the Yuba City Municipal Code prohibits the operation of noise-generating construction equipment before 6:00 a.m. or after 9:00 p.m. daily except Sunday and State or Federal holidays when the prohibited time is before 8:00 a.m. and after 9:00 p.m.

General Plan Noise and Safety Element

The City of Yuba City General Plan contains policies related to noise in its Noise and Safety Element (City of Yuba City 2004), including the following.

- **Policy 9.1-G-1:** Strive to achieve an acceptable noise environment for the present and future residents of Yuba City.

City of Live Oak

Municipal Code or Ordinance

The City of Live Oak does not have a code or ordinance that relates to noise.

General Plan Noise Element

The City of Live Oak 2030 General Plan outlines goals, policies, and implementation programs related to noise (City of Live Oak 2010). Table 3.7-7 summarizes the maximum allowable noise exposure from non-transportation sources specified in the general plan.

Table 3.7-7. City of Live Oak Maximum Allowable Noise Exposure from Non-Transportation Noise Sources at Noise-Sensitive Land Uses

Noise Level Descriptor	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Hourly L_{eq}	60 dBA	45 dBA
L_{max}	75 dBA	65 dBA
Source: City of Live Oak 2010.		

City of Biggs

Municipal Code or Ordinance

Title 7, Public Peace, Morals and Welfare, of the City of Biggs Municipal Code includes noise ordinances. The code prohibits loading and unloading activities between the hours of 10:00 p.m. and 6:00 a.m. in such manner that creates noise clearly audible across a residential zoned or a commercial zoned real property boundary. The code also prohibits the operation of noise-generating construction equipment between the hours of 7:00 p.m. and 6:00 a.m. on weekdays or at any time on Sundays or holidays in such a manner that creates noise clearly audible across a residential zoned or a commercial zoned real property boundary, except for emergency work being performed by a public agency or a public utility.

General Plan Noise Element

Noise-related goals, programs, and policies are outlined in the Noise Element of the City of Biggs General Plan 1997–2015 (City of Biggs 1998). Table 3.7-8 provides the City's noise level performance standards for non-transportation sources.

Table 3.7-8. City of Biggs Noise Level Performance Standards Non-Transportation Sources

Noise Level Descriptor	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
Hourly L_{eq}, dB	55	45
Maximum dB	75	65

Source: City of Biggs 1998.

Notes:

Noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

Transportation noise sources are defined as traffic on public roadways, railroad line operations, and aircraft in flight.

City of Gridley

Municipal Code or Ordinance

Title 9 (Public Peace, Morals, and Welfare) of the City of Gridley Municipal Code includes noise ordinances. The code prohibits loading and unloading activities between the hours of 10:00 p.m. and 6:00 a.m. in such manner that creates noise clearly audible across a residential zoned or a commercial zoned real property boundary. The code also prohibits the operation of noise-generating construction equipment between the hours of 7:00 p.m. and 6:00 a.m. on weekdays or at any time on Sundays or holidays in such a manner that creates noise clearly audible across a residential zoned or a commercial zoned real property boundary, except for emergency work being performed by a public agency or a public utility.

General Plan Noise Element

Noise-related goals, policies, and implementation strategies are outlined in the Noise Element of the City of Gridley 2030 General Plan (City of Gridley 2010). Table 3.7-9 provides noise level performance standards for non-transportation sources identified in the general plan.

Table 3.7-9. City of Gridley Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Noise Sources

Noise Level Descriptor	Daytime (dB) (7 a.m.–10 p.m.)	Nighttime (dB) (10 p.m.–7 a.m.)
Hourly average level (L_{eq})	60	45
Maximum equivalent levels (L_{max})	75	65

Source: City of Gridley 2010.

Notes: Each of the noise levels specified shall be lowered by 5 decibels for simple tone noises, noises consisting primarily of speech, or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The noise standard is to be applied at the property lines of the generating land use.

3.7.2.2 Environmental Setting

The following discussion identifies noise-sensitive land uses in the affected area and describes the existing noise environment in the affected area.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could negatively affect the primary intended use of the land. Noise-sensitive uses typically include residences, schools, healthcare facilities, community centers, and places of worship. Recreational areas such as parks and trails are also areas where noise can negatively affect the purpose of the area.

Noise-sensitive uses within about 2 miles of the project area are located primarily in the main areas of development, which include the cities of Yuba City, Marysville, Live Oak, Gridley, and Biggs. Rural residences and recreational uses are scattered throughout other parts of the affected area. Table 3.7-10 summarizes developed land uses by contract area and reach.

Table 3.7-10. Noise-Sensitive Uses by Construction Contract Areas and FRWLP Reaches

Construction Contract	FRWLP Reaches	Noise-Sensitive Uses
A	2–5	Scattered rural residences Lake of the Woods State Wildlife Area
B	6–12	Scattered rural residences Residences in south end of Yuba City (Reach 11)
C	13–25	Scattered rural residences Residences in Yuba City and Marysville (Reaches 11–18) Residences in Live Oak (Reaches 22–24)
D	26–41	Scattered rural residences Residences in Gridley (Reaches 30–31) Residences in Biggs (Reaches 34–36)

Existing Noise Environment

There are several primary sources of noise in the affected area. Mobile noise sources are those related to transportation and include roadway traffic, railroads, and airports. By far the most prevalent noise source is roadway traffic, which is a constant source of noise compared to the intermittent sounds generated by railroads and airports. Stationary sources of noise in the area include aggregate mines, natural gas extraction facilities, recycling facilities, solid waste transfer stations, agricultural activities, general service commercial and light industrial uses, recreational uses, and parks and school playing fields.

Ambient noise measurements conducted in the affected area indicate that daytime ambient noise levels are in the range of 41 to 76 dBA-L_{eq}, with the lowest noise levels being in undeveloped rural areas and the highest noise levels being near SR 99 (Sutter County 2010b).

The existing noise environment in the affected area can be characterized generally by the area's level of development. The level of development and ambient noise levels tend to be closely correlated. Areas that are not urbanized are relatively quiet, while areas more urbanized are noisier as a result of roadway traffic, industry, and other human activities. Table 3.7-11 summarizes typical ambient noise levels based on level of development. These levels are consistent with the measured levels discussed above.

Table 3.7-11. Population Density and Associated Ambient Noise Levels

	L_{dn}
Rural	40–50
Small town or quiet suburban residential	50
Normal suburban residential	55
Urban residential	60
Noisy urban residential	65
Very noisy urban residential	70
Downtown, major metropolis	75–80
Area adjoining freeway or near major airport	80–90
Source: Hoover and Keith 2000.	

Table 3.7-12 summarizes daily traffic volumes along highways in the affected area along with estimated traffic noise levels at 100 feet from the roadway centerline. Traffic volumes are from Sutter County (2010b) and Butte County (2010b). Traffic noise levels were calculated using these volumes and the Federal Highway Administration Traffic Noise Model Version 2.5.

Table 3.7-12. Traffic Volumes and Noise Levels on Highways in the Project Area

County—Roadway		Existing Average Daily Traffic Volume	Existing Traffic Noise Level (L_{dn})[a]
From	To		
Sutter County—SR 20			
Colusa County Line	Sutter Bypass	7,200	62
Sutter Bypass	Acacia Avenue	7,200	62
Acacia Avenue	Humphrey Road	9,500	63
Humphrey Road	Township Road	9,500	63
Township Road	George Washington Blvd	12,200	64
George Washington Blvd	Yuba City Limits	17,500	66
Sutter County—SR 113			
Yolo County Line	Knights Road	7,400	62
Knights Road	Del Monte Avenue	7,400	62
Del Monte Avenue	Sutter Bypass	5,500	61
Sutter Bypass	George Washington Blvd	5,800	61
George Washington Blvd	Junction Route 99	3,850	59
Sutter County—SR 99			
Garden Highway	Sacramento Avenue	17,400	66
Sacramento Avenue	Tudor Road	17,600	66
Tudor Road	Junction Route 113	14,400	65
Junction Route 113	O'Banion Road	17,300	65
O'Banion Road	Oswald Road	17,300	65
Oswald Road	Barry Road	19,600	66
Barry Road	Bogue Road	21,100	66
Bogue Road	Lincoln Road	26,500	67
Lincoln Road	Franklin Road	26,500	67
Franklin Road	Bridge Street	36,000	69

County—Roadway		Existing Average Daily Traffic Volume	Existing Traffic Noise Level (L_{dn})[a]
From	To		
Bridge Street	Junction Route 20	21,800	66
Junction Route 20	Queens Avenue	20,300	66
Queens Avenue	Pease Avenue	20,300	66
Pease Avenue	Eager Road	20,300	66
Eager Road	End Freeway	17,800	66
End Freeway	Encinal Road	17,800	66
Encinal Road	Live Oak Boulevard	19,900	66
Live Oak Blvd	Paseo Avenue	15,600	65
Paseo Avenue	Live Oak city limits	15,600	65
Live Oak city limits	Pennington Road	15,600	65
Pennington Road	Live Oak city limits	15,600	65
Live Oak city limits	Sutter–Butte county line	15,600	65
Butte County—SR 99			
Sutter–Butte county line	Archer Avenue	18,000	66
Archer Avenue	Spruce Street (Gridley)	23,500	67
Spruce Street	East Biggs Highway	16,500	65

Source: Sutter County 2010b; Butte County 2010b.
[a] At 100 feet from roadway centerline.

The Union Pacific Railroad track called the Valley Line runs parallel to SR 99. The 70 L_{dn} contour is located about 160 feet from the centerline of the track, the 65 dB-L_{dn} contour is about 340 feet from the centerline of the track, and the 60 dB-L_{dn} contour is 740 feet from the centerline of the track (Butte County 2010b).

One airport, the Sutter County Airport, exists in the affected area. This airport is located along the southeast side of Yuba City. The airport is used primarily for agricultural aerial-spraying purposes and private use. Other uses include flight instruction, aircraft rentals, and aircraft sales. There are approximately 110 flights a day at this airport.

Three small airstrips exist in the area.

- Jones Ag-viation, about 0.5 mile west of Thermalito Afterbay.
- Bowles airstrip, about 2 miles northwest of Live Oak.
- Vanderford Ranch Company airstrip, about 4 miles southwest of Yuba City.

3.7.3 Environmental Consequences

This section describes the environmental consequences relating to noise for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.7.3.1 Assessment Methods

This analysis focuses on the potential construction-related noise effects associated with implementation of the FRWLP. There are no new operational activities associated with the proposed project that would generate noise. Current levels of maintenance activities would be maintained. Construction equipment and operational data provided by the project engineers (HDR/Wood Rodgers 2012) and methods recommended by the Federal Highway Administration (2006) have been used to assess construction noise. Temporary groundborne vibration from construction activity has also been assessed using methods recommended by the Federal Transit Administration (2006).

Construction activities under each alternative would occur in four construction contract areas. Table 3.7-13 identifies the construction contract areas by reach.

Table 3.7-13. Construction Contract Areas and FRWLP Reaches

Construction Contract	FRWLP Reaches
A	2–5
B	6–12
C	13–25
D	26–41

Project engineers have developed a list of construction equipment to be used under each phase of construction for each construction contract area and each project alternative (HDR/Wood Rodgers 2012). Similar information has been developed for the two alternatives associated with cutoff wall gap closures and special crossings.

Table 3.7-14 summarizes the equipment expected to be used and typical noise emission levels from Federal Highway Administration (2006). L_{max} and utilization percentage values are shown. L_{eq} values calculated from the L_{max} and utilization percentage values are also shown.

Table 3.7-14. Summary of Noise Emission Assumptions for Construction Equipment

Equipment Listed for Project	Comparable Equipment from FHWA 2006	Acoustical Use Factor (%)	L_{max} at 50 Feet (dBA)	L_{eq} at 50 Feet (dBA)
Elevating scrapers	Scraper	40	84	80
Water trucks	Dump truck	40	76	72
Front-end loaders	Front end loader	40	79	75
Haul trucks	Dump truck	40	76	72
Pickup trucks	Pickup truck	40	75	71
Tractors with discing equipment	Tractor	40	84	80
Excavators	Excavator	40	81	77
Scrapers	Scraper	40	84	80
Vibratory rollers	Roller	20	80	73
Hydraulic excavators	Excavator	40	81	77
Deep soil-mixing auger	Auger drill rig	20	84	77
Extended boom pallet loader	Front end loader	40	79	75
300 kW generators	Generator	50	81	78
Slurry pumps	Pumps	50	81	78
Motor graders	Grader	40	85	81
Backhoes	Backhoe	40	78	74
Rubber tire crane	Crane	16	81	73
Hydroseeding trucks	Dump truck	40	76	72
Paving machine	Paver	50	77	74
Soil mix drill rig	TRD machine	50	80	77
Sand blasting (single nozzle)	Jet grouting machine	20	96	89
Water truck	Dump truck	40	76	72

FHWA = Federal Highway Administration; TRD = Trench Remixing, Deep Method.

Construction noise levels associated with each alternative have been developed based on the source levels in Table 3.7-14 and construction data provided by the project engineers (HDR/Wood Rodgers 2012). To develop a reasonable worst-case assessment of construction noise, all equipment identified within each construction sub-phase is assumed to operate concurrently. Accordingly, sound levels for all equipment within each sub-phase have been added to provide a cumulative construction noise level for each sub-phase.

Based on cumulative noise levels for each sub-phase, the distances within which construction noise from each sub-phase is predicted to exceed daytime and nighttime significance thresholds have also been developed. This calculation is based on point source attenuation of 6 dB per doubling of distance, assuming no shielding between the source and the receiver. In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee), sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

The construction in each contract area is anticipated to occur in single 10-hour shifts, 6 days a week. An exception to this schedule is cutoff wall construction, which is anticipated to occur in two 10-hour shifts (essentially 24-hour construction), 6 days per week. While production work would

not occur between the two 10-hour shifts, equipment maintenance and preparations for the upcoming work shift would occur. Maintenance work is also anticipated on Sundays.

3.7.3.2 Determination of Effects

For this analysis, an effect pertaining to noise and vibration was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

A noise effect is normally considered significant if it would result in one or more of the following.

- Expose persons to or generate noise levels in excess of applicable standards.
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- Expose persons to vibration or generation of excessive groundborne noise levels.

There are no specific local noise standards for construction noise. There are however noise standards for permanent non-transportation sources that range between 50 dBA-L_{eq} and 60 dBA-L_{eq} for the hours between 7:00 a.m. and 10:00 p.m. and 45 dBA-L_{eq} for the hours between 10:00 p.m. and 7:00 a.m. Because construction noise is temporary the higher daytime standard is used.

For the purposes of this analysis, a noise or vibration effect is considered to be significant if it would result in one or more of the following.

- Construction noise levels are predicted to exceed 60 dBA-L_{eq} at noise-sensitive uses between the hours of 7:00 a.m. and 10:00 p.m. or 45 dBA-L_{eq} between the hours of 10:00 p.m. and 7:00 a.m.
- Trucks traveling on public roads or on onsite haul routes would result in noise exceeding 60 L_{dn} at residences.
- Construction vibration is predicted to exceed a PPV of 0.2 inches per second (in/sec) at any structure or occupied building based on Caltrans guidance for potential damage to older buildings and annoyance.

3.7.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning noise are summarized in Table 3.7-15.

Table 3.7-15. Summary of Effects for Noise

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise	Significant	NOI-MM-1: Employ Noise-Reducing Construction Practices	Significant and unavoidable
NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration	Significant	NOI-MM-2: Employ Vibration-Reducing Construction Practices	Significant and unavoidable

3.7.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, and no levee improvements would be made to increase the level of protection. No construction-related effects relating to noise would occur. Accordingly, there would be no noise effects attributable to the implementation of the No Action Alternative.

Because no levee improvements would be made under the No Action Alternative, the risk that the levee could fail due to seepage or slope stability or geometry issues would continue. Failure of the levee, depending on the magnitude of the event, could cause catastrophic flooding. Without improvements to the levee system, the risk of levee failure would remain high. Under these conditions, any of the levee deficiencies could cause portions of the levees to fail, triggering widespread flooding and extensive damage. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. Timing and duration of use would directly correlate with flood fighting needs, but could last for days, weeks, even months. Depending on the magnitude of the flood, people may or may not be present during flood fighting activities. If flooding occurred only west of the Feather River, nearby Marysville residents could still be residing and working near a clean-up area, exposing them to excessive noise and vibration levels for extended periods of time.

Furthermore, because of the unpredictable nature of an emergency response, compliance with local noise ordinances and implementation of BMPs to manage noise levels would not be possible. All of these effects could be considered significant. However, the timing, duration and magnitude of a flood event are speculative and unpredictable, and thus a precise determination of significance is not possible.

3.7.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on noise. These potential effects and related mitigation measure requirements are summarized in Table 3.7-16 and discussed below.

Table 3.7-16. Noise Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise	Significant	NOI-MM-1: Employ Noise-Reducing Construction Practices	Significant and unavoidable
NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration	Significant	NOI-MM-2: Employ Vibration-Reducing Construction Practices	Significant and unavoidable

Effect NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise

Alternative 1—Construction Contract A

Table 3.7-17 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 1 Construction Contract A. This indicates that scattered rural residences could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-17. Summary of Predicted Construction Noise Levels under Alternative 1 Construction Contract A

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	90	1,626	9,145
2. Borrow site preparation	86	1,022	5,747
3. Levee degrading/work surface construction	93	2,189	12,312
4. Cutoff wall construction	89	1,418	7,975
5. Levee reconstruction/seepage berm construction	94	2,455	13,804
6. Borrow site excavation	90	1,575	8,857
7. Utility reconstruction	84	749	4,209
8. Levee resurfacing	88	1,218	6,851
9. Hydroseeding	80	489	2,747
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee), sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 1—Construction Contract B

Table 3.7-18 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 1 Construction Contract B. This indicates that scattered rural residences and residences located in the south end of Yuba City could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-18. Summary of Predicted Construction Noise Levels under Alternative 1 Construction Contract B

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	90	1,602	9,006
2. Borrow site preparation	86	1,022	5,747
3. Levee degrading/work surface construction	93	2,189	12,312
4. Cutoff wall construction	90	1,515	8,518
5. Levee reconstruction	94	2,455	13,804
6. Borrow site excavation	90	1,524	8,569
7. Utility reconstruction	84	749	4,209
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	75	282	1,587
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee), sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 1—Construction Contract C

Table 3.7-19 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 1 Construction Contract C. This indicates that scattered rural residences and residences located in Yuba City, Marysville, and Live Oak could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-19. Summary of Predicted Construction Noise Levels under Alternative 1 Construction Contract C

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	87	1,170	6,581
2. Borrow site preparation	86	1,022	5,747
3. Levee degrading/work surface construction	93	2,141	12,038
4. Cutoff wall construction	92	1,902	10,696
5. Levee reconstruction/seepage berm construction	93	2,184	12,281
6. Borrow site excavation	91	1,796	10,098
7. Utility reconstruction	80	518	2,915
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	78	378	2,126
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee), sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 1—Construction Contract D

Table 3.7-20 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 1 Construction Contract D. This indicates that scattered rural residences and residences located in Gridley and Biggs could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-20. Summary of Predicted Construction Noise Levels under Alternative 1 Construction Contract D

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	86	996	5,601
2. Borrow site preparation	89	1,445	8,128
3. Levee degrading/work surface construction	93	2,131	11,985
4. Cutoff wall construction	91	1,715	9,643
5. Levee reconstruction	94	2,391	13,447
6. Borrow site excavation	91	1,829	10,283
7. Utility reconstruction	80	518	2,915
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	78	378	2,126
10. Demobilization/cleanup	78	399	2,243

Onsite Haul Truck Activity

Specific borrow site locations and onsite haul routes have not been defined. However, project engineers have stated that there would be up to 15 truck trips per day to each borrow site (Jabbour pers. comm.). This corresponds to 30 truck passes per day. Assuming these trips occur over a 10-hour work day (three passes per hour) at 25 miles per hour, the corresponding noise level at 50 feet is 45 L_{dn}. Because this value is less than 60 L_{dn} the noise effect of haul trucks accessing borrow sites is considered to be less than significant.

Offsite Haul Truck Activity on Public Roads

Specific information on the daily volume of trucks that would travel on public roads has not been determined. However, it would take 50 truck passes per hour at 45 mph over a 10-hour work day (i.e., 500 passes or 250 total daily trips) on any given road to produce a sound level of 60 L_{dn} at 50 feet. Because it is not anticipated that this many trips will need to occur on any given public road, the noise effect of project trips on public roads is considered to be less than significant.

Alternative 1—Effect NOI-1 Conclusion

The results of the construction noise analysis above indicate that noise-sensitive uses could be exposed to construction noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours. The potential exposure of noise-sensitive receptors to construction noise is considered to be significant.

Noise from haul trucks on the designated onsite haul routes from borrow sites and on public roads is not expected to exceed 60 L_{dn} at adjacent residences and is therefore considered to be less than significant.

Mitigation Measure NOI-MM-1: Employ Noise-Reducing Construction Practices

To the extent feasible construction contractors shall control noise from construction activity such that noise does not exceed applicable noise standards specified by the Cities of Yuba City, Marysville, Live Oak, and Biggs; Sutter County; and Butte County. Where there is not a specific noise standard noise will be limited to 60 dBA-L_{eq} at noise-sensitive uses between the hours of 7:00 a.m. and 10:00 p.m. or 45 dBA-L_{eq} between the hours of 10:00 p.m. and 7:00 a.m.

Measures that can be implemented to control noise include the following.

- Locate noise-generating equipment as far away as practical from residences and other noise-sensitive uses.
- Equip all construction equipment with standard noise attenuation devices such as mufflers to reduce noise and equip all internal combustion engines with intake and exhaust silencers in accordance with manufacturer's standard specifications.
- Establish equipment and material haul routes that avoid residential uses to the extent practical, limit hauling to the hours between 7:00 a.m. and 10:00 p.m., and specify maximum acceptable speeds for each route.
- Employ electrically powered equipment in place of equipment with internal combustion engines where practical, where electric equipment is readily available, and where this equipment accomplishes project work as effectively and efficiently as equipment powered with internal combustion engines.

- Restrict the use of audible warning devices such as bells, whistles, and horns to those situations that are required by law for safety purposes.
- Provide a noise-reducing enclosure around stationary noise-generating equipment.
- Provide temporary construction noise barriers between active construction sites that are in close proximity to residential and other noise-sensitive uses. Temporary barriers can be constructed or created with parked truck trailers, soil piles, or material stock piles.

The construction contractor shall develop a construction noise control plan which identifies specific feasible noise control measures that will be employed and the extent to which the measure will be able to control noise to specific noise ordinance limits. The plan will identify areas where it not considered feasible to comply with applicable noise limits. The noise controlled shall be submitted to and approved by SBFCA before any noise-generating activity begins.

Although implementation of this measure will reduce the effect, it is not anticipated that feasible measures will be available in all situations to reduce noise to below the applicable noise ordinance limits. This effect is therefore considered to be significant and unavoidable.

Effect NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration

Vibration from construction equipment is a primary concern when pile driving or another similar highly dynamic activity would occur. Vibratory rollers, large bulldozers, and loaded trucks can also be a source of perceptible ground vibration. Table 3.7-21 summarizes typical construction vibration levels for various ~~the~~ types of dynamic construction equipment. Pile drivers are shown for reference only and are not anticipated to be used for this project. Other equipment listed could be used. ~~that would likely be used on this project.~~ Using methods specified in Federal Transit Administration (2006), distances are indicated within which vibration is estimated to exceed 0.2 inch per second.

Alternative 1—Effect NOI-2 Conclusion

It is anticipated that construction equipment would not typically operate within approximately 30 feet of residences and structures. However, there may be situations where this is required and where ground vibration could exceed 0.2 inch per second at residences and other structures. This effect is therefore considered to be significant.

Table 3.7-21. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet	Distance within Which Vibration is Estimated to Exceed 0.2 Inch per Second
Pile driver (impact)	1.518	100 feet
Pile drive (sonic/vibratory)	0.734	60 feet
Vibratory roller	0.210	26 feet
Large bulldozer	0.089	15 feet
Loaded trucks	0.076	14 feet
Jackhammer	0.035	<10 feet
Small bulldozer	0.003	<10 feet

Source: Federal Transit Administration 2006.
ppv = peak particle velocity.

Mitigation Measure NOI-MM-2: Employ Vibration-Reducing Construction Practices

The construction contractor will, to the extent feasible, maintain a minimum distance of 150 feet between pile driving equipment and occupied or vibration-sensitive buildings or structures. To the extent feasible, a minimum distance of 50 feet will be maintained between other construction equipment and occupied or vibration-sensitive buildings or structures. For cases where this is not feasible, residents or property owners will be notified in writing prior to construction activity that construction may occur in close proximity to their buildings. SBFCA will inspect the potentially affected buildings prior to construction to inventory existing cracks in paint, plaster, concrete, and other building elements. SBFCA will retain a qualified acoustical consultant or engineering firm to conduct vibration monitoring at potentially affected buildings to measure the actual vibration levels during construction. Following completion of construction, SBFCA will conduct a second inspection to inventory changes in existing cracks and new cracks or damage, if any, that occurred as a result of construction-induced vibration. If new damage is found, then SBFCA will promptly arrange to have the damaged repaired or will reimburse the property owner for appropriate repairs.

In addition, if construction activity is required within 100 feet of residences or other vibration-sensitive buildings, a designated complaint coordinator will be responsible for handling and responding to any complaints received during such periods of construction. A reporting program will be required that documents complaints received, actions taken, and the effectiveness of these actions in resolving disputes.

Although implementation of this measure will reduce the effect, it is not anticipated that feasible measures will be available in all situations to reduce vibration to below the applicable levels. This effect is therefore considered to be significant and unavoidable.

3.7.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on noise. These potential effects and related mitigation measure requirements are summarized in Table 3.7-22 and discussed below.

Table 3.7-22. Noise Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise	Significant	NOI-MM-1: Employ Noise-Reducing Construction Practices	Significant and unavoidable
NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration	Significant	NOI-MM-2: Employ Vibration-Reducing Construction Practices	Significant and unavoidable

Effect NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise

Alternative 2—Construction Contract A

Table 3.7-23 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 2 Construction Contract A. This indicates that scattered rural residences could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-23. Summary of Predicted Construction Noise Levels under Alternative 2 Contract A

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	90	1,626	9,145
2. Borrow site preparation	90	1,626	9,145
3. Levee degrading/work surface construction	85	921	5,178
4. Cutoff wall construction	86	1,047	5,890
5. Levee reconstruction/seepage and stability	95	2,919	16,416
6. Borrow site excavation	92	2,089	11,748
7. Utility reconstruction	84	749	4,209
8. Levee resurfacing	83	697	3,919
9. Hydroseeding	75	282	1,587
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 2—Construction Contract B

Table 3.7-24 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 2 Construction Contract B. This indicates that scattered rural residences and residences located in the south end of Yuba City could be exposed to noise exceeding 60 dBA-Leq during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-24. Summary of Predicted Construction Noise Levels under Alternative 2 Construction Contract B

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	90	1,602	9,006
2. Borrow site preparation	89	1,445	8,128
3. Levee degrading/	86	1,003	5,643
4. Cutoff wall construction	88	1,227	6,901
5. Levee reconstruction/seepage and stability/berm construction	95	2,876	16,172
6. Borrow site excavation	92	2,028	11,404
7. Utility reconstruction	84	749	4,209
8. Roadway reconstruction	86	997	5,607
9. Levee resurfacing	85	873	4,909
10. Hydroseeding	75	282	1,587
11. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 2—Construction Contract C

Table 3.7-25 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 2 Contract Area C. This indicates that scattered rural residences and residences located in Yuba City, Marysville, and Live Oak could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-25. Summary of Predicted Construction Noise Levels under Alternative 2 Construction Contract C

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	93	2,124	11,944
2. Borrow site preparation	89	1,445	8,128
3. Levee degrading/work surface construction	93	2,141	12,038
4. Cutoff wall construction	89	1,367	7,687
5. Levee reconstruction/seepage and stability/berm construction	94	2,391	13,447
6. Borrow site excavation	91	1,861	10,464
7. Utility reconstruction	80	518	2,915
8. Levee resurfacing	88	1,274	7,167
9. Hydroseeding	78	378	2,126
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 2—Construction Contract D

Table 3.7-26 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 2 Construction Contract D. This indicates that scattered rural residences and residences located in Gridley and Biggs could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-26. Summary of Predicted Construction Noise Levels under Alternative 2 Construction Contract D

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	89	1,331	7,485
2. Borrow site preparation	89	1,445	8,128
3. Levee degrading/work surface construction	NA	NA	NA
4. Cutoff wall construction	NA	NA	NA
5. Levee reconstruction/seepage and stability/berm construction	92	2,004	11,270
6. Borrow site excavation	91	1,796	10,098
7. Utility reconstruction	80	518	2,915
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	78	378	2,126
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.
NA = not applicable.

Onsite Haul Truck Activity

Specific borrow site locations and onsite haul routes have not been defined. However, project engineers have stated that there would be up to 15 truck trips per day to each borrow site (Jabbour pers. comm.). This corresponds to 30 truck passes per day. Assuming these trips occur over a 10-hour work day (three passes per hour) at 25 miles per hour, the corresponding noise level at 50 feet is 45 L_{dn}. Because this value is less than 60 L_{dn}, the noise impact of haul trucks accessing borrow sites is considered to be less than significant.

Offsite Haul Truck Activity on Public Roads

Specific information on the daily volume of trucks that would travel on public roads has not been determined. However, it would take 50 truck passes per hour at 45 mph over a 10-hour work day (i.e., 500 passes or 250 total daily trips) on any given road to produce a sound level of 60 L_{dn} at 50 feet. Because it is not anticipated that this many trips will need to occur on any given public road, the noise impact of project trips on public roads is considered to be less than significant.

Alternative 2—Effect NOI-1 Conclusion

The results of the construction noise analysis above indicate that noise-sensitive uses could be exposed to construction noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours. The potential exposure of noise-sensitive receptors to construction noise is considered to be significant.

Noise from haul trucks on the designated onsite haul routes from borrow sites and on public roads is not expected to exceed 60 L_{dn} at adjacent residences and is therefore considered to be less than significant.

Mitigation Measure NOI-MM-1: Employ Noise-Reducing Construction Practices

A full description of NOI-MM-1 is presented above under the Alternative 1 discussion. Although implementation of this measure will reduce the effect, it is not anticipated that feasible measures will be available in all situations to reduce noise to below the applicable noise ordinance limits. This effect is therefore considered to be significant and unavoidable.

Effect NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration

Vibration from construction equipment is ~~would be~~ a primary concern when pile driving or another similar highly dynamic activity would occur. Vibratory rollers, large bulldozers, and loaded trucks can also be a source of perceptible ground vibration. ~~Highly dynamic equipment such as this would not be employed under Alternative 2.~~ Table 3.7-21 summarizes typical construction vibration levels for various ~~the~~ types of dynamic construction equipment ~~that would be used on this project~~. Pile drivers are shown for reference only and are not anticipated to be used for this project. Other equipment listed could be used. Using methods specified in Federal Transit Administration (2006), distances are indicated within which vibration is estimated to exceed 0.2 inch per second.

Alternative 2—Effect NOI-2 Conclusion

It is anticipated that construction equipment would not typically operate within approximately 30 feet for residences and structures. However, there may be situations where this is required and where ground vibration could exceed 0.2 inch per second at residences and other structures. This effect is therefore considered to be significant.

Mitigation Measure NOI-MM-2: Employ Vibration-Reducing Construction Practices

A full description of NOI-MM-2 is presented above under the Alternative 1 discussion. Although implementation of this measure will reduce the effect, it is not anticipated that feasible measures will be available in all situations to reduce vibration to below the applicable levels. This effect is therefore considered to be significant and unavoidable.

3.7.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on noise. These potential effects and related mitigation measure requirements are summarized in Table 3.7-27 and discussed below.

Table 3.7-27. Noise Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise	Significant	NOI-MM-1: Employ Noise-Reducing Construction Practices	Significant and unavoidable
NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration	Significant	NOI-MM-2: Employ Vibration-Reducing Construction Practices	Significant and unavoidable

Effect NOI-1: Exposure of Sensitive Receptors to Temporary Construction-Related Noise

Alternative 3—Construction Contract A

Table 3.7-28 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 3 Construction Contract A. This indicates that scattered rural residences could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-28. Summary of Predicted Construction Noise Levels under Alternative 3 Construction Contract A

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	90	1,602	9,006
2. Borrow site preparation	86	1,022	5,747
3. Levee degrading/work surface construction	93	2,189	12,312
4. Cutoff wall construction	90	1,515	8,519
5. Levee reconstruction/seepage and stability/berm construction	94	2,455	13,804
6. Borrow site excavation	90	1,575	8,857
7. Utility reconstruction	84	749	4,209
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	75	282	1,587
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 3—Construction Contract B

Table 3.7-29 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 3 Construction Contract B. This indicates that scattered rural residences and residences located in the south end of Yuba City could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-29. Summary of Predicted Construction Noise Levels under Alternative 3 Construction Contract B

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	90	1,602	9,006
2. Borrow site preparation	86	1,022	5,747
3. Levee degrading/work surface construction	93	2,189	12,312
4. Cutoff wall construction	90	1,515	8,518
5. Levee reconstruction	94	2,455	13,804
6. Borrow site excavation	90	1,575	8,857
7. Utility reconstruction	84	790	4,440
8. Levee resurfacing	85	923	5,190
9. Hydroseeding (concurrent with 8)	75	282	1,587
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 3—Construction Contract C

Table 3.7-30 summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 3 Construction Contract C. This indicates that scattered rural residences and residences located in Yuba City, Marysville, and Live Oak could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-30. Summary of Predicted Construction Noise Levels under Alternative 3 Construction Contract C

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	87	1,115	6,270
2. Borrow site preparation	86	1,022	5,747
3. Levee degrading/work surface construction	93	2,141	12,038
4. Cutoff wall construction	92	1,902	10,696
5. Levee reconstruction/seepage berm construction	93	2,184	12,281
6. Borrow site excavation	91	1,796	10,098
7. Utility reconstruction	80	518	2,915
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	78	378	2,126
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Alternative 3—Construction Contract D

Table 3.7-31summarizes construction noise levels and distances to the 60 dBA-L_{eq} and 45 dBA-L_{eq} noise contours for Alternative 3 Construction Contract D. This indicates that scattered rural residences and residences located in Gridley and Biggs could be exposed to noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during nighttime hours.

Table 3.7-31. Summary of Predicted Construction Noise Levels under Alternative 3 Construction Contract D

Construction Phase	Cumulative Noise Level at 50 Feet (dBA-L_{eq})	Distance to 60 dBA-L_{eq} Contour (feet)	Distance to 45 dBA-L_{eq} Contour (feet)
1. Clearing and grubbing/stripping	86	996	5,601
2. Borrow site preparation (concurrent with 1)	89	1,445	8,128
3. Levee degrading/work surface construction	93	2,131	11,985
4. Cutoff wall construction	91	1,715	9,643
5. Levee reconstruction	94	2,391	13,447
6. Borrow site excavation	91	1,829	10,283
7. Utility reconstruction	80	518	2,915
8. Levee resurfacing	85	923	5,190
9. Hydroseeding	78	378	2,126
10. Demobilization/cleanup	78	399	2,243

Note: In situations where there is substantial shielding between the activity and the receiver (i.e., receivers located on the opposite side of a levee when construction is occurring at the toe of the levee) sound levels would be about 5 dB less than shown, and distances would be about half the indicated distance.

Onsite Haul Truck Activity

Specific borrow site locations and onsite haul routes have not been defined. However, project engineers have stated that there would be up to 15 truck trips per day to each borrow site (Jabbour pers. comm.). This corresponds to 30 truck passes per day. Assuming these trips occur over a 10-hour work day (three passes per hour) at 25 miles per hour, the corresponding noise level at 50 feet is 45 L_{dn}. Because this value is less than 60 L_{dn}, the noise impact of haul trucks accessing borrow sites is considered to be less than significant.

Offsite Haul Truck Activity on Public Roads

Specific information on the daily volume of trucks that would travel on public roads has not been determined. However, it would take 50 truck passes per hour at 45 mph over a 10-hour work day (i.e., 500 passes or 250 total daily trips) on any given road to produce a sound level of 60 L_{dn} at 50 feet. Because it is not anticipated that this many trips will need to occur on any given public road, the noise impact of project trips on public roads is considered to be less than significant.

Alternative 3—Effect NOI-1 Conclusion

The results of the construction noise analysis above indicate that noise-sensitive uses could be exposed to construction noise exceeding 60 dBA-L_{eq} during daytime hours and 45 dBA-L_{eq} during

nighttime hours. The potential exposure of noise-sensitive receptors to construction noise is considered to be significant.

Noise from haul trucks on the designated onsite haul routes from borrow sites and on public roads is not expected to exceed 60 L_{dn} at adjacent residences and is therefore considered to be less than significant.

Mitigation Measure NOI-MM-1: Employ Noise-Reducing Construction Practices

A full description of NOI-MM-1 is presented above under the Alternative 1 discussion. Although implementation of this measure will reduce the effect, it is not anticipated that feasible measures will be available in all situations to reduce noise to below the applicable noise ordinance limits. This effect is therefore considered to be significant and unavoidable.

Effect NOI-2: Exposure of Sensitive Receptors to Temporary Construction-Related Vibration

Vibration from construction equipment is ~~would be~~ a primary concern when pile driving or another similar highly dynamic activity would occur. ~~Highly dynamic equipment such as this would not be employed under Alternative 3.~~ Table 3.7-21 summarizes typical construction vibration levels for various ~~the~~ types of dynamic equipment ~~that would be used on this project~~. Pile drivers are shown for reference only and are not anticipated to be used for this project. Other equipment listed could be used. Using methods specified in Federal Transit Administration (2006), distances are indicated within which vibration is estimated to exceed 0.2 inch per second.

Alternative 3—Effect NOI-2 Conclusion

It is anticipated that construction equipment would not typically operate within approximately 30 feet for residences and structures. However, there may be situations where this is required and where ground vibration could exceed 0.2 inch per second at residences and other structures. This effect is therefore considered to be significant.

Mitigation Measure NOI-MM-2: Employ Vibration-Reducing Construction Practices

A full description of NOI-MM-2 is presented above under the Alternative 1 discussion. Although implementation of this measure will reduce the effect, it is not anticipated that feasible measures will be available in all situations to reduce vibration to below the applicable levels. This effect is therefore considered to be significant and unavoidable.

3.8 Vegetation and Wetlands

3.8.1 Introduction

This section describes the regulatory and environmental setting for vegetation and wetlands; effects on vegetation and wetlands that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects. Additional information on vegetation and wetlands is provided in Appendix F.

3.8.2 Affected Environment

This section describes the affected environment for vegetation and wetlands in the biological study area, which is defined below in Section 3.8.2.2, *Environmental Setting*. Following are the key sources of data and information used in the preparation of this section.

- A California Natural Diversity Database (CNDDB) query for records pertaining to the biological study area, which includes portions of the following USGS 7.5-minute quadrangles that overlap the biological study area: Nicolaus, Yuba City, Sutter, Olivehurst, Biggs, Gridley, Palermo (Appendix F) (California Department of Fish and Game 2012).
- A USFWS list of endangered, threatened, and proposed species for the aforementioned seven USGS quadrangles (Appendix F) (U.S. Fish and Wildlife Service 2012).
- CDFW's List of Special Vascular Plants, Bryophytes, and Lichens (California Department of Fish and Game 2010).
- A list from the California Native Plant Society's (CNPS's) 2012 online Inventory of Rare and Endangered Plants for the aforementioned seven USGS quadrangles (Appendix F) (California Native Plant Society 2012).
- Delineation data collected by HDR Engineering, Inc., for wetlands and other waters in the biological study area in 2012, and information from an April 12, 2013 field review conducted by the USACE.
- Tree survey data collected by ICF in the fall of 2012.
- The California Department of Food and Agriculture's (CDFA's) Pest Ratings of Noxious Weed Species and Noxious Weed Seed (California Department of Food and Agriculture 2010).
- The California Invasive Plant Council's (Cal-IPC's) California Invasive Plant Inventory (California Invasive Plant Council 2006, 2007).
- General plans for counties and cities in the biological study area.
    - Butte County General Plan 2030 (Butte County 2010).
    - Sutter County General Plan, Public Draft (Sutter County 2010).
    - City of Yuba City General Plan (City of Yuba City 2004).
    - City of Biggs General Plan 1997–2015 (City of Biggs 1998).
    - City of Gridley 2030 General Plan (City of Gridley 2010).

  - City of Live Oak 2030 General Plan (City of Live Oak 2010).
- Draft habitat conservation plans/natural community conservation plans (HCPs/NCCPs) being prepared for the biological study area.
  - Butte County Regional HCP/NCCP (in preparation; status available at www.buttehcp.com).
  - Yuba-Sutter HCP/NCCP (in preparation; status available at www.yubasutterhcp.org).
- Existing SBFCA documents.
  - Biological Survey Memo for SBFCA Preliminary Environmental Planning Support for the Feather River West Levee Rehabilitation Early Implementation Project (Ladd pers. comm.).
  - Draft Sutter Basin Feasibility Study Environmental Without-Project Conditions Report (ICF International 2011).
  - Lower Feather River HUC/Honcut Creek Watershed Existing Conditions Assessment (Foothill Associates 2010).
  - Sutter Basin Feasibility Study—Restoration Opportunities, Measures, and Sponsors (ICF International 2010).

3.8.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to vegetation and wetlands. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to vegetation and wetlands may apply to implementation of the proposed project.

National Environmental Policy Act

NEPA was enacted to address concerns about environmental quality. NEPA acts to ensure that Federal agencies evaluate the potential environmental effects of proposed programs, projects, and actions before decisions are made to implement them, inform the public of Federal agency proposed activities that have the potential to significantly affect environmental quality, and encourage and facilitate public involvement in the decision-making process.

Federal Endangered Species Act

The Federal ~~Endangered Species Act (~~ESA~~)~~ of 1973 and subsequent amendments provide for the conservation of listed endangered or threatened species or candidates for listing and the ecosystems on which they depend. USFWS has jurisdiction over federally listed plants, wildlife, and resident fish, and NMFS has jurisdiction over anadromous fish and marine fish and mammals.

Endangered Species Act Authorization Process for Federal Actions (Section 7)

Section 7 of the ESA provides a means for authorizing take of threatened and endangered species by Federal agencies. It applies to actions that are conducted, permitted, or funded by a Federal agency. Under ESA Section 7, the lead Federal agency conducting, funding, or permitting an action must consult with USFWS or NMFS, as appropriate, to ensure that a proposed action will not jeopardize the continued existence of an endangered or threatened species or destroy or adversely modify

designated critical habitat. If a proposed action may affect a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment (BA) evaluating the nature and severity of the expected effect. In response, USFWS or NMFS issues a biological opinion (BO), with one of the following determinations about the proposed action.

- May jeopardize the continued existence of one or more listed species (*jeopardy finding*) or result in the destruction or adverse modification of critical habitat (*adverse modification finding*).
- Will not jeopardize the continued existence of any listed species (*no jeopardy finding*) or result in adverse modification of critical habitat (*no adverse modification finding*).

The BO issued by USFWS or NMFS may stipulate mandatory *reasonable and prudent measures* and *terms and conditions*. If it is determined the proposed project would not jeopardize the continued existence of a listed species, USFWS or NMFS would issue an incidental take statement to authorize the proposed activity.

Endangered Species Act Prohibitions (Section 9)

Section 9 prohibits removing, cutting, and maliciously damaging or destroying federally listed plants on sites under Federal jurisdiction. Take of threatened species also is prohibited under Section 9 unless otherwise authorized by Federal regulations.[1]

Clean Water Act

The CWA was enacted as an amendment to the Federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. The CWA serves as the primary Federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

The CWA empowers the EPA to set national water quality standards and effluent limitations and includes programs addressing both point-source and nonpoint-source pollution. *Point-source pollution* is pollution that originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. *Nonpoint-source pollution* originates over a broader area and includes urban contaminants in stormwater runoff and sediment loading from upstream areas. The CWA operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool. The following sections provide additional details on specific sections of the CWA.

Permits for Fill Placement in Waters and Wetlands (Section 404)

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States, which are oceans, bays, rivers, streams, lakes, ponds, and wetlands, including any or all of the following.

- Areas within the ordinary high water mark (OHWM) of a non-tidal stream or other water body, including nonperennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

[1] In some cases, exceptions may be made for threatened species under ESA Section 4[d]; in such cases, USFWS or NMFS issues a "4[d] rule" describing protections for the threatened species and specifying the circumstances under which take is allowed.

On January 9, 2001, the U.S. Supreme Court made a decision in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* (SWANCC) [121 S.CT. 675, 2001] that affected the USACE's jurisdiction in isolated waters. Based on SWANCC, USACE no longer has jurisdiction or regulates isolated wetlands (i.e., wetlands that have no hydrologic connection with a water of the United States).

~~More recently, a Federal ruling on two consolidated cases (June 19, 2006; *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers*), referred to as the *Rapanos decision*, affects whether some waters or wetlands are considered jurisdictional under the CWA. In these cases, the U.S. Supreme Court reviewed the USACE's definition of waters of the United States and whether or not it extended out to tributaries of navigable waters (TNW) or wetlands adjacent to those tributaries. The decision provided two standards for determining jurisdiction of water bodies that are not TNWs.~~

~~1. If the non-TNW is a relatively permanent water (RPW) or is a wetland directly connected to a RPW.~~

~~2. If the water body has *significant nexus* to a TNW. The significant nexus definition is based on the purpose of the CWA ("restore and maintain the chemical, physical, and biological integrity of the Nation's waters").~~

~~Guidance issued by the EPA and USACE on the Rapanos decision requires application of these two standards and use of substantially more documentation to support a jurisdictional determination for a water body.~~

Applicants must obtain a permit from the USACE for all discharges of dredged or fill material into waters of the United States, including adjacent wetlands, before proceeding with a proposed activity. USACE may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. The nationwide permits are a type of general permit issued to cover particular fill activities. Each nationwide permit specifies particular conditions that must be met for the nationwide permit to apply to a particular project.

Compliance with CWA Section 404 requires compliance with several other environmental laws and regulations. USACE cannot issue an individual permit or verify the use of a general permit until the requirements of NEPA, ESA, Fish and Wildlife Coordination Act, and the National Historic Preservation Act have been met. In addition, the USACE cannot issue or verify ~~any~~ an individual or general permit until a water quality certification or a waiver of certification has been issued pursuant to CWA Section 401. Details on compliance with each of these laws is in Chapter 5.

Water Quality Certification (Section 401)

Under CWA Section 401, applicants for a Federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a Federal component and may affect state water quality (including projects that require Federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401.

Permits for Stormwater Discharge (Section 402)

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the NPDES program, administered by EPA. In California, the State Water Board is authorized by EPA to oversee the NPDES program through the RWQCBs (see the related discussion under "Porter-Cologne Water Quality Control Act" in Section 3.2, *Water Quality and Groundwater Resources*). The biological study area is located within the jurisdiction of the Central Valley RWQCB.

NPDES permits are required for projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent (NOI) to discharge stormwater, and to prepare and implement a SWPPP. The SWPPP includes a site map and a description of proposed construction activities. In addition, it describes the BMPs that would be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

~~***Water Quality Certification (Section 401)***~~

~~Under CWA Section 401, applicants for a Federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a Federal component and may affect state water quality (including projects that require Federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401.~~

Engineer Technical Letter 1110-2-571 10 April 2009

In 2009, USACE published new Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures for the control of vegetation on levees (ETL 1110-2-571 10 April 2009). These guidelines recommend that a vegetation-free zone be established.

The vegetation-free zone is a three-dimensional corridor surrounding all levees, floodwalls, embankment dams, and critical appurtenant structures in all flood damage reduction systems. The vegetation-free zone applies to all vegetation except perennial, non-irrigated grass. ~~Grass species are permitted.~~ The only grasses permitted are perennial grasses whose primary function is to reliably protect against erosion. The species selected for the project shall be appropriate to local climate, conditions, and surrounding or adjacent land uses. Preference should be given to native species.

The primary purpose of a vegetation-free zone is to provide a reliable corridor of access to, or along, levees, floodwalls, embankment dams, and appurtenant structures. This corridor must be free of obstructions to assure adequate access by personnel and equipment for surveillance, inspection, maintenance, monitoring, and flood-fighting. In the case of flood-fighting, this access corridor must also provide the unobstructed space needed for the construction of temporary flood-control structures. Access is typically by four-wheel-drive vehicle, but for some purposes, such as maintenance and flood-fighting, access is required for larger equipment, such as tractors, bulldozers, dump trucks, and helicopters. Accessibility is essential to the reliability of flood damage reduction systems.

The vegetation-free zone must be wide enough and tall enough to accommodate all likely access requirements. The minimum width of the corridor shall be the width of the levee, floodwall, or embankment dam, including all critical appurtenant structures, plus 15 feet on each side, measured from the outer edge of the outermost critical structure. In the case of a landside planting berm, the 15 feet is measured from the point at which the top surface of the planting berm meets the levee section. The minimum height of the corridor shall be 8 feet from any point on the ground.

No vegetation, other than approved grasses, may penetrate the vegetation-free zone, with two exceptions.

- Tree trunks are measured to their centerline, so one half of the tree trunk may be within the vegetation-free zone.
- Newly planted trees, whose crowns can be expected to grow, or be pruned, clear of the vegetation-free zone within 10 years may be within the vegetation-free zone (U.S. Army Corps of Engineers 2009).

State

The following state policies related to vegetation and wetlands may apply to implementation of the proposed project.

California Environmental Quality Act

CEQA is the regulatory framework by which California public agencies identify and mitigate significant environmental effects. A project normally has a significant environmental effect on biological resources if it substantially affects a rare or endangered species or the habitat of that species; substantially interferes with the movement of resident or migratory fish or wildlife; or substantially diminishes habitat for fish, wildlife, or plants. The State CEQA Guidelines define rare, threatened, and endangered species as those listed under the ESA and the California Endangered Species Act (CESA) and any other species that meet the criteria of the resource agencies or local agencies (e.g., CDFW-designated species of special concern). The guidelines state that the lead agency preparing an EIR must consult with and receive written findings from CDFW concerning project effects on species listed as endangered or threatened. The effects of a proposed project on these resources are important in determining whether the project has significant environmental effects under CEQA.

California Endangered Species Act

California implemented the CESA in 1984. The act prohibits the take of listed endangered and threatened species. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. CDFW administers the act and authorizes take through Section 2081 agreements (except for species designated as fully protected).

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (CNPPA) prohibits importation of rare and endangered plants into California, take of rare and endangered plants, and sale of rare and endangered plants. The CESA defers to the CNPPA, which ensures that state-listed plant species are

protected when state agencies are involved in projects subject to CEQA. In this case, plants listed as rare under the CNPPA are not protected under CESA but rather under CEQA.

California Fish and Game Code (Section 1602)

Section 1602 of the California Fish and Game Code requires project proponents to notify CDFW before implementing any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. Any project modifications proposed by CDFW to address effects on biological resources (e.g., rivers, fish, wildlife) and protect those resources are formalized in a streambed alteration agreement that becomes part of the plans, specifications, and bid documents for the project.

Public Resources Code §21083.4

Section 21083.4 of the California Public Resources Code (instituted under SB 1334), established oak woodland conservation standards for CEQA processes within a county's jurisdiction. Counties are required to consider the significance of the conversion of oak woodlands, including a project's cumulative effect on oak woodlands statewide. The CEQA mitigation standards for project impacts on oak woodlands apply to oaks that have a diameter of 5 inches or more at a height of 4.5 feet above the ground. There are four CEQA oak woodlands mitigation alternatives that a project applicant can implement to mitigate significant impacts ~~to~~on oak woodlands:

- conserve oak woodlands through the use of conservation easements;
- plant an appropriate number of oak trees, including maintaining plantings for seven years and replacing dead or diseased trees;
- contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the California Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements; and
- other mitigation measures developed by the county where the project is located.

Counties are required to implement one or more of these four mitigation alternatives and the planting of oak trees cannot constitute more than 50% of the required mitigation.

Porter-Cologne Water Quality Control Act

California Water Code Section 13260 requires "any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements)." Under the Porter-Cologne Water Quality Control Act definition, waters of the state are "any surface water or groundwater, including saline waters, within the boundaries of the state." The SWANCC ruling, described above, has no bearing on the Porter-Cologne Water Quality Control Act definition. Although all waters of the United States that are within the borders of California are also waters of the state, the reverse is not true. Therefore, California retains authority to regulate discharges of waste into any waters of the state, regardless of whether USACE has concurrent jurisdiction under CWA Section 404. If USACE determines that a wetland is not subject to regulation under Section 404, CWA Section 401 water quality certification is not required. However, regional water quality control boards may impose waste discharge requirements if fill material is placed into waters of the state. The biological study area falls within

the jurisdiction of the Central Valley Regional Water Quality Control Board and SBFCA will apply for water quality certification from them.

Local

Sutter County, Butte County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley each have adopted policies related to vegetation and wetlands; these are detailed in Appendix A.

3.8.2.2 Environmental Setting

The following considerations are relevant to vegetation and wetland conditions in the proposed project area.

Biological Study Area

The biological study area for the proposed project consists of the most expansive construction footprint for the three FRWLP alternatives plus a 100-foot-wide buffer on either side of the levee to account for indirect effects and several potential borrow material sites (Plates 3.8-1 and 3.8-2). The biological study area is located in the Sacramento Valley subregion of the California Floristic Province (Baldwin et al. 2012:43). The biological study area is bounded by residential and commercial development, agriculture, recreation areas, dredge tailings, and riparian habitat.

Field Surveys

The field surveys pertaining to vegetation and wetlands that have been conducted for the proposed project are land cover mapping, special status–wildlife habitat identification, ~~and~~ a reconnaissance-level biological resource assessment, a delineation of potential wetlands and other waters of the United States, and a tree survey.

On November 9, 10, and 11, 2010, Galloway Consulting biologist Trish Ladd and ICF International geographic information systems (GIS) analysts Eric Link and Matt Ewalt mapped land cover types and identified special status–wildlife habitat in the biological study area (Ladd pers. comm. 2010). In July 2011, ICF International wildlife biologist Erin Hitchcock and botanist Jessica Hughes conducted a reconnaissance-level biological resource assessment of the biological study area to field-check current land cover conditions in the biological study area and update the 2010 mapping data as needed. The 2010 and 2011 field surveys were conducted using a combination of walking and driving through the biological study area and aerial photograph interpretation.

A delineation of wetlands and other waters was conducted by HDR Engineering in the summer and fall ~~June, July and August~~ of 2012 of ~~all~~ areas that may potentially be directly impacted by construction of the proposed ~~Project~~project, encompassing the footprint of the three proposed alternative construction designs and borrow site locations. USACE conducted a field review of the delineation with HDR biologists on April 12, 2013. ~~Potential borrow site locations will be surveyed in Fall/Winter 2012 and will be provided to USACE as an appendix to the October 2012 delineation report if potentially jurisdictional features are present.~~ICF International arborists conducted a tree survey within the footprint of the three proposed alternative construction designs in the fall of 2012. ~~Arborist surveys were started by ICF in 2012 and are still in progress. Partial survey results have been used in this draft and final survey results will be used in permit applications and the Final EIS/EIR.~~ No comprehensive~~protocol-level~~ floristic surveys have been conducted for the project; however, elderberry shrub surveys of the biological study area were~~as~~ conducted for the project in

2011 and 2012. Section 3.9, *Wildlife*, contains detailed information regarding the survey methodology and results.

Land Cover Types

The information pertaining to land cover types in the biological study area was derived using a combination of ~~primarily from~~ the collaborative mapping done in November 2010 by ICF International GIS staff and Galloway Consulting, ~~and updated as needed based on~~ the results of the 2011 reconnaissance-level biological assessment conducted by ICF International biologists, and the~~.~~ ~~The reconnaissance-level mapping of areas of open water was honed during a~~ delineation of ~~potential~~ wetlands and other waters of the United States conducted by HDR Engineering in ~~the summer of~~ 2012.

Land cover types in the biological study area are depicted in Plate 3.8-1 and fall into categories: wildlands, wetlands and other waters of the United States,~~open water,~~ agricultural lands, and developed/disturbed areas. The approximate acreages of the land cover types in the biological study area are listed in Table 3.8-1, and a description of each type is provided below.

Table 3.8-1. Acreages of Land Cover Types in the Biological and Wetland Delineation Study Area

Land Cover Type	Levee Construction Area[a]	Borrow Sites[a]	Total
Wildlands			
Riparian forest	147.11	0	147.11
Riparian scrub-shrub	33.10	7.86	40.96
Oak woodland	0.62	0	0.62
Wetlands and Other Waters of the United States[b]			
Forested/shrub wetland~~s~~	41.364	0	41.364
Seasonal wetland~~s~~	14.745	0	14.745
Open water	17.374	1.16	18.534
Tailings wetlands	9.175	3.59	12.765
Stream~~s~~/river	38.911	0	38.911
Ditch/canal	32.607	0	33.247
Pond/basin	3.327	0	3.327
Agricultural Lands			
Orchard~~s~~	1,188.29	9.43	1,19~~8~~7.72
Field and row crops	137.00	41.22	178.22
Developed/disturbed areas			
Developed	412.34	0.49	412.83
Ruderal	866.21	105.71	971.92

[a] Accuracy to 0.01 acre is subject to ±5% accuracy depending upon the accuracy of aerial imagery and topographic maps.
[b] Wetlands and Other Waters of the United States acreages are from the Approved Preliminary Jurisdictional Delineation for the Feather River West Levee Project dated May 1, 2013.

Wildlands

Riparian Forest

Riparian forest occurs on both sides of the levee, with the largest concentration occurring on the waterside along the Feather River. Riparian forest also ~~and its tributaries and~~ forms a fringe around some of the tailing ponds. Riparian forests support an overstory dominated by mature native and nonnative trees. The dominant overstory species are valley oak (*Quercus lobata*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), or Goodding's black willow (*Salix gooddingii*). Other trees commonly observed in the riparian forest are box elder (*Acer negundo* var. *californicum*), arroyo willow (*S. lasiolepis*), Oregon ash (*Fraxinus latifolia*), black locust (*Robinia pseudoacacia*) and western sycamore (*Platanus racemosa*). The shrub layer of most of the riparian forest in the biological study area is extremely dense, and species commonly observed are Himalayan blackberry (*Rubus armeniacus*), poison oak (*Toxicodendron diversilobum*), button bush (*Cephalanthus occidentalis*), wild rose (*Rosa* spp.) and blue elderberry (*Sambucus nigra* ssp*. caerulea*). Blue elderberry is the host plant for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), federally listed as threatened. Many of the trees and shrubs in the riparian forest are covered in California grape (*Vitis californica*). The herbaceous understory of riparian forest contains a mixture of native and introduced species. Representative species observed were horsetails (*Equisetum* spp.), mugwort (*Artemisia douglasian~~i~~a*), and curly dock (*Rumex crispus*). Several patches of the invasive giant reed (*Arundo donax*) occur along the edges of riparian areas. Some areas of riparian forest are considered wetlands and are discussed below under *Wetlands and Other Waters of the United States~~Open Water.~~*

Riparian Scrub-Shrub

Riparian scrub-shrub in the biological study area consists of areas on both sides of the levee that are dominated by shrubs such as willows (*Salix* spp.), blue elderberry, coyote brush (*Baccharis pilularis*), Himalayan blackberry, and button bush. The herbaceous understory of this land cover type is comparable to riparian forest. Some areas of riparian scrub-shrub are considered wetlands and are discussed below under *Wetlands and Other Waters of the United States.*

Oak Woodland

The biological study area contains several ~~Two~~ small patches of oak woodland ~~are located south of Almond Avenue and Laurel Avenue in the biological study area~~. The overstory of oak woodlands is predominantly ~~are dominated by~~ valley oak but some ornamental tree species are also present. The understory of oak woodland ~~and have an understory that~~ contains annual grasses mixed with native and nonnative forbs. Representative understory species are wild oat (*Avena* spp.), soft chess (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), field hedge parsley (*Torilis arvensis*), and the invasive yellow starthistle (*Centaurea solstitialis*).

Wetlands and Other Waters of the United States

The biological study area contains numerous features that are wetlands and other (i.e., non-wetland) waters of the United States. The information presented in this section pertaining to wetlands and other waters is based on summarized findings and data from the delineation conducted by HDR Engineering in 2012 and revisions requested by the USACE following the April 12, 2013 field review of the delineation by staff of the USACE.

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR §328.3[b]). In order for an area to be considered a wetland, it must exhibit positive indicators of all three Federal wetland criteria (hydrophytic vegetation, hydric soils, and wetland hydrology).

For other water features such as rivers, streams, and ditches, the extent of potential USACE jurisdiction is determined by identification of the OHWM, which is defined as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR §328.3[e]).

The types and acreages of the wetlands and other waters of the United States in the biological study area are listed above in Table 3.8-1. The descriptions of wetland and other waters below are based on summarized information from HDR Engineering.

Open Water

For the purposes of this EIS/EIR, the open water land cover type includes both agricultural and natural water bodies: irrigation ditches, open water, seasonal wetlands, riparian forest wetlands, streams, and tailing ponds. These water bodies were identified during a delineation of potential wetlands and other waters of the United States that was conducted by HDR Engineering in summer 2012 (see Potential Wetlands and Other Waters of the United States, below). Potential borrow site locations will be surveyed in Fall/Winter 2012 and will be provided to USACE as an appendix to the October 2012 delineation report if potentially jurisdictional features are present. The approximate acreage of each water body category within this land cover type is provided in Table 3.8-2.

Table 3.8-2. Approximate Acreages of Potential Jurisdictional Wetlands and Waters of the United States in the Biological Study Area*

Potential Jurisdictional Wetlands	Acres	Potential Jurisdictional Other Waters	Acres
Seasonal wetlands	20.27		
		Open water	11.96
Riparian forest	12.10	Irrigation ditch	0.19
Tailings ponds	14.66	Streams/Rivers	0.14

*Some jurisdictional feature classifications and acreage may overlap land cover type classifications. This table may be modified after the delineation of the borrow sites has been completed if potentially jurisdictional features are present.

Forested/Shrub Wetlands

Forested/shrub wetlands occur on the waterside of the levee along the margins of the Feather River (but are outside the OHWM of the river) and are concentrated in the southern half of the biological study area. The vegetation in riparian forest wetlands is comparable to that of non-wetland riparian forest and non-wetland riparian scrub-shrub (described above); however, the forested/shrub wetlands exhibit positive indicators of all three Federal wetland criteria.

Seasonal Wetlands

Areas categorized as seasonal wetlands consist of areas that are predominantly vegetated by either floating vegetation or emergent (rooted) vegetation. Common floating vegetation is filamentous

algae, common duckweed (*Lemna minor*), and bladderwort (*Utricularia* sp.). Typical emergent vegetation present is floating primrose willow (*Ludwigia peploides*), tall flatsedge (*Cyperus eragrostis*), lady's thumb (*Persicaria maculosa*), and narrowleaf cattail (*Typha angustifolia*). Seasonal wetlands are scattered throughout the southern half of the biological study area. Based on the absence of a plant community with species that are typically found only in vernal pools (e.g., coyote thistle [*Eryngium* sp.]), the seasonal wetlands in the biological study area were determined to not be vernal pools.

~~Other~~pen Waters~~

Areas categorized as open water following the USACE field review of the delineation consist of features where water is flowing or standing that contain sparse, if any, emergent vegetation. Open water features occur in tailings at the northern end of the biological study area and are interspersed with riparian habitats in the southern end of the biological study area.

Tailings Wetland

Tailings wetlands occur at the northern end of the biological study area and contain a mixture of floating and emergent vegetation bounded by shrubs and trees. Common floating and emergent species are common rush (*Juncus effusus*), tall flatsedge, lady's thumb, spikerush (*Eleocharis* spp.) floating primrose willow, and common duckweed. Typical shrubs and trees are Pacific willow (*Salix lasiandra*), Goodding's black willow, and valley oak.

Stream/River~~s~~

The biological study are contains two unnamed streams and the Feather River. The unnamed streams are located in the Feather River floodplain within Reach 16 and convey water at least seasonally (i.e., during the wetter winter months). The streams do not have an apparent link to the Feather River but likely have a hydrologic connection during times of high flow. The Feather River connects to the Sacramento River outside the biological study area.

Ditch/Canal

The drainage ditches and canals scattered within the biological study area are anthropogenic features that drain water from active agricultural lands during the growing season or following a rain event. They consist of the Sutter-Butte Canal, and other linear, concrete-lined features that convey water across multiple parcels. Many of these features are unvegetated; however, some support emergent vegetation or shrubs along their margins.

Pond/Basin

Ponds and basins in the biological study area consist of artificial and excavated depressions, some of which contain water year-round.

A wetland delineation verification letter from the USACE for the Feather River West Levee Project was received on May 1, 2013. A total of 162.893 acres of potential waters of the United States within the project boundary are subject to USACE regulation under CWA Section 404. The following table is from the Feather River West Levee Project Jurisdictional Delineation of Waters of the United States Report that summarizes each of the potential jurisdictional features within the Feather River Wetland Delineation Area (WDA). Table 3.8-2 lists each feature by the Contract Area, Reach number, Feature Classification, Feature Name that corresponds with each feature shown in the delineation

mapbook, and the total acres and linear feet, as applicable. The feature classifications are described above.

Table 3.8-2. Feather River West Levee Project Jurisdictional Delineation of Waters of the United States Summary of Potential Jurisdictional Areas by Feature Type and Project Area

Reach	Feature Classification	Feature Name	Mapbook Page #	Area (Acres)	Length (Linear Feet)
Potential Wetlands (Project Area A)					
2,3	Forested/Shrub Wetlands	FOREST 001	122-126	5.970	
2,3	Forested/Shrub Wetlands	FOREST 003	123-125	4.864	
4	Forested/Shrub Wetlands	FOREST 006 *	118-120	2.452	
4	Forested/Shrub Wetlands	FOREST 009 *	118	0.186	
4	Forested/Shrub Wetlands	FOREST 014 *	114-116	4.955	
4	Forested/Shrub Wetlands	FOREST 017 *	114, 115	0.396	
5	Forested/Shrub Wetlands	FOREST 028	110-112	4.584	
5	Forested/Shrub Wetlands	FOREST 029 *	110	0.008	
5	Forested/Shrub Wetlands	FOREST 030 *	110	0.010	
5	Forested/Shrub Wetlands	FOREST 031 *	110	0.003	
Subtotal Forested/Shrub Wetlands in Project Area A (Acres)				**23.428**	
4	Seasonal Wetlands	WET 008	118, 119	1.390	
4	Seasonal Wetlands	WET 011 *	118	1.240	
4	Seasonal Wetlands	WET 012 *	117	0.046	
4	Seasonal Wetlands	WET 013 *	116, 117	0.332	
4	Seasonal Wetlands	WET 019	114	0.414	
4,5	Seasonal Wetlands	WET 021	113,114	1.864	
5	Seasonal Wetlands	WET 024	112, 113	3.873	
5	Seasonal Wetlands	WET 026	111, 112	0.853	
5	Seasonal Wetlands	WET 027	110-112	3.133	
5	Seasonal Wetlands	WET 032	110	0.331	
Subtotal Seasonal Wetlands in Project Area A (Acres)				**13.475**	
Total Potential Wetlands in Project Area A (Acres)				**36.903**	
Potential Other Waters of the U.S. (Project Area A)					
2	Ditch/Canal	DITCH 001 *	126	0.125	487.37
2,3	Ditch/Canal	DITCH 002 *	122-126	1.597	7,067.93
3	Ditch/Canal	DITCH 003 *	121, 122	0.551	1,743.67
4	Ditch/Canal	DITCH 004 *	115	0.142	271.34
Subtotal Ditch/Canals in Project Area A (Acres/Linear Feet)				**2.415**	**9570.31**
2	Open Water	OPEN 002 *	126	0.644	
3	Open Water	OPEN 004 *	124	1.670	
3	Open Water	OPEN 005 *	123, 124	1.974	
4	Open Water	OPEN 007 *	119, 120	1.464	
4	Open Water	OPEN 010 *	118	0.067	
4	Open Water	OPEN 015 *	115, 116	0.402	

Reach	Feature Classification	Feature Name	Mapbook Page #	Area (Acres)	Length (Linear Feet)
4	Open Water	OPEN 016 *	115, 116	1.700	
4	Open Water	OPEN 018 *	114, 115	0.264	
4	Open Water	OPEN 020 *	114	0.579	
5	Open Water	OPEN 025 *	112	0.798	
Subtotal Open Water in Project Area A (Acres)				**9.560**	
3	Pond/Basin	POND 014 *	123	2.005	
Subtotal Pond/Basins for Project Area A (Acres)				**2.005**	
Total Potential Other Waters of the U.S. in Project Area A (Acres/Linear Feet)				**13.980**	**9,570.31**
Total Potential Wetlands and Other Waters in Project Area A (Acres/Linear Feet)				**50.883**	**9,570.31**
Potential Wetlands (Project Area B)					
7	Forested/Shrub Wetlands	FOREST 033	108, 109	3.193	
7	Forested/Shrub Wetlands	FOREST 034	107, 108	1.449	
7	Forested/Shrub Wetlands	FOREST 036	106, 107	1.393	
7	Forested/Shrub Wetlands	FOREST 038	105, 106	1.082	
11	Forested/Shrub Wetlands	FOREST 056	93, 94	1.702	
8	Forested/Shrub Wetlands	FOREST 057	104	0.037	
Subtotal Forested/Shrub Wetlands in Project Area B (Acres)				**8.857**	
Total Potential Wetlands in Project Area B (Acres)				**8.857**	
Potential Other Waters of the U.S. (Project Area B)					
7	Ditch/Canal	DITCH 006*	108, 109	0.385	3,107.56
9	Ditch/Canal	DITCH 007*	99	0.101	278.93
Subtotal Ditch/Canals in Project Area B (Acres/Linear Feet)				**0.486**	**3,386.49**
7	Open Water	OPEN 035*	107, 108	1.890	
7	Open Water	OPEN 037*	106, 107	2.408	
Subtotal Open Water in Project Area B (Acres)				**4.299**	
8-11	Stream/River	STREAM 103* (Feather River)**	91-94, 98-101	6.770	8,092.63
Subtotal Stream/Rivers in Project Area B (Acres/Linear Feet)				**6.770**	**8,092.63**
Total Potential Other Waters of the U.S. in Project Area B (Acres/Linear Feet)				**11.555**	**11,479.12**
Total Potential Wetlands and Other Waters in Project Area B (Acres/Linear Feet)				**20.412**	**11,479.12**
Potential Wetlands (Project Area C)					
16	Forested/Shrub Wetlands	FOREST 045	76, 77	0.876	
22	Forested/Shrub Wetlands	FOREST 046	54	0.577	
22	Forested/Shrub Wetlands	FOREST 047	51, 52	1.005	
23	Forested/Shrub Wetlands	FOREST 049	44, 45	1.034	
20	Forested/Shrub Wetlands	FOREST 050 *	60	1.257	
20	Forested/Shrub Wetlands	FOREST 051 *	62	0.084	
19	Forested/Shrub Wetlands	FOREST 052 *	63, 64	2.241	
13	Forested/Shrub Wetlands	FOREST 053 *	89	0.247	
24, 25	Forested/Shrub Wetlands	FOREST 058 *	43, 44	0.993	
Subtotal Forested/Shrub Wetlands in Project Area C (Acres)				**8.314**	

Reach	Feature Classification	Feature Name	Mapbook Page #	Area (Acres)	Length (Linear Feet)
17	Seasonal Wetlands	WET 041 *	74	0.546	
13	Seasonal Wetlands	WET 044 *	85	0.288	
Subtotal Seasonal Wetlands in Project Area C (Acres)				**0.834**	
Total Potential Wetlands in Project Area C (Acres)				**9.148**	
Potential Other Waters of the U.S. (Project Area C)					
21	Ditch/Canal	DITCH 009*	55-58	1.693	5,334.08
21-24	Ditch/Canal	DITCH 010* (Sutter Butte Canal)**	43, 44, 47, 48, 50-55	9.884	11,282.19
16	Ditch/Canal	DITCH 042*	78	0.029	124.46
23	Ditch/Canal	DITCH 048	48, 49	0.080	137.2
24-26	Ditch/Canal	DITCH 050*	40-44	1.349	3,127.10
20	Ditch/Canal	DITCH 125 *	62	0.050	238.04
Subtotal Ditch/Canals in Project Area C (Acres/Linear Feet)				**13.084**	**20,243.07**
16	Open Water	OPEN 041*	78	0.174	
Subtotal Open Water (Acres)				**0.174**	
16	Pond/Basin	POND 008*	77, 78	1.030	
13	Pond/Basin	POND 013 *	63, 64	0.185	
16	Pond/Basin	POND 040	78	0.100	
16	Pond/Basin	POND 041 *	78	0.007	
Subtotal Pond/Basins for Project Area C (Acres)				**1.322**	
16	Stream/River	STREAM 039	78, 79	0.830	834.95
16	Stream/River	STREAM 044*	77, 78	0.220	1,003.42
13-16, 19, 21-23	Stream/River	STREAM 103* (Feather River)**	45, 46, 52, 53, 56, 57, 64, 65, 79-81, 83-85	14.291	11,406.12
Subtotal Stream/Rivers in Project Area C (Acres/Linear Feet)				**15.341**	**13,244.49**
Total Potential Other Waters of the U.S. in Project Area C (Acres/Linear Feet)				**29.921**	**33,487.56**
Total Potential Wetlands and Other Waters in Project Area C (Acres/Linear Feet)				**39.069**	**33,487.56**
Potential Wetlands (Project Area D)					
36	Forested/Shrub Wetlands	FOREST 054	11	0.010	
29	Forested/Shrub Wetlands	FOREST 055	34	0.448	
40	Forested/Shrub Wetlands	FOREST 093	3	0.307	
Subtotal Forested/Shrub Wetlands in Project Area D (Acres)				**0.765**	
33	Tailings Wetlands	TAILING 052	17	0.020	
33	Tailings Wetlands	TAILING 053	17	0.030	
35	Tailings Wetlands	TAILING 054	13, 14	1.362	
35	Tailings Wetlands	TAILING 055	13	0.456	
36	Tailings Wetlands	TAILING 057	11, 12	0.005	
36	Tailings Wetlands	TAILING 058	11, 12	0.226	
37	Tailings Wetlands	TAILING 059	9, 10	0.289	
37	Tailings Wetlands	TAILING 060	9, 10	0.171	

Reach	Feature Classification	Feature Name	Mapbook Page #	Area (Acres)	Length (Linear Feet)
37	Tailings Wetlands	TAILING 061	9	0.022	
38	Tailings Wetlands	TAILING 062	6-9	1.359	
38	Tailings Wetlands	TAILING 063	7-9	0.281	
38	Tailings Wetlands	TAILING 064	7-9	0.192	
38	Tailings Wetlands	TAILING 065	6-8	0.021	
38	Tailings Wetlands	TAILING 066	6-8	0.171	
38, 39	Tailings Wetlands	TAILING 067	6-8	0.087	
39	Tailings Wetlands	TAILING 068	6-8	0.079	
39	Tailings Wetlands	TAILING 069	6-8	0.007	
39	Tailings Wetlands	TAILING 070	6-8	0.024	
39	Tailings Wetlands	TAILING 071	6-8	0.061	
38, 39	Tailings Wetlands	TAILING 072	5-8	0.165	
39	Tailings Wetlands	TAILING 073	5, 6, 8	0.058	
39	Tailings Wetlands	TAILING 074	5, 6, 8	0.202	
39	Tailings Wetlands	TAILING 075	5, 6	0.592	
39	Tailings Wetlands	TAILING 076	5-8	0.586	
39	Tailings Wetlands	TAILING 077	5, 6, 8	0.032	
39	Tailings Wetlands	TAILING 078	5, 6	0.024	
39	Tailings Wetlands	TAILING 079	5, 6	0.067	
40	Tailings Wetlands	TAILING 080	4-6	0.240	
40	Tailings Wetlands	TAILING 081	4-6	0.658	
40	Tailings Wetlands	TAILING 082	4-6	0.074	
40	Tailings Wetlands	TAILING 083	4-6	0.016	
40	Tailings Wetlands	TAILING 084	3-5	0.966	
40	Tailings Wetlands	TAILING 085	4, 5	0.023	
40	Tailings Wetlands	TAILING 086	3-5	1.453	
40	Tailings Wetlands	TAILING 087	4, 5	0.032	
40	Tailings Wetlands	TAILING 088	4, 5	0.013	
40	Tailings Wetlands	TAILING 089	4	0.018	
40	Tailings Wetlands	TAILING 090	3, 4	0.105	
40	Tailings Wetlands	TAILING 091	3, 4	0.161	
40	Tailings Wetlands	TAILING 092	3, 4	0.023	
40	Tailings Wetlands	TAILING 094	3	1.147	
40	Tailings Wetlands	TAILING 095	3	0.376	
40	Tailings Wetlands	TAILING 096 *	2, 3	0.156	
40	Tailings Wetlands	TAILING 097 *	3	0.218	
40	Tailings Wetlands	TAILING 098 *	3, 4	0.303	
37	Tailings Wetlands	TAILING 099 *	9	0.080	
34	Tailings Wetlands	TAILING 100 *	15	0.111	
Subtotal Tailings Wetlands in Project Area D (Acres)				**12.765**	
35	Seasonal Wetlands	WET 042 *	14	0.011	

Reach	Feature Classification	Feature Name	Mapbook Page #	Area (Acres)	Length (Linear Feet)
30	Seasonal Wetlands	WET 043 *	31, 32	0.425	
Subtotal Seasonal Wetlands in Project Area D (Acres)				**0.435**	
Total Potential Wetlands in Project Area D (Acres)				**13.966**	
Potential Other Waters of the U.S. (Project Area D)					
25-28, 31	Ditch/Canal	DITCH 010* (Sutter Butte Canal)**	24-27, 35-40	15.625	15,775.89
40, 41	Ditch/Canal	DITCH 011	1, 2	1.292	816.46
28	Ditch/Canal	DITCH 051	35	0.113	502.63
31	Ditch/Canal	DITCH 102	24	0.101	191.02
26	Ditch/Canal	DITCH 126 *	40	0.081	146.35
27	Ditch/Canal	DITCH 127 *	38	0.049	117.62
Subtotal Ditch/Canals in Project Area D (Acres/Linear Feet)				**17.262**	**17,549.96**
35	Open Water	OPEN 056	13	0.539	
36	Open Water	OPEN 096	11, 12	0.103	
38	Open Water	OPEN 097	6-9	0.553	
38	Open Water	OPEN 098	5-9	0.103	
38, 39	Open Water	OPEN 099	5-8	0.075	
39	Open Water	OPEN 100	5-8	0.347	
39	Open Water	OPEN 101	4-6	0.465	
40	Open Water	OPEN 102	3-5	1.122	
39	Open Water	OPEN 104	5, 8	0.296	
39	Open Water	OPEN 105	5	0.535	
42	Open Water	OPEN 106* (Thermalito After Bay)	1, 2	0.364	
Subtotal Open Water in Project Area D (Acres)				**4.501**	
28, 30, 31, 39-42	Stream/River	STREAM 103* (Feather River)**	1-4, 6, 7, 25-31, 34-36	16.800	12,787.35
Subtotal Stream/Rivers in Project Area D (Acres)				**16.800**	**12,787.35**
Total Potential Other Waters of the U.S. in Project Area D (Acres/Linear Feet)				**38.563**	**30,337.32**
Total Potential Wetlands and Other Waters in Project Area D (Acres/Linear Feet)				**52.529**	**30,337.32**

* These features do not have an associated field form or sample data; features were delineated from available topography and GIS aerial data.

** The Sutter Butte Canal and Feather River are large, linear features that fall within more than one Project Area. Each total shown represents only the acreage/linear feet found within that Project Area.

§§ Delineation Work was not conducted within the "Star Bend Mitigation Site" (Reach 6) as a Wetland Delineation was completed and submited to the USACE in 2008 by Stillwater Sciences.

Stillwater Sciences. 2008c. Delineation of jurisdictional waters and wetlands for the Feather River Levee Setback and Habitat Enhancement Project at Star Bend, Sutter County, California. Prepared for Levee District One of Sutter County, Yuba City, California.

Agricultural Lands

Most of the biological study area consists of agricultural lands (i.e., orchards and field and row crops).

Orchard~~s~~

Orchards are the dominant land cover type and occur throughout the biological study area. The majority of the orchards are almonds (*Prunus dulcis*), English walnuts (*Juglans regia*), plums (*Prunus* spp.), or peaches (*Prunus persica*) that are actively maintained (e.g., irrigated, pruned). The age of the orchards ranges from small, immature trees in protective sheaths to mature, established trees. The density of herbaceous vegetation in the areas between tree rows is highly variable and depends on the type and frequency of maintenance (e.g., mowing, herbicide application). Where present, the herbaceous vegetation is dominated by nonnative, weedy species.

Field and Row Crops

Most of the field and row crops are located in the southern portion of the biological study area (south of Barry Road). Field and row crops include both active and fallow fields that exhibit indicators of tillage. Common field and row crops in the biological study area are sweet corn, alfalfa, wheat, and tomatoes. Active field and row crops are maintained with irrigation and herbicide application. Alfalfa hay is harvested several times during the growing season. The margins of field and row crops typically support weed species.

Developed/Disturbed Areas

Developed

Developed areas in the biological study area consist of urban areas (residential and commercial development), ranchettes, rural neighborhoods, agricultural outbuildings, farm equipment storage areas, pumping stations, and a plant nursery.

Ruderal

Most of the areas mapped as ruderal occur as swaths on both sides of the centerline of the levee where the native soil has been substantially altered. The largest ruderal areas are located between Vance Avenue and the north terminus of the biological study area. Ruderal areas reflect past and ongoing disturbance associated with agriculture, levee construction and maintenance, and excavation (e.g., dredge tailings). The ruderal areas adjacent to the tailing ponds are more sparsely vegetated than the levee swaths due to a high density of large rock tailings. Scattered trees observed in ruderal areas are typically valley oak, Fremont cottonwood, and Goodding's black willow. Shrubs are scattered in ruderal areas, and species commonly observed are coyote brush, invasive tree tobacco (*Nicotiana glauca*), and Himalayan blackberry. Blue elderberry shrubs are also present in ruderal areas. The herbaceous layer of ruderal areas is dominated by annual grasses such as wild oat, soft chess, ripgut brome, and foxtail barley (*Hordeum murinum* ssp. *leporinum*). Numerous nonnative forbs such as yellow starthistle, prickly lettuce (*Lactuca serriola*), field hedge parsley, mustard (*Brassica* spp.), and rose clover (*Trifolium hirtum*) occur throughout ruderal areas. Native forbs observed in ruderal areas are Spanish lotus (*Acmispon americanus~~Lotus purshianus~~*), California poppy (*Eschscholzia californica*), annual fireweed (*Epilobium brachycarpum*), and western verbena (*Verbena lasiostachys*).

Sensitive Natural Communities

Sensitive natural communities are designated as such because of their high level of species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and Federal agencies consider these habitats important. The CNDDB maintains a current list of rare, natural communities throughout the state. Three sensitive natural communities recognized by the CNDDB have been reported in the 7.5-minute USGS quadrangles that overlap the biological study area: Great Valley cottonwood riparian forest, Great Valley mixed riparian forest, and northern hardpan vernal pool (California Department of Fish and Game 2012). The riparian forest in the biological study area could be considered either of these mapped CNDDB community types; therefore, it is a sensitive natural community. The riparian scrub-shrub, forested/shrub wetlands, and seasonal wetlands would also be considered sensitive natural communities. No vernal pools were observed in the biological study area during the 2010, ~~and~~ 2011, and 2012 field surveys.

~~Potential Wetlands and Other Waters of the United States~~

~~The biological study area contains approximately 59.32 acres of features that are potential wetlands and other (non-wetland) waters of the United States. According to the Federal Register (FR), wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR §328.3[b]). In order for an area to be considered a wetland, it must exhibit positive indicators of all three Federal wetland criteria (hydrophytic vegetation, hydric soils, and wetland hydrology). For other water features such as rivers, streams, and ditches, the extent of potential USACE jurisdiction is determined by identification of the OHWM, which is defined as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR §328.3[e]). A preliminary delineation of wetlands and other waters was conducted during summer 2012. The types and acreages of the potential wetlands and other waters in the biological study area (pending verification by the USACE Sacramento District) are listed in Table 3.8-2.~~

Special-Status Plant Species

Special-status plant species are plants that are legally protected under CESA, ESA, or other regulations, and species considered sufficiently rare by the scientific community to qualify for such listing. For the purposes of this document, special-status plant species fall into the following categories.

- Species listed or proposed for listing as threatened or endangered under ESA (CFR, Title 50, Section 17.12 [listed plants] and various notices in the FR (proposed species).
- Species that are candidates for possible future listing as threatened or endangered under the ESA (77 FR 69993, November 21, 2012~~76 FR 66370, October 26, 2011~~).
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (CCR, Title 14, Section 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the CNPPA (California Fish and Game Code Section 1900 et seq.).

- Plants considered by CDFW and CNPS to be "rare, threatened, or endangered in California" (Rare Plant Ranks 1B and 2; California Department of Fish and Game 2010; California Native Plant Society 2012).
- Plants identified by CDFW and CNPS about which more information is needed to determine their status, and plants of limited distribution (Rare Plant Ranks 3 and 4, California Department of Fish and Game 2010; California Native Plant Society 2012), which may be included as special-status species on the basis of local significance or recent biological information.

Nine special-status plant species have been reported in the seven USGS quadrangles that overlap the biological study area (California Department of Fish and Game 2010; California Native Plant Society 2012; California Department of Fish and Game 2012; U.S. Fish and Wildlife Service 2012). Table 3.8-3 lists the scientific name, common name, status, distribution, habitat requirements, and known/potential presence in the biological study area. ~~Two species, slender Orcutt grass (*Orcuttia tenuis*) and Greene's tuctoria (*Tuctoria greenei*) are vernal pool species that lack potential habitat in the biological study area. No vernal pools were observed in the biological study area during the 2010 and 2011 field surveys.~~

Table 3.8-3. Special-Status Plants Identified during Prefield Investigation as Having Potential to Occur in the Biological Study Area

Common and Scientific Name	Legal Status[a] Federal/State/ Rare Plant Rank	Geographic Distribution/Floristic Province	Habitat Requirements	Reported Blooming Period	Potential for Occurrence in Biological Study Area
Ferris's milk-vetch *Astragalus tener* var. *ferrisiae*	–/–/1B.1	Historical range included the Central Valley from Butte County to Alameda County but currently occurs only in Butte, Glenn, Colusa, and Yolo Counties	Seasonally wet areas in meadows and seeps, subalkaline flats in valley and foothill grassland; 2–75 meters	Apr–May	Low potential to occur in ruderal areas outside the toe of the levee, but habitat conditions of poor quality and suitable microhabitat may not be present.
Recurved larkspur *Delphinium recurvatum*	–/–/1B.2	Central Valley from Colusa* to Kern Counties	Alkaline soils in valley and foothill grassland, saltbush scrub, cismontane woodland; 3–750 meters	Mar–Jun	Low potential to occur in oak woodland and ruderal areas outside the toe of the levee, but habitat conditions of poor quality and suitable microhabitat may not be present.
Ahart's dwarf rush *Juncus leiospermus* var. *ahartii*	–/–/1B.2	Eastern Sacramento Valley, northeastern San Joaquin Valley with occurrences in Butte, Calaveras, Placer, Sacramento, and Yuba Counties	Mesic areas in valley and foothill grassland, vernal pool margins; 30–229 meters	Mar–May	Low potential to occur in ruderal areas outside the toe of the levee, but habitat conditions of poor quality and suitable microhabitat may not be present.
Veiny monardella *Monardella douglasii* ssp. *venosa*	–/–/1B.1	Occurrences in the northern and central Sierra Nevada foothills; also historically known from the Sacramento Valley	Heavy clay soils in cismontane woodland, valley and foothill grassland; 60–410 meters	May–Jul	Low potential to occur in oak woodland and ruderal areas outside the toe of the levee, but habitat conditions of poor quality and suitable microhabitat may not be present.
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	–/–/1B.1	Inner North Coast Ranges, western Sacramento Valley	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools; 5–1,740 meters	Apr–Jul	Low potential to occur in oak woodland and ruderal areas outside the toe of the levee, but habitat conditions of poor quality and suitable microhabitat may not be present.
Slender Orcutt grass *Orcuttia tenuis*	T/E/1B.1	Sierra Nevada and Cascade Range foothills from Siskiyou to Sacramento Counties	Vernal pools; 35–1,760 meters	May–Sep (uncommonly Oct)	No potential habitat in the biological study area.

Common and Scientific Name	Legal Status[a] Federal/State/ Rare Plant Rank	Geographic Distribution/Floristic Province	Habitat Requirements	Reported Blooming Period	Potential for Occurrence in Biological Study Area
Hartweg's golden sunburst *Pseudobahia bahiifolia*	E/E/1B.1	Central Sierra Nevada foothills, eastern San Joaquin Valley	Clay soils in cismontane woodland, valley and foothill grassland; 15–150 meters	Mar–Apr	Low potential to occur in ruderal areas outside the toe of the levee, but habitat conditions of poor quality and suitable microhabitat may not be present.
Sanford's arrowhead *Sagittaria sanfordii*	–/–/1B.2	Scattered locations in Central Valley and Coast Ranges from Del Norte to Fresno Counties	Freshwater marshes, sloughs, canals, and other slow-moving water habitats; below 2,132 feet	May–Oct	Moderate potential to occur based on presence of potential habitat (e.g., seasonal wetlands, tailings wetlands, inundated portions of the Feather River floodplain, margins of perennially inundated irrigation ditches/canals) and an occurrence in the Thermalito Afterbay but suitable microhabitat may not be present in anthropogenic habitats (e.g., canals).
Greene's tuctoria *Tuctoria greenei*	E/R/1B.1	Scattered distribution along eastern Central Valley and foothills from Shasta to Tulare Counties	Dry vernal pools; 30–1,070 meters	May–Jul (uncommonly Sep)	No potential habitat in the biological study area.

[a] Status explanations:

Federal

E = listed as endangered under the Federal Endangered Species Act.
T = listed as threatened under the Federal Endangered Species Act.
– = no listing.

State

E = listed as endangered under the California Endangered Species Act.
R = listed as rare under the CNPPA; no longer used for newly listed plants.
– = no listing.

California Rare Plant Rank**

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
0.1= seriously endangered in California.
0.2= fairly endangered in California.
* = presumed extirpated from that County.

** In March, 2010, CDFW changed the name of "CNPS List" or "CNPS Ranks" to "California Rare Plant Rank" (or CRPR). This was done to reduce confusion over the fact that CNPS and CDFW jointly manage the Rare Plant Status Review groups (300+ botanical experts from government, academia, nongovernmental organizations, and the private sector) and that the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.

[b] Floristic provinces as defined in Baldwin et al. 2012.

Two species, slender Orcutt grass (*Orcuttia tenuis*) and Greene's tuctoria (*Tuctoria greenei*) are vernal pool species that lack potential habitat in the biological study area. No vernal pools were observed in the biological study area during the 2010, 2011, and 2012 field surveys. Six of the remaining seven species were determined to have low potential for occurrence because the potential habitat (i.e., oak woodland, ruderal areas outside the toe of the levee) constitutes a relatively small portion of the biological study area and has been lowered in quality by past and ongoing disturbance (agricultural activities, dredging). Additionally, suitable microhabitat requirements (subalkaline flats, heavy clay soils, acidic clay soils) for these species may not be met. One species, Sanford's arrowhead, was determined to have moderate potential for occurrence in the seasonal wetlands, tailings wetlands, inundated portions of the Feather River floodplain (open water and forested/shrub wetlands), and the margins of perennially inundated irrigation canals based on the presence of potential habitat and a nearby occurrence reported in emergent marsh within the Thermalito Afterbay (1.46 miles away). However, the quality of some of the anthropogenic potential habitat types (e.g., tailings wetlands, irrigation canals) in the biological study area may not meet the habitat requirements of this species. ~~was determined to have low potential to occur based on the presence of potential habitat in freshwater emergent wetlands, tailing ponds, inundated portions of the Feather River floodplain, and the margins of perennially inundated irrigation canals/ditches.along the edges of irrigation canals, inundated areas of the river's floodplain within riparian forest, and ponds on the land side of the levee that support a fringe of riparian forest.~~

3.8.3 Environmental Consequences

This section describes the environmental consequences relating to vegetation and wetlands for the proposed project. It describes the methods used to determine the effects of the action and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the action, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.8.3.1 Assessment Methods

This evaluation of vegetation and wetlands is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

3.8.3.2 Determination of Effects

For this analysis, an effect pertaining to vegetation and wetlands was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- A substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by CDFW, NMFS, or USFWS.
- A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS.

- A substantial adverse effect on federally protected wetlands as defined by CWA Section 404 (including, but not limited to, marshes and vernal pools) through direct removal, filling, hydrological interruption, or other means.
- A conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- A conflict with the provisions of an adopted habitat conservation plan, natural communities conservation plan, or other approved local, regional, or state habitat conservation plan.

Effect Assumptions

The following assumptions were made regarding project effects on vegetation and wetlands in the biological study area.

- All project construction activities, including equipment staging and access, would take place only within the biological study area.
- As discussed in Chapters 1 and 2, the project is not intended to provide complete compliance with USACE's levee vegetation policy. Only the woody~~at~~ vegetation within the direct construction footprint would be removed by the project. While not proposed for removal by the FRWLP, woody vegetation would still be subject to USACE levee vegetation policy and may be removed as described under the No Action Alternative.
- There would be effects related to the routine operation or maintenance activities under the proposed project.
- All jurisdictional and riparian features would be avoided during borrow activities in Reach 36 through the northern extent of the project footprint.
- Discharge of fill into waters of the United States associated with the project would require a CWA Section 404 permit from the USACE Sacramento District, and CWA Section 401 certification from the Central Valley RWQCB, and may require a Rivers and Harbors Act Section 10 permit~~.~~. Before construction begins, SBFCA would obtain all necessary permits pertaining to affected waters of the United States. The permitting process would also require compensation for construction-, operation-, and maintenance-related effects.
- Grading would require a CWA Section 402 permit and preparation of a SWPPP.
- Grading or other construction activities within the bed, bank, or channel of the Feather River or its tributaries would require SBFCA to enter into a streambed alteration agreement from CDFW.
- Loss of agricultural and ruderal land cover types~~and annual grassland vegetation~~ would not be considered an adverse effect from a botanical standpoint because these habitats are ~~common and~~ not considered sensitive natural community types~~. They also are reestablished more easily after disturbance than riparian or wetland communities.~~ The loss of agricultural and ruderal land cover types in the biological study area~~annual grassland habitats~~ could be adverse for wildlife and are ~~, however, and this effect is~~ discussed in Section 3.9, *Wildlife*. Similarly, any adverse effects from these losses could affect farm lands, and are discussed in Section 3.11, *Agriculture, Land Use, and Socioeconomics*.

Effect Mechanisms

Vegetation and wetland resources could be directly and indirectly affected by the proposed project. The following types of activities could cause varying degrees of direct and indirect effects on these resources.

- Some degree of vegetation removal in levee measures at the onset of construction (clearing and grubbing).
- Grading and fill placement during construction of levee alternatives.
- Temporary stockpiling and sidecasting of soil, construction materials, and other construction wastes.
- Soil compaction, dust, and water runoff from the construction site into adjacent areas.
- Introduction or spread of invasive plant species into adjacent open space areas.
- Runoff of herbicides, fertilizers, diesel fuel, gasoline, oil, raw concrete, or other toxic materials used for levee alternatives, operations, and maintenance into sensitive biological resource areas (e.g., riparian habitat).

3.8.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning vegetation and wetlands are summarized in Table 3.8-4.

Table 3.8-4. Summary of Effects for Vegetation and Wetlands

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
Effect VEG-1: Disturbance or Removal of Riparian Trees	Significant	VEG-MM-1: Compensate for the Loss of Woody Riparian Trees VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor	Significant and unavoidable (short term) and less than significant (long term after establishment of compensatory vegetation)

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-2: Loss of Wetlands and Other Waters of the United States as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-5: Compensate for the Loss of Wetlands and Other Waters	Less than significant
Effect VEG-3: Disturbance or Removal of Protected Trees as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor ~~VEG-MM-6: Conduct a Tree Survey~~ VEG-MM-6~~7~~: Compensate for Loss of Protected Trees	Less than significant
Effect VEG-4: Potential Loss of Special-Status Plant Populations Caused by Habitat Loss Resulting from Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-7~~8~~: Retain Qualified Botanists to Conduct Floristic Surveys for Special-Status Plants during Appropriate Identification Periods VEG-MM-8~~9~~: Avoid or Compensate for Substantial Effects on Special-Status Plants	Significant and unavoidable
Effect VEG-5: Introduction or Spread of Invasive Plants as a Result of Project Construction	Less than significant	None required	Less than significant
Effect VEG-6: Conflict with Provisions of an Adopted HCP/NCCP or Other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

3.8.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies in levees along 41 miles of the west bank of the Feather River between the Sutter Bypass and Thermalito Afterbay. No levee improvements would be made to increase the level of protection. No construction-related effects on vegetation or wetlands would occur.

Because no levee improvements would be made under the No Action Alternative, the risk that the Feather River Levee could fail because of seepage or slope stability/geometry issues would continue. These effects could include significant loss of vegetation and habitat quality due to both the hydraulic forces of the flood itself and the clean-up efforts. However, given the uncertainty of the occurrence or magnitude of such an event, potential effects on vegetation and waters of the United States cannot be fully quantified based on available information.

Effect VEG-1: Disturbance or Removal of Riparian Trees

As presented in Chapter 2, implementation of the USACE levee vegetation policy under no action is characterized by two possible scenarios.

- Full application of the ETL, meaning prohibition and removal of woody vegetation within the levee prism or within 15 feet of the landside or waterside levee toes.
- Modified application of the ETL, assuming the continued existence into the future of the vegetation conditions at the time of the analysis. This may include future application of a variance (not as part of the FRWLP) or application of the CVFPP concepts for management of woody vegetation, meaning trimming and thinning to allow visibility and accessibility, selective retention and removal based on engineering inspection and evaluation, and LCM. A SWIF may also be a component of future compliance.

There are approximately 7,600 trees total in the biological study area, including riparian trees, orchards, and nonnative or ornamental trees. Under the full ETL, the only plant species permitted in the vegetation-free zone would be nonirrigated perennial grasses, with preference given to native species that are appropriate to local climate, conditions, and surrounding or adjacent land uses.

Under the full ETL application scenario, the number of trees that would need to be removed for full compliance is approximately 2,000. Permanent loss of woody vegetation to comply with USACE levee vegetation policy would result in significant effects on riparian habitat. These effects are considered significant and unavoidable in the short term, although it is assumed compensation vegetation would be required and the long-term effect would be less than significant after establishment of compensatory vegetation.

Under the modified ETL application scenario, the number of trees that would be removed to comply with a variance or levee inspection criteria is unknown, but would be expected to be relatively low. However, over time, much of the woody vegetation may be lost due to the natural life-cycle of each tree if not replaced, but substantial loss would not be expected to occur within 50 years or considerably longer in the case of long-lived riparian trees such as oaks and cottonwoods. Therefore, these effects are considered less than significant.

3.8.4.2 Alternative 1

Implementation of Alternative 1 would ~~potentially~~ result in effects on vegetation and wetlands. These ~~potential~~ effects and related mitigation measure requirements are summarized in Table 3.8-5 and discussed below. ~~The acreage of habitat loss under each alternative is provided in Table 3.8-6.~~

Table 3.8-5. Vegetation and Wetlands Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-1: Disturbance or Removal of Riparian Trees	Significant	VEG-MM-1: Compensate for the Loss of Woody Riparian Trees VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor	Significant and unavoidable (short term) Less than significant (long term after establishment of compensatory vegetation)
Effect VEG-2: Loss of Wetlands and Other Waters of the United States as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-5: Compensate for the Loss of Wetlands and Other Waters	Less than significant
Effect VEG-3: Disturbance or Removal of Protected Trees as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor ~~VEG-MM-6: Conduct a Tree Survey~~ VEG-MM-6~~7~~: Compensate for Loss of Protected Trees	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-4: Potential Loss of Special-Status Plant Populations Caused by Habitat Loss Resulting from Project Construction	Significant	VEG-MM-2 Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-7~~8~~: Retain Qualified Botanists to Conduct Floristic Surveys for Special-Status Plants during Appropriate Identification Periods VEG-MM-8~~9~~: Avoid or Compensate for Substantial Effects on Special-Status Plants	Significant and unavoidable
Effect VEG-5: Introduction or Spread of Invasive Plants as a Result of Project Construction	Less than significant	None required	Less than significant
Effect VEG-6: Conflict with Provisions of an Adopted HCP/NCCP or Other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

Table 3.8-6. Effects on Land Cover Types by Project Alternative*

Land Cover Types	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)
Wildlands			
Riparian forest	18.17	25.87	20.63
Riparian scrub-shrub	.63	1.08	1.09
Oak woodland	0.00	.03	NA
Subtotal	18.80	26.98	21.72
Open-Water Categories			
Irrigation ditch	0.00NA	0.00NA	0.00NA
Open water	24.36	28.72	9.02
Seasonal wetlands	0.00NA	0.00NA	0.00NA
Riparian forest wetland	0.00NA	0.00NA	0.00NA
Stream	0.00NA	0.00NA	0.00NA
Tailing ponds	0.00NA	0.00NA	0.00NA
Subtotal	24.36	28.72	9.02
Agricultural Lands			
Orchards	224.01	663.92	101.11
Field and row crops	17.42	92.61	2.95
Subtotal	241.43	756.53	104.06
Developed/Disturbed Areas			
Developed	222.15	257.46	188.11
Ruderal	522.82	548.42	498.45
Subtotal	744.97	805.88	686.56
Total	1029.56	1618.11	821.36

*These totals do not include borrow site acreages.

Effect VEG-1: Disturbance or Removal of Riparian Trees

The biological study area contains trees comprising riparian forest and riparian scrub-shrub on both sides of the levee. The land cover types are primarily based on species composition. However, for the purposes of assisting with regulatory jurisdiction and determination of floodplain effects, the riparian habitat types have been distinguished between the landside and waterside of the levee (e.g., riparian forest-landside and riparian forest-waterside).

Accordingly, impacts to trees in riparian communities resulting from the proposed project were quantified using only data for riparian trees that occur on the waterside of the levee.

Under Alternative 1, riparian trees on the waterside of the levees would be removed for construction of the proposed cutoff wall and seepage berms. The number and total diameter at breast height (dbh) of each species of riparian tree on the waterside of the levee being affected are listed in Table 3.8-6.

Table 3.8-6. Loss of Riparian Trees on the Waterside of the Levee by Project Alternative

	Alternative 1		Alternative 2		Alternative 3	
Tree Species	Number	Total dbh	Number	Total dbh	Number	Total dbh
Arroyo willow	2	16	2	16	2	16
Goodding's black willow	13	150	13	150	13	150
Box elder	1	4	1	4	1	4
Black walnut	32	532	32	532	32	532
Western sycamore	4	98	~~34~~	98	4	98
Fremont cottonwood	43	862	43	862	45	930
Interior live oak (*Quercus wislizeni*)	1	14	1	14	1	14
Oregon Ash	2	16	2	16	2	16
Valley oak	108	2,219	108	2,219	109	2,219
Total	206	3,911	206	3,911	209	3,979

dbh = diameter at breast height.

Therefore, construction of Alternative 1 would result in the total loss of 3,911 inches of dbh for riparian trees on the waterside of the levee. ~~remove a total of approximately 13.03 acres of riparian forest and 0.33 acre of riparian scrub-shrub (Table 3.8-6).~~

Loss of riparian trees~~habitats~~ on the waterside of the existing levee would be permanent because woody riparian restoration would not be permitted on the levees ~~or seepage berms~~ to comply with the USACE levee vegetation policy. The policy requires that the crown, slopes, and areas within 15 feet of the waterside and landside levee toes remain free of all woody vegetation. While not proposed for removal by the FRWLP, vegetation would still be subject to USACE levee vegetation policy and may be removed as described under the No Action Alternative.

As previously indicated, riparian communities~~, including cottonwood riparian woodland and valley oak riparian woodland,~~ are considered sensitive ~~natural communities~~by local, state, and Federal agencies and would be ~~by the CNDDB (California Department of Fish and Game 2012). These woodlands would be~~ regulated by CDFW and USFWS (46 FR 7644) under no-net-loss policies for existing riparian habitat values. Because implementation of the proposed project would result in a substantial adverse effect on riparian trees, this effect is considered significant. ~~Because the loss of riparian habitat as a result of the proposed project would be substantial, the disturbance and removal of riparian habitat would be considered a significant effect. Implementation~~

Implementation of the project would also result in the relocation of some of PG&E facilities (e.g., poles) currently located in the Alternative 1 construction footprint. These facilities would be relocated to areas that are outside the Alternative 1 construction footprint but still within the biological study area. PG&E is currently determining where their facilities would be relocated. It is anticipated that only a limited number of facilities would be relocated and that the impact areas associated with the relocations would be small; however, relocations could potentially affect riparian trees. Once the precise PG&E facility relocation sites are known, all areas of proposed ground disturbance will be screened to determine if they fall within areas that support or have the potential to contain riparian trees.

A site-specific review will be conducted to ensure that potential impacts to riparian trees are avoided to the extent possible or appropriate measures are taken if avoidance is not possible. This review will consist of a desk-top biological constraints report and/or a focused field study and associated report of findings, which discusses the potential for the occurrence of riparian trees in the relocation area. The report of findings will also include site-specific avoidance and minimization measures to avoid or reduce potential impacts to riparian trees as applicable. The precise method of review for each facility relocation will be determined in consultation with a PG&E biologist and/or environmental field specialist (EFS) Specialist. If riparian trees occur in the footprint of PG&E utility work, relocation activities may also contribute to significant effects on riparian trees in the biological study area.

Implementation of Mitigation Measures VEG-MM-1, VEG-MM-2, VEG-MM-3, and VEG-MM-4 would reduce this effect. Because of the length of time required for newly planted trees to reach mature size, this effect would be significant and unavoidable in the short term and less-than-significant in the long term after establishment of compensatory vegetation.

Mitigation Measure VEG-MM-1: Compensate for the Loss of Woody Riparian Trees

For direct effects on woody riparian trees that cannot be avoided, SBFCA will compensate for the loss of riparian habitat to ensure no net loss of habitat functions and values. Compensation ratios will be based on site-specific information and determined through coordination with the appropriate state and Federal agencies during the permitting process. Compensation will be provided based on the ratio determined (e.g., 2:1 = 2 acres restored/created/enhanced or credits purchased for every 1 acre removed). SBFCA has prepared a mitigation and monitoring plan (MMP) (included as Appendix F.3). Mitigation will consist of off-site, in-kind replacement habitat that is a combination of permittee-responsible mitigation and mitigation bank credits to allow for economy of scale and higher quality habitat due to large patch size. The plan identifies how and where mitigation will occur, monitoring and maintenance activities, success criteria, and funding assurances. The final mitigation and monitoring plan will be approved by the appropriate regulatory agencies prior to the removal of any riparian habitat. ~~Compensation may be a combination of offsite restoration or mitigation credits. SBFCA will develop a restoration and monitoring plan that describes how riparian habitat will be enhanced or recreated and monitored over a minimum period of time, as determined by the appropriate state and Federal agencies.~~

~~If SBFCA identifies onsite areas (adjacent to the levees) that are outside the USACE vegetation-free zone and chooses to compensate onsite or in the project vicinity, a revegetation plan will be prepared. The revegetation plan will be developed prior to the removal of existing riparian vegetation and will be conducted onsite or in the project vicinity to the extent feasible; however, mitigation site selection will avoid areas where future levee alternatives or maintenance is likely. The revegetation plan will be prepared by a qualified restoration ecologist and reviewed by the appropriate agencies. The revegetation plan will specify the planting stock appropriate for each riparian land cover type and each mitigation site, ensuring the use of genetic stock from the project area. The plan will employ the most successful techniques available at the time of planting. Success criteria will be established as part of the plan and will include a minimum of 80% revegetation success at the end of 5 years, 70% revegetation success after 3 years, and 75% vegetative coverage after 5 years.~~

~~SBFCA will monitor and maintain the plantings as necessary for 5 years, including weed removal, irrigation, and plant protection. SBFCA will submit annual monitoring reports of survival to the regulatory agencies issuing permits related to habitat effects, including DFG, USACE, NMFS, and USFWS. Replanting will be necessary if success criteria are not met, and replacement plants subsequently will be monitored and maintained to meet the success criteria. The riparian habitat mitigation will be considered successful when the sapling trees established meet the success criteria, the habitat no longer requires active management, and vegetation is arranged in groups that, when mature, replicate the area, natural structure, and species composition of similar riparian habitats in the region.~~

Mitigation Measure VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species

To clearly demarcate the project boundary and prevent special-status species from moving through the project area, SBFCA or its contractors will install temporary exclusion fencing along the project boundaries (including access roads, staging areas, etc.) 1 week prior to the start of construction activities. SBFCA will ensure that the temporary fencing is continuously maintained until all construction activities are completed and that construction equipment is confined to the designated work areas, including any offsite mitigation areas and access thereto. The fence will be made of suitable material that will not allow any of the special-status wildlife~~animals~~ with potential to occur in the project area to pass through or over, and the bottom will be buried to a depth of at least 4 inches to ensure~~such~~ that these species cannot crawl under the fence.

A USFWS- and a CDFW-approved biological monitor will be on-site during installation of the fencing to survey and relocate wildlife~~animals~~ outside the work area boundaries. Federally and state-listed species will be relocated only if authorized by the USFWS and CDFW. The exclusion fencing will be removed only after construction of the project phase is completed.

Exclusionary construction fencing and explanatory signage will also be placed around the perimeter of sensitive vegetation communities that could be affected by construction activities throughout the period during which such effects occur. Signage will explain the nature of the sensitive resource and warn that no effect on the community is allowed. The fencing will include a buffer zone of at least 20 feet between the resource and construction activities. All exclusionary fencing will be maintained in good condition throughout the construction period.

Mitigation Measure VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel

Before any work occurs in the biological study area, including grading, a qualified biologist will conduct mandatory contractor/worker awareness training for construction personnel. The awareness training will be provided to all construction personnel to brief them on the need to avoid effects on sensitive biological resources (e.g., riparian habitat, special-status species, special-status wildlife habitat) and the penalties for not complying with permit requirements. The biologist will inform all construction personnel about the life history of special-status species with potential for occurrence onsite, the importance of maintaining habitat, and the terms and conditions of the BO or other authorizing document. Proof of this instruction will be submitted to USFWS, CDFW, or other overseeing agency, as appropriate.

The training also will cover the restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on special-status species during project construction. The crew foreman will be responsible for ensuring that crew members adhere to the guidelines and restrictions. Educational training will be conducted for new personnel as they are brought on the job during the construction period. General restrictions and guidelines for vegetation (and wildlife) that must be followed by construction personnel are listed below.

- Project-related vehicles will observe the posted speed limit on hard-surfaced roads and a 10-mile-per-hour speed limit on unpaved roads during travel in the project site.
- Project-related vehicles and construction equipment will restrict offroad travel to the designated construction area.
- All food-related trash will be disposed of in closed containers and removed from the biological study area at least once a week during the construction period. Construction personnel will not feed or otherwise attract fish or wildlife to the project site.
- No pets or firearms will be allowed on the project site.
- To prevent possible resource damage from hazardous materials such as motor oil or gasoline, construction personnel will not service vehicles or construction equipment outside designated staging areas.

Any worker who inadvertently injures or kills a special-status wildlife species (discussed in Section 3.9, *Wildlife*) or finds one dead, injured, or entrapped will immediately report the incident to the biological monitor. The monitor will immediately notify SBFCA, who will provide verbal notification to the USFWS Endangered Species Office and/or the local CDFW warden or biologist within 3 working days. SBFCA will follow up with written notification to USFWS or CDFW within 5 working days.

Mitigation Measure VEG-MM-4: Retain a Biological Monitor

SBFCA or its contractors will retain qualified biologists to monitor construction activities adjacent to sensitive biological resources (e.g., special-status species, riparian habitat, wetlands, elderberry shrubs). The biologists will assist the construction crew, as needed, to comply with all project implementation restrictions and guidelines. In addition, the biologists will be responsible for ensuring that SBFCA or its contractors maintain the exclusion fencing~~construction barrier fencing~~ adjacent to sensitive biological resources.

Effect VEG-2: Loss of Wetlands and Other Waters of the United States as a Result of Project Construction

Construction of Alternative 1 would result in fill being placed in ~~the fill of~~ waterbodies that are waters of the state (regulated by RWQCB) and waters of the United States (including wetlands). The acreages of temporary and permanent effects on wetlands and other waters located within the project construction footprint of each alternative are listed in Table 3.8-7.

Table 3.8-7. Acreage of Effects on Land Cover Types by Project Alternative*

	Alternative 1		Alternative 2		Alternative 3	
Land Cover Types	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent
Wildlands						
Riparian forest	2.52	17.48	2.99	26.32	4.09	22.16
Riparian scrub-shrub	1.67	0.39	1.59	3.09	1.52	1.29
Oak Woodland	0.00	0.22	0.08	0.24	0.00	0.22
Subtotal	4.19	18.09	4.66	29.65	5.61	23.67
Wetlands and Other Waters of the United States						
Forested/shrub wetland	none	0.35	none	0.35	0.324	0.03
Seasonal wetland	none	0.18	0.01	0.19	0.011	0.026
Tailings wetland	none	0.14	0.14	0.58	0.074	0.131
Open water	0.05	0.17	0.01	0.62	none	0.038
Stream/river	none	none	none	none	none	none
Ditch/canal	0.94	24.96	0.78	27.54	7.195	0.207
Pond/basin	none	none	0.03	1.91	none	none
Subtotal	0.99	25.80	0.97	31.19	7.604	0.432
Agricultural Lands						
Orchard	40.48	223.39	42.72	666.70	10.00	101.71
Field and Row Crops	4.07	17.42	4.52	92.04	1.00	4.75
Subtotal	44.55	240.81	47.24	758.74	11	106.46
Developed/Disturbed Areas						
Developed	32.81	222.40	33.28	259.56	17.03	196.00
Ruderal	72.47	522.01	70.53	559.87	52.90	550.80
Subtotal	105.28	744.41	103.81	819.43	69.93	746.8

* Pending final design drawings of Contracts A, B & D.

Potential waters of the United States within the project boundary are subject to USACE regulation under CWA Section 404 in addition to regulation under CWA Section 401 by the Central Valley RWQCB. Wetlands are also considered sensitive natural communities. Because construction of this alternative would result in substantial, adverse effects on sensitive natural communities that would likely be determined to be federally protected wetlands, this effect is considered significant.

Implementation of the project would also result in the relocation of some PG&E facilities (e.g., poles) currently located in the Alternative 1 construction footprint. These facilities would be relocated to areas that are outside the Alternative 1 construction footprint but still within the biological study area. PG&E is currently determining where their facilities would be relocated. It is anticipated that only a limited number of facilities would be relocated and that the impact areas associated with the relocations would be small; however, relocations could potentially affect wetlands and other waters. Once the precise PG&E facility relocation sites are known, all areas of proposed ground disturbance will be screened to determine if they fall within areas that support or have the potential to contain wetlands and other waters.

A site-specific review will be conducted to ensure that potential impacts to wetlands and other waters are avoided to the extent possible or appropriate measures are taken if avoidance is not

possible. This review will consist of a desk-top biological constraints report and/or a focused field study and associated report of findings, which discusses the potential for the occurrence of wetlands and other waters in the relocation area. The report of findings will also include site-specific avoidance and minimization measures to avoid or reduce potential impacts to wetlands and other waters as applicable. The precise method of review for each facility relocation will be determined in consultation with a PG&E biologist and/or EFS Specialist. If wetlands and other waters occur in the footprint of PG&E utility work, relocation activities may also contribute to significant effects on wetlands and other waters in the biological study area.~~features that may be waters of the United States, including irrigation ditches, open water, and seasonal wetlands. Placement of fill would occur in jurisdictional features that are within the footprint of the cutoff wall and seepage berms.~~

~~Construction of Alternative 1 would result in the loss of 0.01 acre of irrigation ditch, 0.07 acre of open water, and 0.01 acre of seasonal wetlands (Table 3.8-6). This extent of effect is pending completion and verification of a delineation of waters of the United States and waters of the state in the project area.~~

~~Waters of the United States are regulated by USACE and waters of the state in California are regulated by the RWQCB. Wetlands are considered sensitive communities. The project would have a substantial adverse effect on federally protected wetlands and other waters of the United States through direct removal, filling, and hydrologic interruption; therefore, this effect would be considered significant.~~ Implementation of the environmental commitment to develop a SWPPP (Section 2.4.12, *Stormwater Pollution Prevention Plan*, of Chapter 2, *Alternatives*) and Mitigation Measures VEG-MM-2, VEG-MM-3, VEG-MM-4, and VEG-MM-5 would reduce this effect to a less-than-significant level.

Mitigation Measure VEG-MM-5: Compensate for the Loss of Wetlands and Other Waters

Compensation for the loss of wetlands will include restoring or enhancing in-kind wetland habitat ~~and open-water habitat~~ at a mitigation ratio that will be developed in coordination with regulatory agencies to ensure no net loss of habitat functions and values. SBFCA has prepared ~~a mitigation and monitoring plan~~an MMP (included as Appendix F.3). Mitigation will consist of off-site, in-kind replacement habitat that is a combination of permittee-responsible mitigation and mitigation bank credits to allow for economy of scale and higher quality habitat due to large patch size. The plan identifies how and where mitigation will occur, monitoring and maintenance activities, success criteria, and funding assurances. The final mitigation and monitoring plan will be approved by the appropriate regulatory agencies before the loss of any wetlands or waters.~~Before the removal of existing emergent wetland vegetation or open-water habitat, SBFCA will prepare a restoration plan to compensate for the loss of wetland and open-water habitat and submit the plan to the appropriate regulatory agencies for review.~~

~~The restoration plan will be prepared by a qualified restoration ecologist. The restoration plan will specify the planting stock appropriate for each wetland land cover type and each mitigation site, ensuring the use of genetic stock from the project area. The plan will employ the most successful techniques available at the time of planting. Success criteria will be established as part of the plan. The restoration will be conducted onsite or in the vicinity to the extent feasible, but mitigation site selection will avoid areas where future maintenance would be likely.~~

~~If offsite mitigation is necessary, a location that does not currently support wetlands but is capable of supporting wetland habitats will be selected. An area that currently supports minimal habitat value would be desirable. SBFCA will implement the restoration plan, maintain plantings~~

~~for a minimum of 5 years (including weed removal, irrigation, and plant protection), and conduct annual monitoring for 4 years, followed by monitoring every 2 years for the next 6 years. As feasible, existing native wetland vegetation from the affected sites will be harvested and maintained for replanting after construction.~~

Effect VEG-3: Disturbance or Removal of Protected Trees as a Result of Project Construction

Construction of Alternative 1 would result in the disturbance or removal of numerous trees that may be protected under local ordinances (e.g., Yuba City Ordinance 01-98) or meet the definition of oaks as defined under Public Resources Code Section 21083.4. Of the affected trees, the trees that occur in riparian communities on the waterside of the levee are discussed above for Effect VEG-1. The number and total dbh of each species of the remaining affected trees, which consists of trees in non-riparian communities on the water- and landsides of the levee and trees in riparian communities on the landside of the levee, are listed in Table 3.8-8.

Table 3.8-8. Effects on Trees that May be Protected Under Local Ordinances or Public Resource Code Section 21083.4 by Project Alternative

	Alternative 1		Alternative 2		Alternative 3	
Tree Species	Number	Total dbh	Number	Total dbh	Number	Total dbh
Arroyo willow	2	16	2	16	2	16
Black locust	5	35	5	35	4	28
Goodding's black willow	~~4~~13	150	105	935	59	546
Box elder	4	26	4	26	2	12
Black walnut	74	1,170	128	1,595	106	1,400
California buckeye (*Aesculus californica*)	1	6	1	6	1	6
Western sycamore	~~6~~9	201	9	201	~~6~~9	201
Edible fig (*Ficus carica*)	1	9	2	13	2	13
Eucalyptus (*Eucalyptus* sp.)	38	396	38	396	38	396
Fremont cottonwood	54	1,048	214	4,348	128	2,591
Hackberry (*Celtis* sp.)	2	22	2	22	2	22
Interior live oak (*Quercus wislizeni*)	7	41	7	41	7	41
London plane tree (*Platanus hybrida*)	~~2~~3	66	~~2~~3	66	2	54
Mulberry (*Morus alba*)	3	34	3	34	3	34
Orchard trees[a]	4,548	37,015	4,757	38,346	4,105	33,357
Oregon ash	2	16	2	16	2	16
Ornamental trees[a]	120	1,411	124	1,451	102	1,188
Pecan	3	38	3	38	3	38
Persimmon (*Diospyros virginiana*)	12	96	12	96	7	56
Redwood (*Sequoia* sp.)	21	239	21	239	20	215
Silk oak (*Quercus* sp.)	8	96	8	96	8	96
Tree-of-heaven (*Ailanthus altissima*)	30	254	36	286	28	257

	Alternative 1		Alternative 2		Alternative 3	
Tree Species	Number	Total dbh	Number	Total dbh	Number	Total dbh
Valley oak	393	5,931	783	9,896	571	7,792
Wild plum	16	78	49	277	26	144
Total	5,359	48,394	6,318	58,475	5,237	48,519

[a] Orchard trees include almonds, English walnut, peaches, and plums. Ornamental trees include species such as palms, crapemyrtle (*Lagerstroemia indica*), and privet (*Ligustrum* spp.).

~~Many of these affected trees are in riparian habitat and are included in the discussion in Effect VEG-2 above. Other trees occur in non-riparian valley oak woodland. The trees are within the footprint of the cutoff walls, seepage berms, O&M corridors, and utility corridors; and they would be removed during construction. Additional trees would be removed in the borrow areas.~~

~~Additional indirect effects on protected trees could occur during construction as a result of damage to trees located adjacent to the project footprint. Activities conducted within the dripline of trees, such as trenching or grading, movement of construction vehicles and equipment, and spillage or dumping of fuel, oil, concrete, or other harmful substances, could result in damage to root systems and possible tree mortality.~~

The removal or harming of protected trees as a result of construction activities would conflict with local ordinances and PRC Section 21083.4 (only applies to oak woodlands within a county's jurisdiction), and this would be a significant effect. Implementation of the project would also result in the relocation of some PG&E facilities (e.g., poles) currently located in the Alternative 1 construction footprint. These facilities would be relocated to areas that are outside the Alternative 1 construction footprint but still within the biological study area. PG&E is currently determining where their facilities would be relocated. It is anticipated that only a limited number of facilities would be relocated and that the impact areas associated with the relocations would be small; however, relocations could potentially affect protected trees. Once the precise PG&E facility relocation sites are known, all areas of proposed ground disturbance will be screened to determine if they fall within areas that support or have the potential to contain protected trees.

A site-specific review will be conducted to ensure that potential impacts to potential trees are avoided to the extent possible or appropriate measures are taken if avoidance is not possible. This review will consist of a desk-top biological constraints report and/or a focused field study and associated report of findings, which discusses the potential for the occurrence of protected trees in the relocation area. The report of findings will also include site-specific avoidance and minimization measures to avoid or reduce potential impacts to protected trees as applicable. The precise method of review for each facility relocation will be determined in consultation with a PG&E biologist and/or EFS Specialist. If protected trees occur in the footprint of PG&E utility work, relocation activities may also contribute to significant effects on protected trees in the biological study area.

Implementation of the environmental commitment to comply with each city tree ordinance and where applicable, PRC Section 21083.4 , as they ~~it~~ pertains to the segment location for all project alternatives (Section 2.4.6, *Measures for Protected and Riparian Trees*, of Chapter 2, *Alternatives*) and Mitigation Measures VEG-MM-2, VEG-MM-3, VEG-MM-4, and VEG-MM-6~~, and VEG-MM-7~~ would reduce this effect to a less-than-significant level.

~~**Mitigation Measure VEG-MM-6: Conduct a Tree Survey**~~

~~SBFCA will retain a certified arborist to conduct a tree survey in the project area to identify trees protected under city tree ordinances. The arborist will document the results of the tree survey in a report that includes the location, species, size (diameter at breast height), overall health, and dripline diameter of the trees. For all protected trees to be removed in the project area, SBFCA will implement Mitigation Measure VEG-MM-7.~~

Mitigation Measure VEG-MM-6~~7~~: Compensate for Loss of Protected Trees

For impacts on protected trees that fall under the jurisdiction of a local tree ordinance, SBFCA will apply for a tree permit for the removal of any protected trees during construction. SBFCA will replace trees that must be removed with trees at or near the location of the effect or another location approved by the appropriate party (e.g., tree administrator, parks and recreation department). SBFCA also will replace any replacement trees that die within 3 years of the initial planting.

Replacement trees are required at a ratio of 1:1 (i.e., 1-inch diameter of replacement tree~~plant~~ for every 1-inch diameter of tree removed). Effects on trees also may be mitigated through payment of an in-lieu fee. Mitigation will be subject to approval by the appropriate party and will take into account species affected, replacement species, location, health and vigor, habitat value, and other factors to determine fair compensation for tree loss.

For impacts on protected trees in oak woodlands under a county's jurisdiction, SBFCA will implement one of the four CEQA oak woodlands mitigation alternatives to compensate for the loss of projected trees and the planting of oaks will not constitute more than 50% of the required mitigation.

Effect VEG-4: Potential Loss of Special Status–Plant Populations Caused by Habitat Loss Resulting from Project Construction

No known occurrences of special-status plants are in the Alternative 1 project area; however, appropriately-timed floristic surveys of the~~blooming-period surveys of the~~ project area have not been conducted for special-status plant species with potential to occur in the region. Because of the historical and ongoing disturbance of most of the project area, there is low potential for the presence of special-status plants, but if one or more of these species are present in the project area, project construction would result in their removal.

Nearly all improvement measures associated with Alternative 1 require clearing and grubbing of the project footprint prior to construction. If special-status plants are present within the project footprint, they would be removed.

Implementation of Alternative 1 would also result in the relocation of some PG&E facilities (e.g., poles) currently located in the project alternative construction footprint. These facilities would be relocated to areas that are outside the project alternative construction footprint but still within the biological study area. PG&E is currently determining where their facilities would be relocated. It is anticipated that only a limited number of facilities would be relocated and that the impact areas associated with the relocations would be small; however, relocations could potentially affect special-status plant populations. Once the precise PG&E facility relocation sites are known, all areas of proposed ground disturbance will be screened to determine if they fall within areas that support or have the potential to contain special-status plant populations.

A site-specific review will be conducted to ensure that potential impacts to special-status plant populations are avoided to the extent possible or appropriate measures are taken if avoidance is not possible. This review will consist of a desk-top biological constraints report and/or a focused field study and associated report of findings, which discusses the potential for the occurrence of special-status plant populations in the relocation area. Appropriately-timed floristic surveys would be required in areas where PG&E facilities are located in land cover types that represent potential special-status plant habitat. The report of findings will also include site-specific avoidance and minimization measures to avoid or reduce potential impacts to special-status plant populations as applicable. The precise method of review for each facility relocation will be determined in consultation with a PG&E biologist and/or EFS Specialist. If special-status plant populations occur in the footprint of PG&E utility work, relocation activities may also contribute to significant effects on special-status plant populations in the biological study area.

Plants that may occur in the ~~project area under this alternative~~biological study area include one federally and state–listed endangered species (Hartweg's golden sunburst) and seven species that have been assigned a California Rare Plant Rank (CRPR) by CDFW~~are on the CNPS list for rare and endangered plants~~. The loss of a CRPR species~~Loss of CNPS-listed plant species~~ may be considered significant under CEQA and regulated by CDFW if the loss is substantial and could affect the long-term survival of the affected population. Because the presence and extent of any special-status plants in the project construction area are unknown, this effect is potentially significant ~~would be a significant effect~~.

Depending on the plant (listed versus unlisted) and the extent of effect on the population, implementation of Mitigation Measures VEG-MM-2, VEG-MM-3, and VEG-MM-4 may avoid or reduce this future effect to a less-than-significant level. The final significance determination will need to be made after floristic surveys have been conducted (Mitigation Measure VEG-MM-7~~8~~) and through consultation with the appropriate resource agency (USFWS and/or CDFW). In addition, Mitigation Measure VEG-MM-8~~9~~ requires the project proponent to avoid indirect or direct effects on special-status plants wherever feasible. Because the effectiveness of these measures to reduce this effect to a lesser level is not known at this time, this effect is considered significant and unavoidable.

Mitigation Measure VEG-MM-7~~8~~: Retain Qualified Botanists to Conduct Floristic Surveys for Special-Status Plants during Appropriate Identification Periods

SBFCA will retain qualified botanists to survey the biological study area to document the presence of special-status plants before project implementation. The botanists will conduct a floristic survey that follows the CDFW botanical survey guidelines (California Department of Fish and Game 2009) starting in the spring of 2013. All plant species observed will be identified to the level necessary to determine whether they qualify as special-status plants or are plant species with unusual or significant range extensions. The guidelines also require that field surveys be conducted when special-status plants that could occur in the area are evident and identifiable, generally during the reported blooming period. To account for different special status–plant identification periods, one or more series of field surveys may be required in spring and summer.

If any special-status plants are identified during the surveys, the botanist will photograph and map locations of the plants, document the location and extent of the special status–plant population on a CNDDB Survey Form, and submit the completed Survey Form to the CNDDB. The amount of compensatory mitigation required will be based on the results of these surveys.

Mitigation Measure VEG-MM-8~~9~~: Avoid or Compensate for Substantial Effects on Special-Status Plants

If one or more special-status plants are identified in the study area during preconstruction surveys, SBFCA will redesign or modify proposed project components of the project to avoid indirect or direct effects on special-status plants wherever feasible. If special-status plants can be avoided by redesigning projects, implementation of Mitigation Measures VEG-MM-2 (barrier fencing), VEG-MM-3 (awareness training), and VEG-MM-4 (biological monitor) would avoid significant effects on special-status plants.

If complete avoidance of special-status plants is not feasible, the effects of the project on special-status plants would be compensated for by offsite preservation at a ratio to be negotiated with the resource agencies. Suitable habitat for affected special status–plant species will be purchased in a conservation area, preserved, and managed in perpetuity. Detailed information will be provided to the agencies on the location and quality of the preservation area, the feasibility of protecting and managing the area in perpetuity, and the responsible parties. Other pertinent information also will be provided, to be determined through future coordination with the resource agencies.

Effect VEG-5: Introduction or Spread of Invasive Plants as a Result of Project Construction

Invasive plants are already present in the Alternative 1 project area. However, construction activities and relocation of PG&E facilities could introduce new invasive plants to the project area or contribute to the spread of existing invasive plants to uninfested areas outside the project area. Invasive plants or their seeds may be dispersed by construction equipment if appropriate prevention measures are not implemented. The introduction or spread of invasive plants as a result of the project could have a significant effect on sensitive natural communities within and outside the project area by displacing native flora. ~~The~~ SBFCA and PG&E will implement~~ation of~~ the appropriate BMPs described in the environmental commitment to avoid or minimize the spread or introduction of invasive plant species (Section 2.4.7, *Invasive Plant Species Prevention Measures*, of Chapter 2, *Alternatives*) ~~will~~ to ensure that the proposed project and PG&E facility relocations would not have a significant effect on sensitive natural communities from the introduction or spread of invasive plants. With implementation of the environmental commitment, this would be a less-than-significant effect. No additional mitigation is required.

Effect VEG-6: Conflict with Provisions of an Adopted HCP/NCCP or Other Approved Local, Regional, or State Habitat Conservation Plan

There are no adopted HCP/NCCPs applicable to the proposed project. There are two plans under development in the region: the Yuba-Sutter NCCP/HCP and the Butte Regional Conservation Plan. The proposed project and potential PG&E facility relocation sites are~~is~~ within the plan area of both of these conservation plans. Because neither of these plans has been adopted, neither the project nor the relocation of PG&E facilities as a result of project implementation would ~~not~~ conflict with provisions of these plans, and there would be no effect.

In conclusion, implementation of Alternative 1 would result in the smallest affected acreage of wildland land cover types, including habitats such as riparian forest that are sensitive natural communities and/or represent potential habitat for special-status species, compared to Alternatives 2 and 3 (Table 3.8-8). Alternative 1 would result in the same affected acreage of open

water categories as Alternative 2 but less affected acreage than Alternative 3 (Table 3.8-8). All three alternatives have the potential to affect special-status plant populations.

3.8.4.3 Alternative 2

Implementation of Alternative 2 would ~~potentially~~ result in effects on vegetation and wetlands. These ~~potential~~ effects and related mitigation measure requirements are summarized in Table 3.8-9 and discussed below.

Table 3.8-9. Vegetation and Wetlands Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-1: Disturbance or Removal of Riparian Trees	Significant	VEG-MM-1: Compensate for the Loss of Woody Riparian Trees VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor	Significant and unavoidable (short term) Less than significant (long term after establishment of compensatory vegetation)
Effect VEG-2: Loss of Wetlands and Other Waters of the United States as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-5: Compensate for the Loss of Wetlands and Other Waters	Less than significant
Effect VEG-3: Disturbance or Removal of Protected Trees as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor ~~VEG-MM-6: Conduct a Tree Survey~~ VEG-MM-~~6~~7: Compensate for Loss of Protected Trees	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-4: Potential Loss of Special-Status Plant Populations Caused by Habitat Loss Resulting from Project Construction	Significant	VEG-MM-2 Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-7~~8~~: Retain Qualified Botanists to Conduct Floristic Surveys for Special-Status Plants during Appropriate Identification Periods VEG-MM-8~~9~~: Avoid or Compensate for Substantial Effects on Special-Status Plants	Significant and unavoidable
Effect VEG-5: Introduction or Spread of Invasive Plants as a Result of Project Construction	Less than significant	None required	Less than significant
Effect VEG-6: Conflict with Provisions of an Adopted HCP/NCCP or Other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

The measures proposed for Alternative 2 would extend substantially beyond the current footprint of the Feather River West Levee. Implementation of Alternative 2 would result in the same types of effects (i.e., Effect VEG-1 through Effect VEG-6) on vegetation and wetland resources as Alternative 1. I~~However, i~~mplementation of Alternative 2 would result in the same effects on riparian trees as Alternative 1 ~~greater effects on certain land cover types (e.g., riparian forest, riparian scrub-shrub) that are sensitive natural communities and/or represent potential habitat for special-status species~~ (Table 3.8-6). There would be fewer temporary effects on potential wetlands and other waters of the United States compared to Alternatives 1 and 3; however, there would be more permanent effects than for either of those alternatives (Table 3.8-7). There would be greater effects on potentially protected trees compared to Alternative 1 (Table 3.8-8). The mitigation measures to reduce these effects are identical to those described for Alternative 1.

3.8.4.4 Alternative 3

Implementation of Alternative 3 would ~~potentially~~ result in effects on wetlands and vegetation. These ~~potential~~ effects and related mitigation measure requirements are summarized in Table 3.8-10 and discussed below.

Table 3.8-10. Vegetation and Wetlands Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-1: Disturbance or Removal of Riparian Trees	Significant	VEG-MM-1: Compensate for the Loss of Woody Riparian Trees VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor	Significant and unavoidable (short term) Less than significant (long term after establishment of compensatory vegetation)
Effect VEG-2: Loss of Wetlands and Other Waters of the United States as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-5: Compensate for the Loss of Wetlands and Other Waters	Less than significant
Effect VEG-3: Disturbance or Removal of Protected Trees as a Result of Project Construction	Significant	VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor ~~VEG-MM-6: Conduct a Tree Survey~~ VEG-MM-6~~7~~: Compensate for Loss of Protected Trees	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect VEG-4: Potential Loss of Special-Status Plant Populations Caused by Habitat Loss Resulting from Project Construction	Significant	VEG-MM-2 Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel VEG-MM-4: Retain a Biological Monitor VEG-MM-7~~8~~: Retain Qualified Botanists to Conduct Floristic Surveys for Special-Status Plants during Appropriate Identification Periods VEG-MM-8~~9~~: Avoid or Compensate for Substantial Effects on Special-Status Plants	Significant and unavoidable
Effect VEG-5: Introduction or Spread of Invasive Plants as a Result of Project Construction	Less than significant	None required	Less than significant
Effect VEG-6: Conflict with Provisions of an Adopted HCP/NCCP or Other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

Implementation of Alternative 3, which is a blend of levee improvement measures from Alternatives 1 and 2, would result in the same types of effects (i.e., Effect VEG-1 through Effect VEG-6) on vegetation and wetland resources as Alternatives 1 and 2. Implementation of Alternative 3 would result in slightly greater effects on riparian trees compared to Alternatives 1 and 2 (Table 3.8-6). There would be more temporary effects on potential wetlands and other waters of the United States compared to Alternatives 1 and 2; however, there would be substantially fewer permanent effects than for the other two alternatives (Table 3.8-7). The effects on potentially protected trees would be less than Alternative 2 but greater than Alternative 1 (Table 3.8-8). ~~on oak woodland and the open water land cover type than Alternatives 1 and 2 (Table 3.8-6). Implementation of Alternative 3 would result in a higher affected acreage of riparian habitats than Alternative 1, but a smaller affected acreage than Alternative 2.~~ The mitigation measures to reduce these effects are identical to those described for Alternatives 1 and 2.

Alternative 3 has been evaluated in more detail to ensure compliance with the CWA, including Sections 404 and 401. The proposed project appears to qualify under the Nationwide Permit Program. All conditions of the NWP will be implemented to minimize and avoid water quality impacts. Table 3.8-11 below summarizes the effects to each wetland and Other Waters of the United States and is shown on Figure 3.8-1 for each Contract.

Table 3.8-11. Alternative 3 Clean Water Act Section 404 Effects on Wetlands and Other Waters of the United States

Contract	St#	Feature Name	Classification	Perm	Temp	Total	Activity
A	210	Ditch 01	Ditch/Canal	0.066		0.066	Seepage berm
A	220 – 280	Ditch 02	Ditch/Canal		0.456	0.456	Cutoff wall
A	290 – 300	Ditch 03	Ditch/Canal		0.551	0.551	Cutoff wall
A	395	Ditch 04	Ditch/Canal	0.003		0.003	Cutoff wall
A	410	OPEN 20	Open Water	0.038		0.038	Cutoff wall
A	410	WET 21	Seasonal Wetland	0.026		0.026	Cutoff wall
A	470 – 474	Forest 28	Forested/ shrub wetland		0.324	0.324	Cutoff wall
A Total				**0.134**	**1.33**		
B	515 – 545	Ditch 06	Ditch/Canal		0.385	0.385	Cutoff wall
B	690	Ditch 07	Ditch/Canal	0.001		0.001	Cutoff wall
B Total				**0.001**	**0.385**		
C	1043 + 50	DITCH 42	Ditch/Canal	0.006	0.008	0.014	Armoring of outfall
C	1315	Ditch 125	Ditch/Canal	0.002		0.002	Cutoff wall
C	1315	Forest 051	Forested/ shrub wetland	0.028		0.028	Cutoff wall
C	1346	Forest 050	Forested/ shrub wetland	0.002		0.002	Cutoff wall
C	1390	Ditch 09	Ditch/Canal		0.007	0.007	Cutoff wall
C	1610	Ditch 10	Ditch/Canal	0.016	0.033	0.049	Cutoff wall
C Total**				**0.054**	**0.048**		
D	1675	DITCH 50	Ditch/Canal		0.017	0.017	Cutoff wall
D	1680 – 1940	Ditch 10	Ditch/Canal		5.738	5.738	Cutoff wall/ levee degrade
D	1760	DITCH 51	Ditch/Canal	0.113		0.113	Cutoff wall
D	2160	Tailing 100	Tailing Wetland	0.005		0.005	Cutoff wall
D	2186	WET 42	Seasonal Wetland		0.011	0.011	Cutoff wall
D	2200	Tailing 54	Tailing Wetland		0.002	0.002	Cutoff wall
D	2200 + 20	Tailing 55	Tailing Wetland		0.003	0.003	Cutoff wall
D	2230	Tailing 58	Tailing Wetland	0.013		0.013	Cutoff wall
D	2334	Tailing 98	Tailing Wetland	0.064		0.064	Fill landside pits
D	2348	Tailing 97	Tailing Wetland	0.049	0.069	0.118	Seepage berm
D Total				**0.244**	**5.84**		
Potential Impacts to Wetlands and Other Waters of the United States***				**0.432**	**7.6038**	**8.036**	

* Feature Names are from the May 1, 2013 Approved Preliminary Jurisdictional Delineation.

** Reach 13 (Sta# 844+50 to 923+75): No impacts.

*** The proposed project appears to qualify under the Nationwide Permit Program. All conditions of the NWP will be implemented to minimize and avoid water quality impacts.

DITCH 001
DITCH 002
DITCH 002
DITCH 002
DITCH 003
DITCH 004
WET 021
OPEN 020
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320+00
330+00
340+00
350+00
360+00
370+00
380+00
390+00
410+00
420+00
430+00
440+00
450+00

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Yuba City
Marysville
Linda
Olivehurst

Legend

- Construction Footprint
- Reach
- Station 202+50
- 20-foot Contours

Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 1
Contract A

0 750 1,500
Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00221_12\mapdoc\Potential_Impacts_WUS_20130502.mxd: Author: 19402: Date: 5/3/2013

DITCH 007

DITCH 006

FOREST 028

460+00 470+00 480+00 500+00 510+00 520+00 530+00 540+00 550+00 560+00 570+00 580+00 590+00 600+00 610+00 620+00 630+00 640+00 650+00 660+00 670+00 680+00 690+00 700+00 710+00 720+00

6 7 8 9 10

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South Yuba City Yuba City Marysville Linda Olivehurst

Legend

- Construction Footprint
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- Station 202+50
- 20-foot Contours

Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 2
Contract B

0 750 1,500
Feet

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860+00
870+00
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Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 3
Contract B & C

0 750 1,500
Feet

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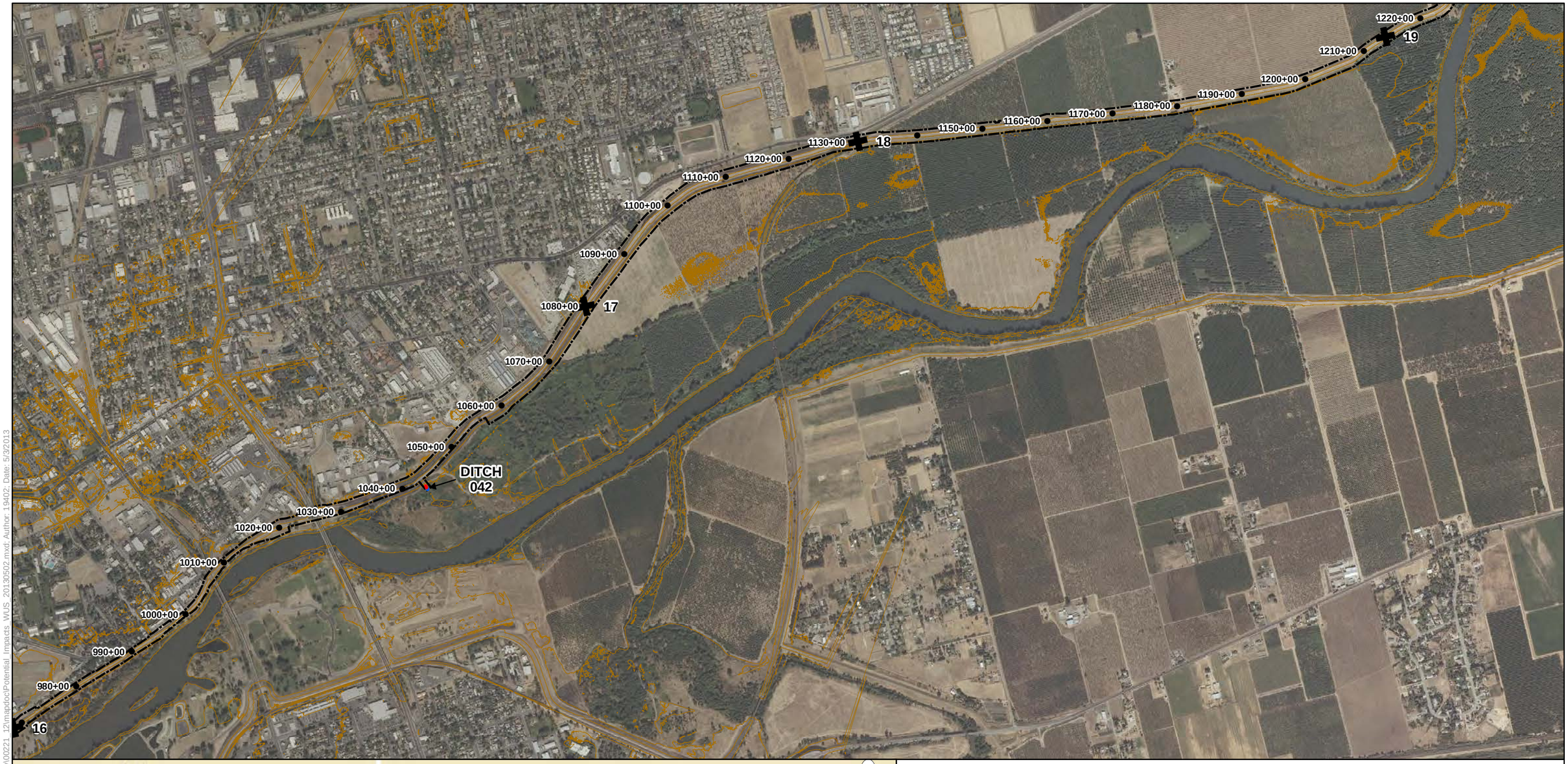

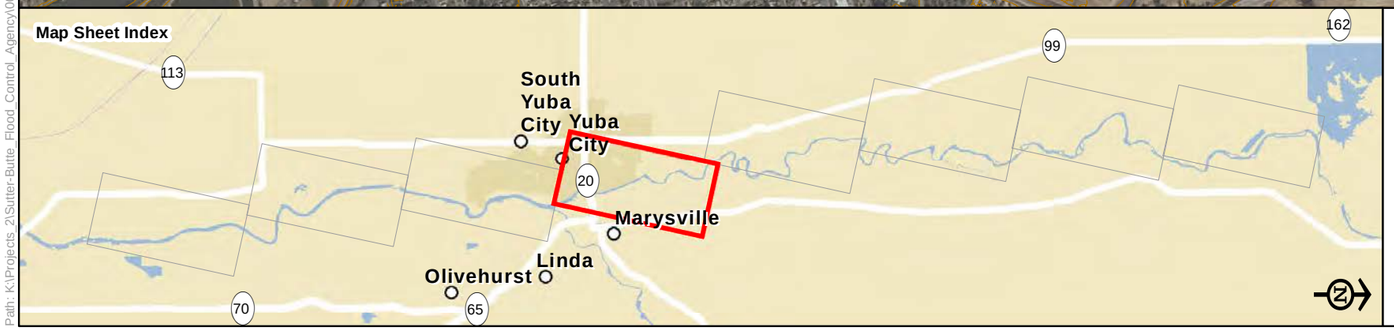

Legend

- Construction Footprint
- Reach
- Station 202+50
- 20-foot Contours

Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 4
Contract C

0 750 1,500
Feet

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DITCH 010
DITCH 009
DITCH 009
DITCH 009
FOREST 050
DITCH 125
FOREST 051
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1470+00
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1450+00
1430+00
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1400+00
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Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 5
Contract C

0 750 1,500
Feet

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Legend

- Construction Footprint
- Reach
- Station 202+50
- 20-foot Contours

Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 6
Contract C & D

0 750 1,500
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Map Sheet Index

113
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South Yuba City
Yuba City
Marysville
Linda
Olivehurst

Legend

- Construction Footprint
- Reach
- Station 202+50
- 20-foot Contours

Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 7
Contract D

0 750 1,500
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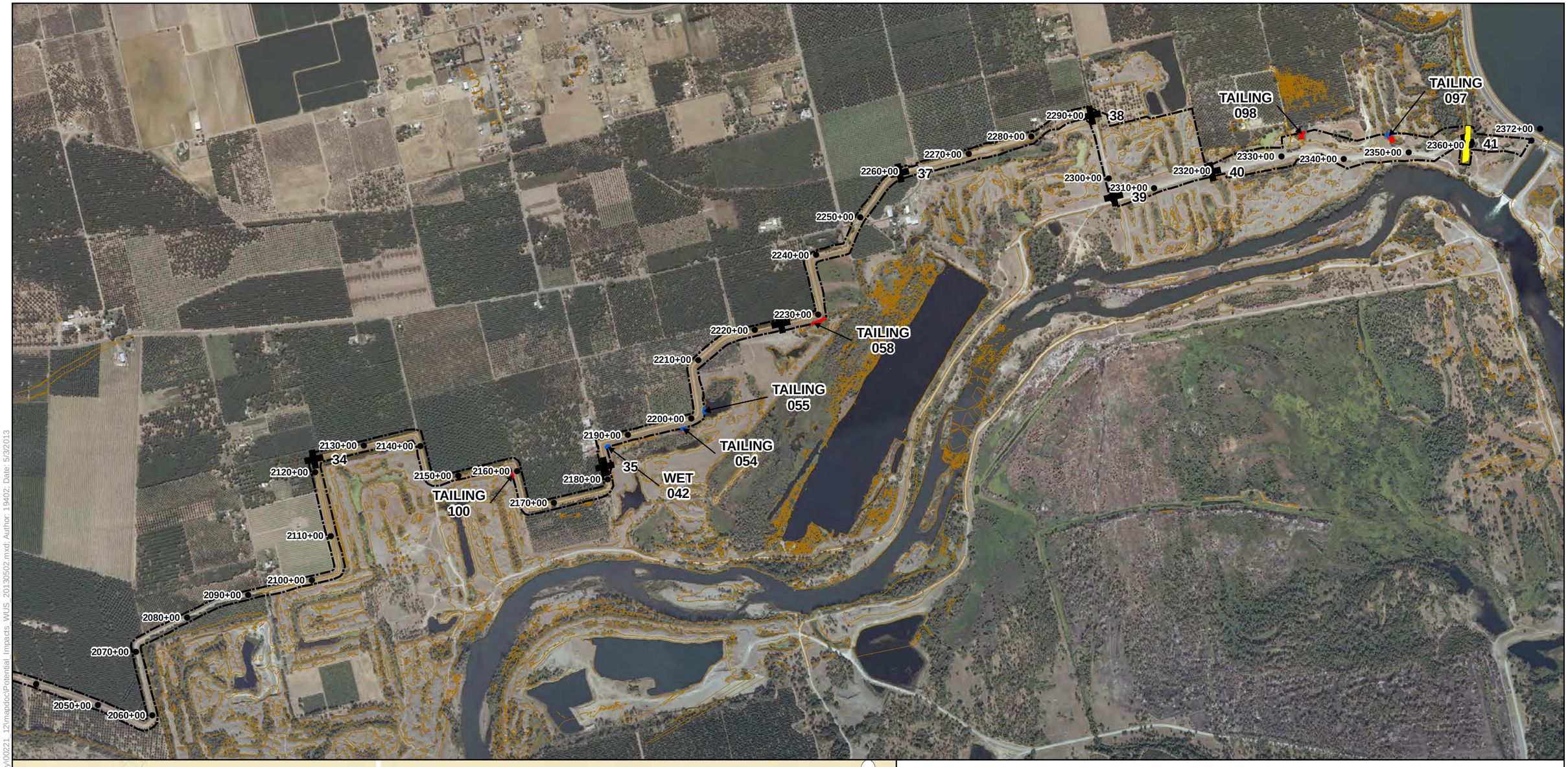

Legend

- Construction Footprint
- Reach
- Station 202+50
- 20-foot Contours

Potential Impacts to Waters of the U.S.

- Permanent
- Temporary
- No Impact (No Work Area)

Figure 3.8-1
Potential Waters of the United States

Sheet - 8
Contract D

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3.9 Wildlife

3.9.1 Introduction

This section describes the regulatory and environmental setting for wildlife; effects on wildlife that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects. Additional information on special-status wildlife is provided in Appendix F.

3.9.2 Affected Environment

This section describes the affected environment for wildlife in the biological study~~projec~~t area (defined in Section 3.9.2.2, *Environmental Setting*). The key sources of data and information used in the preparation of this section are listed below.

- A ~~California Natural Diversity Database (~~CNDDB~~)~~ query for records pertaining to the affected area, which includes portions of the following USGS 7.5-minute quadrangles that overlap the affected area: Nicolaus, Yuba City, Sutter, Olivehurst, Biggs, Gridley, and Palermo (California Department of Fish and Game 2012a).
- A USFWS list of endangered, threatened, and proposed species for the aforementioned seven USGS quadrangles (U.S. Fish and Wildlife Service 2012).
- General plans for counties and cities in the affected area.
    - Butte County General Plan 2030 (Butte County 2010).
    - Sutter County General Plan, Public Draft (Sutter County 2010).
    - City of Yuba City General Plan (City of Yuba City 2004).
    - City of Biggs General Plan 1997–2015 (City of Biggs 1998).
    - City of Gridley 2030 General Plan (City of Gridley 2010).
    - City of Live Oak 2030 General Plan (City of Live Oak 2010).
- Draft HCPs/NCCPs being prepared for the affected area.
    - Butte County Regional HCP/NCCP (in preparation; status available at www.buttehcp.com).
    - Yuba-Sutter HCP/NCCP (in preparation; status available at www.yubasutterhcp.org).
- Existing SBFCA documents:
    - Biological Survey Memo for SBFCA Preliminary Environmental Planning Support for the Feather River West Levee Rehabilitation Early Implementation Project (Gallaway Consulting 2010).
    - Draft Sutter Basin Feasibility Study Environmental Without-Project Conditions Report (ICF International 2011).
    - Lower Feather River Hydrologic Unit Code (HUC)/Honcut Creek Watershed Existing Conditions Assessment (Foothill Associates 2010).

- Sutter Basin Feasibility Study—Restoration Opportunities, Measures, and Sponsors (ICF International 2010).

3.9.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to wildlife. Additional regulatory information appears in Appendix A.

Federal

NEPA and ESA apply to wildlife but were discussed previously in Section 3.8.2.1 of *Vegetation and Wetlands* and thus not repeated here, with the exception of additional information for Section 9 of the ESA. This and other Federal policies are discussed below that relate to wildlife and apply to implementation of the proposed project.

Endangered Species Act

The Federal Endangered Species Act (ESA) protects fish and wildlife species and their habitats that have been identified by NMFS or USFWS as threatened or endangered. *Endangered* refers to species, subspecies, or distinct population segments (DPSs) that are in danger of extinction through all or a significant portion of their range. *Threatened* refers to species, subspecies, or DPSs that are likely to become endangered in the near future.

ESA is administered by USFWS and NMFS. In general, NMFS is responsible for protection of ESA-listed marine species and anadromous fish, and USFWS is responsible for other listed species. Provisions of Sections 9 and 7 of ESA are relevant to this project and are summarized below.

~~**Section 9: ESA Prohibitions**~~

~~Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species also is prohibited under Section 9, unless otherwise authorized by Federal regulations.[1] *Take*, as defined by ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harm* is defined as "any act that kills or injures the species, including significant habitat modification." In addition, Section 9 prohibits removing, digging up, cutting, and maliciously damaging or destroying federally listed plants on sites under Federal jurisdiction.~~

Section 7: ESA Authorization Process for Federal Actions

Section 7 of the ESA provides a means for authorizing take of threatened and endangered species by Federal agencies. *Take*, as defined by ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harm* is defined as "any act that kills or injures the species, including significant habitat modification." Under Section 7, the Federal agency conducting, funding, or permitting an action (the lead Federal agency, such as USACE) must consult with NMFS or USFWS, as appropriate, to ensure that the proposed project would not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed project "may affect" a listed species or designated critical habitat, the

~~[1] In some cases, exceptions may be made for threatened species under ESA Section 4(d); in such cases, USFWS or NMFS issues a "4(d) rule," describing protections for the threatened species and specifying the circumstances under which take is allowed.~~

lead agency is required to prepare a BA to evaluate the nature and severity of the expected effect. In response, NMFS or USFWS issues a BO, with a determination that the proposed project either:

- may jeopardize the continued existence of one or more listed species (*jeopardy finding*) or result in the destruction or adverse modification of critical habitat (*adverse modification finding*), or
- would not jeopardize the continued existence of any listed species (*no jeopardy finding*) or result in adverse modification of critical habitat (*no adverse modification finding*).

~~The BO issued by NMFS or USFWS may stipulate discretionary *reasonable and prudent* conservation measures. If the project would not jeopardize a listed species, USFWS or NMFS issues an incidental take statement to authorize the proposed activity~~The BO issued by NMFS or USFWS may stipulate discretionary conservation recommendations. If the project, or any reasonable and prudent alternative, would not jeopardize a listed species, USFWS or NMFS issues an incidental take statement to authorize take associated with the proposed activity or reasonable and prudent alternative. The incidental take statement will include mandatory reasonable and prudent measures designed to minimize the impacts of take associated with the project of *reasonable and prudent* alternative.

The USACE has determined that the proposed project may affect, and is likely to adversely affect the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) and the giant garter snake (*Thamnophis gigas*). A BO (08ESMF00-2013-F-0342-1) was received from USFWS on May 2, 2013 concurring with the Corps determination and that critical habitat will not be affected concluding ESA Section 7 consultation for the proposed project. See Appendix F for a copy of the USFWS BO.

Below is the list of Terms and Conditions and Conservation Measures included in the USFWS BO that will be implemented to protect the federally listed species. All Terms and Conditions and Conservation Measures are described in detail within this section unless specified in parenthesis.

Terms and Conditions

The following Terms and Conditions implement the Reasonable and Prudent Measure:

1. All the conservation measures as described in the project description, and as restated here in this biological opinion, must be fully implemented and adhered to.
2. The Corps, SBFCA, and PG&E shall include full implementation and adherence to the conservation measures as outlined in the biological opinion as a condition of any permit or contract issued for the project.
3. In order to monitor whether the amount or extent of take anticipated from implementation of the proposed project is approached or exceeded, the Corps and SBFCA shall adhere to the following reporting requirement. Should this anticipated amount or extent of incidental take be exceeded, the Corps must immediately reinitiate formal consultation as per 50 CFR 402.16.
    a. For those components of the proposed project that will result in habitat degradation or modification whereby incidental take in the form of harm or mortality is anticipated, the Corps and SBFCA will provide weekly updates to the Service with a precise accounting of the total acreage of habitat effected or number of elderberry shrubs in size of stems at ground level transplanted. Updates shall also include any information about changes in the Project Description and not analyzed in this biological opinion.

4. SBFCA shall provide photo documentation report showing pre- and post-project area conditions for giant garter snake.

Conservation Measures

SBFCA will implement the following conservation measures to avoid and minimize effects on federally listed species. To ensure their implementation, the measures listed below will be included in the project specifications.

(1)	Conservation Measure 1: Conduct Mandatory Biological Resources Awareness Training for All Project Personnel and Implement General Requirements	(VEG-MM-3)
(2)	Conservation Measure 2: Fence Elderberry Shrubs to be Protected and Monitor Fencing during Construction	
(3)	Conservation Measure 3: Conduct Beetle Surveys Prior to Elderberry Shrub Transplantation	
(4)	Conservation Measure 4: Water Down Construction Area to Control Dust	(Section 2.4.2)
(5)	Conservation Measure 5: Compensate for Direct and Indirect Effects on Valley Elderberry Longhorn Beetle Habitat	
(6)	Conservation Measure 6: Conduct Construction Activities during the Active Period for Giant Garter Snake	
(7)	Conservation Measure 7: Install and Maintain Exclusion and Construction Barrier Fencing around Suitable Giant Garter Snake Habitat	
(8)	Conservation Measure 8: Minimize Potential Impacts on Giant Garter Snake Habitat	
(9)	Conservation Measure 9: Prepare and Implement a Stormwater Pollution Prevention Plan	(Section 2.4.12)
10)	Conservation Measure 10: Prepare and Implement a Bentonite Slurry Spill Contingency Plan (Frac-Out Plan)	(Section 2.4.13)
(11)	Conservation Measure 11: Prepare and Implement a Spill Prevention, Control, and Counter-Measure Plan	(Sections 2.4.13 and 2.4.14)
(12)	Conservation Measure 12: Conduct Preconstruction Surveys and Monitoring for Giant Garter Snake	
(13)	Conservation Measure 13: Provide Escape Ramps or Cover Open Trenches at the End of Each Day	
(14)	Conservation Measure 14: Implement Additional Protective Measures during Work in Suitable Habitat during the Giant Garter Snake Dormant Period	
(15)	Conservation Measure 15: Restore Temporarily Disturbed Aquatic and Upland Habitat to Pre-Action Conditions	
(16)	Conservation Measure 16: Compensate for Permanent Loss of Aquatic Habitat for Giant Garter Snake	

Critical Habitat

Critical habitat, as defined in ESA Section 3, is:

I. the specific area within the geographic area occupied by a species, at the time it is listed in accordance with ESA, on which are found those biological features

   i. essential to the conservation of the species, and

   ii. may require special management considerations or protection; and

II. specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 9: ESA Prohibitions

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species also is prohibited under Section 9, unless otherwise authorized by Federal regulations.[2] In addition, Section 9 prohibits removing, digging up, cutting, and maliciously damaging or destroying federally listed plants on sites under Federal jurisdiction.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) protects migratory bird species from take. *Take*, under the MBTA, is defined as an action or an attempt to pursue, hunt, shoot, capture, collect, or kill (50 CFR 10.12). The definition differentiates between "intentional" take (take that is the purpose of the activity in question) and "unintentional" take (take that results from, but is not the purpose of, the activity in question).

Executive Order 13186 (signed January 10, 2001) directs each Federal agency taking actions that would have or likely would have a negative effect on migratory bird populations to work with USFWS to develop a memorandum of understanding (MOU) to promote the conservation of migratory bird populations. Protocols developed under the MOU must include the following agency responsibilities.

- Avoid and minimize, to the extent practicable, adverse effects on migratory bird resources when conducting Federal agency actions.
- Restore and enhance habitat of migratory birds, as practicable.
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The executive order is designed to assist Federal agencies in their efforts to comply with the MBTA; it does not constitute any legal authorization to take migratory birds.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act requires consultation with USFWS and the state fish and wildlife agencies where the waters of any stream or other body of water are proposed, authorized, permitted, or licensed to be impounded, diverted, or otherwise controlled or modified under a Federal permit or license. Consultation ~~is in progress~~ for the purpose of preventing loss of and

[2] In some cases, exceptions may be made for threatened species under ESA Section 4(d); in such cases, USFWS or NMFS issues a "4(d) rule," describing protections for the threatened species and specifying the circumstances under which take is allowed.

damage to wildlife resources, has been led by USFWS in coordination with NMFS and ~~DFG~~CDFW. More ~~complete text for this act is included~~information on this Act can be found in Appendix A (section A.1.8). The USFWS issued the Coordination Act Report on May 8, 2013, found in Appendix F.4. Below is the list of Coordination Act Report Recommendations.

Recommendations

If the project is constructed, the Service recommends that the Corps implement the following:

1. Mitigate the loss of any natural habitat types (riparian forest, riparian scrub shrub, oak woodland, wetland, pond, canal, stream) at a ratio of at least 2:1.
2. Should the Feasibility Study move forward the Corps should work with DWR and SBFCA to develop a variance to allow vegetation within the Corps- vegetation free zone to remain in place.
3. Work with the Service on the development of the mitigation area.
4. Lands disturbed by construction activities, including the staging areas, should be reseeded with native grasses and forbs. Reseeding should be conducted just prior to the rainy season to enhance germination and plant establishment.
5. Conduct pre-construction surveys for breeding birds including the State listed Swainson's hawk and burrowing owl.
6. Develop and implement a vegetation monitoring program as part of the project. Monitoring the riparian restoration effort should focus on (a) recording tree survival rates, (b) the quantification of improved habitat values for wildlife (primarily bird species) by measuring percent tree and shrub cover, average height of overstory trees, canopy layering, and total woody riparian vegetation, and (c) developing recommendations for alternative methods of riparian restoration should initial efforts fail. A vegetation monitoring report should be submitted annually for the first 5 years after planting activities, and on the 10th, 15th, and 20th year after planting. The monitoring reports should also identify any shortcomings in the restoration effort and include remedial actions on how to improve restoration efforts. All phases of the revegetation, and monitoring programs should be coordinated with, and approved by, the Service, CDFW, and NOAA Fisheries.
7. Comply with the Conservation Measures and Terms and Conditions in the biological opinion (Appendix A [of the Coordination Act Report, Appendix F.4]).
8. Complete the appropriate consultation with the CDFW regarding impacts to State listed species, and NOAA Fisheries, as required under section 7 of the Endangered Species Act, for potential impacts to anadromous fish under NOAA Fishery's jurisdiction.
9. SB-7 or SB-8 (depending on the alternative selected) should mitigate for the loss of upland habitat lost due to erosion protection. Effects resulting from this action should be discussed both under the FWCA as well as the federal and State endangered species acts.
10. Initiate section 7 consultation with the Service on the effects of O&M activities to federally listed species.

The following numbered bullets indicate how the USACE and SBFCA interpret the applicability of the above Coordination Act Report recommendations and the plan to implement them:

1. Compensatory mitigation will be fulfilled at the Star Bend Mitigation Area, TRLIA Feather River Floodway Corridor Restoration Project, and mitigation banks at the recommended 2:1 ratio. This is further clarified in the Mitigation and Monitoring Plan (Appendix F.4).
2. Applies to the USACE's Sutter Basin Feasibility Study; not applicable for this 408 FEIS.
3. See response 1 above.
4. SBFCA will comply with this recommendation.
5. SBFCA will comply with this recommendation.
6. See response 1 above.
7. SBFCA will comply with this recommendation.
8. The USACE has completed section 7 consultation with the NOAA Fisheries (see Section 3.10.2.1 of this FEIS) and with the USFWS (see Section 3.9.2.1). SBFCA is in consultation with CDFW for State-listed species (see Section 3.8.2.1 and below under *California Fish and Game Code*).
9. Applies to the USACE's Sutter Basin Feasibility Study; not applicable for this 408 FEIS.
10. Applies to the USACE's Sutter Basin Feasibility Study; not applicable for this 408 FEIS. O&M activities are not a part of this 408 Federal action.

State

CEQA and CESA apply to wildlife but were discussed in Section 3.8.2.1 of *Vegetation and Wetlands* and thus not repeated here. Other state policies related to wildlife that may apply to implementation of the proposed project are discussed below.

California Fish and Game Code

As discussed in Chapter 8, Section 1602 of the California Fish and Game Code requires project proponents to notify ~~DFG~~CDFW before any project diverts, obstructs, or changes the natural flow, bed, channel, or bank of any river, stream, or lake. When an existing fish or wildlife resource may be substantially adversely affected, ~~DFG~~CDFW is required to propose reasonable changes to the project to protect the resources. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

The California Fish and Game Code provides protection from take for a variety of species, referred to as fully protected species. Section 5050 lists protected amphibians and reptiles. Section 5515 prohibits take of fully protected fish species. Section 3511 prohibits take of fully protected bird species. Fully protected mammals are protected under Section 4700. The California Fish and Game Code defines *take* as "hunt, pursue, catch, capture, or kill or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research, all take of fully protected species is prohibited.

Section 3503 prohibits the killing of birds or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Many bird species could nest in the affected area or vicinity. The nests would be protected under these sections of the California Fish and Game Code.

Local

Sutter County, Butte County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley have each adopted policies related to wildlife resources, as detailed in Appendix A.

3.9.2.2 Environmental Setting

The following considerations are relevant to wildlife conditions in the proposed project area.

~~Affected Area~~Biological Study Area

The ~~affected area~~biological study area generally includes the 40+ miles of the Feather River's western levee from south of the Thermalito Afterbay to approximately 4 miles north of the Sutter Bypass. The biological study area for the proposed project consists of the most expansive construction footprint for the three FRWLP alternatives~~Along this linear area, the affected area spans the project footprint, which includes the maximum extent of all alternatives~~, plus a 100-foot buffer on either side to account for potential effects on the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB). The biological study area also includes the five potential borrow sites that have been identified and the Star Bend Mitigation Area, where impacts to VELB will be compensated.

Field Surveys

Field surveys to identify habitats for special-status (defined below) wildlife in the biological study~~affected~~ area and elderberry shrub (habitat for the VELB) surveys were conducted by ICF biologists on July 20–22, July 27, and August 31, 2011, and on October 30 and 31, 2012. An HDR biologist conducted a 2-day survey for raptor nests on May 29 and 30, 2012. An assessment of habitat for giant garter snake was conducted by ICF and HDR biologists on July 12, 2012. A reconnaissance level survey of the borrow sites was conducted on October 25, 2012. During the surveys, biologists took representative photos of the biological study~~affected~~ area and recorded all wildlife species observed. Species observed during the surveys are listed in Table 3.9-1.

Elderberry shrub surveys were conducted by ICF biologists in 2011~~ and 2012~~. Additional mapping of the elderberry shrubs was conducted by ICF concurrently with arborist surveys in summer 2012. During the 2011 surveys, biologists~~Biologists~~ located elderberry shrubs by driving and walking along the levee in the ~~affected~~ biological study area. All visible elderberry shrubs (and shrub clusters) within 100 feet of the maximum extent of the alternative boundaries were mapped with a sub-meter accurate ~~geographic~~ global positioning system (GPS) and recorded. When the bases of shrubs were accessible, stem counts, heights, and widths of shrubs were recorded, and shrubs were surveyed for VELB exit holes. Where there wasn't property access, or where dense poison oak, blackberry, and/or other vegetation surrounds elderberry shrubs, stem counts and exit hole surveys could not be conducted (all shrubs to be removed will be surveyed prior to removal as discussed in Section 3.9.4.2). ~~Impact estimates for these elderberry shrubs will be determined in consultation with USFWS. Surveys will be conducted prior to construction for shrubs located within the refined construction impact area in accordance with the Conservation Guidelines for the VELB (U.S. Fish and Wildlife Service 1999a) and as directed by USFWS.~~ Information recorded for each shrub included the number of stems with diameters between 1 and 3 inches, 3 and 5 inches, and greater than 5 inches; whether the shrub is located in riparian or nonriparian habitat; the approximate height and width of the elderberry shrub; and the presence of VELB exit holes. ~~Borrow sites recently have been~~

~~identified and have not been surveyed yet. Surveys of these sites are planned to occur in Fall/Winter 2012, and information will be added to the EIR/EIS when complete.~~

Table 3.9-1. Wildlife Species Observed in the Biological Study Area~~Affected Area~~

Common Name	Scientific Name
Amphibians	
American ~~B~~bullfrog	*Lithobates catesbeianus ~~Rana catesbeiana~~*
Reptiles	
Western pond turtle	*Emys marmorata*
Western fence lizard	*Sceloporus occidentalis*
Birds	
Acorn woodpecker	*Melanerpes formicivorus*
American coot	*Fulica americana*
American crow	*Corvus brachyrhynchos*
American goldfinch	*Carduelis tristis*
American kestrel	*Falco sparverius*
American robin	*Turdus migratorius*
American white pelican	*Pelecanus erythrorhynchos*
Bald eagle	*Haliaeetus leucocephalus*
Barn swallow	*Hirundo rustica*
Belted kingfisher	*Megaceryle alcyon*
Black phoebe	*Sayornis nigricans*
Brewer's blackbird	*Euphagus cyanocephalus*
Bushtit	*Psaltriparus minimus*
California quail	*Callipepla californica*
California towhee	*Pipilo crissalis*
Canada goose	*Branta canadensis*
Cedar waxwing	*Bombycilla cedrorum*
Cooper's hawk	*Accipiter cooperii*
Dark-eyed junco	*Junco hyemalis*
Double-crested cormorant	*Phalacrocorax auritus*
European starling	*Sturnus vulgaris*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Greater white-fronted goose	*Anser Albifrons*
Greater yellowlegs	*Tringa melanoleuca*
Great-horned owl	*Bubo virginianus*
Green heron	*Butorides virescens*
Gull sp.	*Larus* sp.
House finch	*Carpodacus mexicanus*
House wren	*Troglodytes aedon*
Killdeer	*Charadrius vociferus*
Lark sparrow	*Chondestes grammacus*

Common Name	Scientific Name
Lesser goldfinch	*Carduelis psaltria*
Mallard	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Northern flicker	*Colaptes auratus*
Northern harrier	*Circus cyaneus*
Northern mockingbird	*Mimus polyglottos*
Nuttall's woodpecker	*Picoides nuttallii*
Osprey	*Pandion haliaetus*
Pied-billed grebe	*Podilymbus podiceps*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Rock dove	*Columba livia*
Ruby-crowned kinglet	*Regulus calendula*
Snowy egret	*Egretta thula*
Spotted towhee	*Pipilo erythrophthalmus*
Swainson's hawk	*Buteo swainsoni*
Turkey vulture	*Cathartes aura*
Western bluebird	*Sialia mexicana*
Western kingbird	*Tyrannus verticalis*
Western meadow-lark	*Sturnella neglecta*
Western scrub jay	*Aphelocoma californica*
White-crowned sparrow	*Zonotrichia leucophrys*
Wild turkey	*Meleagris gallopavo*
Yellow-billed magpie	*Pica nuttalli*
Yellow-rumped warbler	*Dendroica coronata*
Mammals	
Black-tailed deer	*Odocoileus hemionus columbianus*
Black-tailed jack rabbit	*Lepus californicus*
Bobcat	*Lynx rufus*
California ground squirrel	*Otospermophilus beecheyi*
Coyote	*Canis latrans*
Desert cottontail	*Sylvilagus audubonii*
Northern river otter	*Lontra canadensis*

Wildlife Habitat—Land Cover Type Associations

This section describes the locations of land cover types identified in the biological study affected area and the relationship between land cover types and the wildlife habitats and the species they support. There are eight14 land cover types in the biological studyaffected area, as described in Section 3.8, *Vegetation and Wetlands*, and shown in Plates 3.8-1 and 3.8-2. These land cover types are riparian forests, riparian scrub-shrub, oak woodlands, forested/shrub wetlands, seasonal wetlands, tailings wetlands, open water, streams and rivers, canals and ditches, ponds and basins,

orchards, field and row crops, developed, and ruderal areas. Table 3.8-1 in Section 3.8, *Vegetation and Wetlands*, lists the approximate acreages ~~and percentages~~ of the land cover types in the biological study~~affected~~ area. Wildlife habitats associated with land cover types in the biological study~~affected~~ area are discussed below. ~~Land cover types of borrow sites are not included below because they have not been surveyed yet.~~

Riparian Forest

~~In the affected area, riparian forest is located primarily along the water side of the levee in association with the Feather River and its tributaries but also is located along the fringes of ponds and canals.~~Riparian forest occurs on both sides of the levee, with the largest concentration occurring on the waterside along the Feather River. Riparian forest also forms a fringe around some of the tailing wetlands. Riparian forest communities provide wildlife with dispersal and migration corridors, foraging areas, cover, and breeding habitat. Many species of birds, mammals, reptiles, and amphibians are known to use riparian communities and other woody vegetation communities located in proximity to watercourses. Riparian trees provide suitable nesting and roosting habitat for a variety of raptors, egrets, herons, songbirds, and bats. Birds known to nest in these communities include red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), Cooper's hawk (*Accipiter cooperii*), American kestrel (*Falco sparverius*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), Nuttall's woodpecker (*Picoides nuttallii*), western scrub jay (*Aphelocoma californica*), western yellow-billed cuckoo (*Coccyzus americanus*), California towhee (*Pipilo crissalis*), spotted towhee (*Pipilo maculates*), black phoebe (*Sayornis nigricans*), warbling vireo (*Vireo gilvus*), yellow-rumped warbler (*Dendroica coronata*), wrentit (*Chamaea fasciata*), and house wren (*Troglodytes aedon*). Riparian forest also provides foraging habitat for numerous species of migratory and wintering birds.

Bat species known to use riparian habitats for roosting include California myotis (*Myotis californicus*), Yuma myotis (*Myotis yumanensis*), hoary bat (*Lasiurus cinereus*), western mastiff bat (*Eumops perotis californicus*), western red bat (*Lasiurus blossevillii*), and pallid bat (*Antrozous pallidus*). Other mammal species known to use riparian forest include beaver (*Castor canadensis*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), black-tailed deer (*Odocoileus hemionus columbianus*), raccoon (*Procyon lotor*), and muskrat (*Ondatra zibethicus*). Reptiles, including common garter snake (*Thamnophis sirtalis*), western fence lizard (*Sceloporus occidentalis*), and western pond turtle (*Emys marmorata*), and amphibians, including ~~Pacific~~Sierran tree frog (*Pseudacris sierra*~~*Hyla regilla*~~), western toad (*Bufo boreas*), and bullfrog (*Lithobates catesbeianus*~~*Rana catesbeiana*~~), also are associated with this land cover type. Additionally, the VELB has potential to occur at elderberry shrubs that have stems 1 inch or greater in diameter.

Riparian Scrub-Shrub

Similar to riparian forest, riparian scrub-shrub in the biological study area~~affected area~~ is located primarily along the water side of the levee in association with the Feather River and its tributaries, and along the fringes of ponds and some canals.

Because of its association with and/or proximity to riparian forest, wildlife use of riparian scrub-shrub is similar to riparian forest. However, because the vegetation in areas of scrub-shrub lack large, mature trees of riparian forests, smaller birds are more likely to use these areas for nesting. Many of the wildlife species listed above as occurring in riparian forest would occur in riparian scrub-shrub.

Oak Woodland

The biological study area contains several small patches of oak woodland. ~~In the affected area, oak woodland occurs as scattered patches south of Almond, Laurel, and Sacramento Avenues~~. These areas provide nesting habitat for a variety of raptors and other migratory tree-nesting birds discussed under the riparian section above. Additionally, great-horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), and yellow-billed magpie (*Pica nuttalli*) are known to use these habitats. Reptiles and mammals that occur in riparian woodland also may use oak woodlands for foraging and cover habitat. Because of the small, scattered nature of these areas, the diversity of species using these areas is expected to be much lower than ~~that~~ in riparian areas in the study area.

Forested/Shrub Wetlands

Forested/shrub wetlands occur along the margins of the Feather River and tributaries to the Feather River and are concentrated in the southern half of the biological study area. Some of the wildlife species associated with riparian forest, as described above, or seasonal wetland, as described below, would occur in forested/shrub wetlands.

Seasonal Wetlands

Seasonal wetlands are scattered throughout the southern half of the biological study area. Many of the seasonal wetlands are associated with riparian forest. Therefore, wildlife species associated with riparian forest, as described above, would also occur in seasonal wetlands.

Open Water

Open water in the biological study area consists of areas where water is flowing or standing above ground and vegetation is either non-emergent, sparse, or absent. ~~Open water in the biological study area consists of the open areas of water in the Feather River and ponds. habitats in the affected area include the river, ponds, and canals. Small ditches that provide open water habitat for wildlife are also present in the affected area. Smaller agricultural canals associated with rice and other flooded crops are discussed under the agricultural lands discussion below.~~

~~In addition to providing habitat for fish (discussed in Section 3.10, *Fisheries and Aquatic Resources*), open water provides foraging, cover, and reproductive sites for a variety of wildlife species.~~ Open water areas provide essential foraging habitat for a variety of birds, including ~~wading birds such as great blue heron, great egret, and snowy egret (*Egretta thula*);~~ waterfowl such as northern shoveler (*Anas clypeata*), northern pintail (*Anas acuta*), common goldeneye (*Bucephala clangula*), mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), ruddy duck (*Oxyura jamaicensis*), gadwall (*Anas strepera*), and cinnamon teal (*Anas cyanoptera*); other water birds such as eared grebe (*Podiceps nigricollis*), double-crested cormorant (*Phalacrocorax auritus*), and American white pelicans (*Pelecanus erythrorhynchos*); and land birds such as bald eagle (*Haliaeetus leucocephalus*), bank swallow (*Riparia riparia*), and belted kingfisher (*Megaceryle alcyon*).

Reptiles and amphibians, including western pond turtle, common garter snake, western aquatic garter snakes ~~(*Thamnophis couchii*)~~, ~~Pacific~~Sierran tree frog, western toad, and bullfrog, use open water areas for breeding, foraging, and cover. ~~Canals and ditches that contain water through mid-fall, have suitable prey, and adequate cover and foraging habitat have the potential to support giant garter snake (*Thamnophis gigas*).~~

Mammals that use open water habitats for foraging include bats such as California myotis, Yuma myotis, hoary bat, and western red bat, that forage for insects over open water. Additionally, terrestrial mammals such as black-tailed deer, raccoon, striped skunk, and Virginia opossum use open water habitats as water sources. Aquatic and semi-aquatic mammals that occur in open water habitats include beaver, river otter (*Lutra canadensis*), mink (*Mustela vison*), and muskrat.

Ponds and Basins

Ponds and basins in the biological study area consist of artificial and excavated depressions, some of which contain water year-round. Wildlife species that would occur in ponds and basins would be similar to those described above for open water.

Tailings~~s~~ Wetlands

Tailing wetlands are concentrated in the northern portion of the biological study area. Wildlife use of tailing wetlands would be similar to open water as discussed above.

Streams and River

The Feather River and two unnamed streams are located in the biological study area. In addition to providing habitat for fish (discussed in Section 3.10, *Fisheries and Aquatic Resources*), the Feather River provides foraging, cover, and reproductive sites for a variety of wildlife species, as described above under Open Water.

Streams with well-vegetated areas provide food, water, and migration and dispersal corridors, as well as escape, nesting, and thermal cover for many wildlife species (Mayer and Laudenslayer 1988). Wildlife species associated with stream and riparian habitats include Sierran treefrog, California newt (*Taricha torosa*), Anna's hummingbird (*Calypte anna*), black phoebe, raccoon, and striped skunk (Zeiner et al. 1988, 1990a, 1990b).

Canals and Ditches

Wildlife use of canals and ditches is dependent on several factors including the extent of vegetation within and along the canal or ditch, whether or not the canal or ditch is concrete lined, the period of time that water remains within the canal or ditch, and the velocity of flow. Concrete-lined canals or ditches or those with high flow velocities typically have low value for wildlife, although large canals or ditches with slower flows can be used by waterfowl. Canals and d~~D~~itches with vegetation within and along the banks and adequate duration of water can provide food, water, cover, and dispersal corridors for various wildlife species, such as Sierran treefrog, California newt, great egret, raccoon, and striped skunk. Banks of canals and ditches could be used by California ground squirrel (*Spermophilus beecheyi*) and western fence lizard (*Sceloporus occidentalis*). Canals and ditches that contain water through mid-fall, have suitable prey, and adequate cover and foraging habitat have the potential to support giant garter snake (*Thamnophis gigas*).

Orchard

Orchard is the dominant land cover type and is present throughout much of the biological study area~~affected area~~. Orchards have limited value for wildlife, although birds such as red-shouldered hawk, American crow (*Corvus brachyrhynchos*), yellow-billed magpie, mourning dove (*Zenaida macroura*), European starling (*Sturnus vulgaris*), and rock pigeon (*Columba livia*) may nest or forage in these areas.

Field and Row Crops

Row and field crops are located primarily in the southern portion of the biological study area~~affected area~~. Row and field crops provide foraging opportunities for a variety of raptors, including red-tailed hawk, Swainson's hawk, white-tailed kite, American kestrel, western burrowing owl (*Athene cunicularia hypugaea*), northern harrier (*Circus cyaneus*), great-horned owl, barn owl, and other migratory and resident birds such as sandhill crane (*Grus canadensis tabida*), Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird ~~(*Agelaius phoeniceus*)~~, tricolored blackbird (*Agelaius tricolor*), American crow, yellow-billed magpie, western meadowlark (*Sturnella neglecta*), mourning dove, and rock pigeon. Similar species are known to use irrigated pastures for foraging, and birds such as burrowing owl, northern harrier, and western meadowlark are known to nest in these areas.

~~Wet Agriculture~~

~~Wet agriculture (rice) occurs only at the proposed Nevis borrow site. Flooded cropland (such as rice) serve as freshwater wetlands that provide suitable habitat for shorebirds such as and black-necked stilt (*Himantopus mexicanus*) and long-billed dowitcher (*Limnodromus scolopaceus*), and wading birds such as greater yellowlegs (*Tringa melanoleuca*), white-faced ibis (*Plegadis chihi*), great blue heron, great egret, and snowy egret (*Egretta thula*) (Zeiner et al. 1990a: 32, 34, 36, 44, 198, 202, 240). Rice fields provide habitat for and are used extensively by giant garter snakes. The spring and fall flooding and fall drying of rice fields coincides fairly closely with the biological requirements of the snake. (U.S. Fish and Wildlife Service 1999a.)~~

Developed Lands

Developed areas in the biological study area~~affected area~~ include urban areas (residential and commercial development), ranchettes, rural neighborhoods, agricultural outbuildings, farm equipment storage areas, pumping stations, and a plant nursery.

These areas provide limited habitat for wildlife but are often known to support common "urban-dwelling species" such as northern mockingbird (*Mimus polyglottos*), rock pigeon, mourning dove, house sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), western scrub jay, Botta's pocket gopher (*Thomomys bottae*), California ground squirrel ~~(*Spermophilus beecheyi*)~~, house mouse (*Mus musculus*), black rat (*Rattus rattus*), and coyote (*Canis latrans*). Semi-developed areas containing grass, trees, or water sources (small ponds and ditches) may support additional wildlife species.

Ruderal

Ruderal areas in the biological study area~~affected area~~ include the levee slopes and disturbed areas adjacent to levee slopes. Various native and nonnative scattered trees, shrubs, grasses, and forbs are found in these areas as described in the vegetation and wetlands section. Similar to developed lands, these areas support mostly common wildlife species, although scattered elderberry shrubs, which may support VELB, were found in these areas.

Special-Status Wildlife Species

Special-status wildlife species are defined as animals that are legally protected under the ESA, CESA, or other regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status species are defined as follows.

- Species that are listed or proposed for listing as threatened or endangered under the ESA (50 CFR 17.11 for listed animals and various notices in the ~~Federal Register (~~FR~~)~~ for proposed species).
- Species that are candidates for possible future listing as threatened or endangered under the ESA (7~~3~~ FR 6999~~375178~~, November 21~~December 10~~, 201~~208~~).
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 CCR 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380).
- Animals listed as California species of special concern on ~~DFG~~CDFW's Special Animals List (California Department of Fish and Game 2011).
- Animals that are fully protected in California under the California Fish and Game Code (Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).
- Bats identified as medium or high priority on the Western Bat Working Group regional priority species matrix (Western Bat Working Group 2007).

Based on the USFWS (2012) species list and CNDDB (California Department of Fish and Game 2012) records search for the quadrangles overlapping the biological study~~affected~~ area (included above in Section 3.9.2), 23 special-status wildlife species were identified as having potential to occur in the biological study~~affected~~ area. Of these 23 species, four are known to occur in the biological study~~affected~~ area (western pond turtle, Swainson's hawk, western yellow-billed cuckoo, and bank swallow). Swainson's hawk was observed in the biological study~~affected~~ area during 2011 field surveys. Western pond turtle was observed immediately adjacent to the biological study area in October 2012 and bald eagle was observed near the biological study area in May 2012.

Though not reported to occur in the biological study~~affected~~ area, 10 of the 23~~other~~ special-status wildlife species identified have a moderate or high potential to occur in the biological study~~affected~~ area given their known range, reports of occurrence, and/or the presence of suitable habitat. These species include Antioch Dunes anthicid beetle (*Anthicus antiochensis*), Sacramento anthicid beetle (*A. sacramento*), Sacramento Valley tiger beetle (*Cicindela hirticollis abrupta*), VELB, giant garter snake, northern harrier, bald eagle, western burrowing owl, tricolored blackbird, and silver-haired bat. The remaining nine species have low or no potential to occur. ~~Seven~~Eight additional species were added as having at least a moderate potential to occur in the affected area based on species habitat requirements and professional judgment (white-tailed kite, loggerhead shrike, purple martin, yellow warbler, pallid bat, hoary bat, ~~and~~ western red bat, and ringtail [*Bassariscus astutus*]). All wildlife species considered are listed in Table 3.9-2, which contains their regulatory status, distribution, habitat requirements, and a rationale for their potential to occur in the biological study~~affected~~ area. The 2~~1~~2~~1~~ special-status wildlife species that are known to occur or have a high or moderate potential to occur in the biological study~~affected~~ area are discussed briefly below.

Table 3.9-2. Rare and Special-Status Wildlife Species Identified As Having Potential to Occur in FRWLP Biological Study~~Affected~~ Area

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Invertebrates				
Antioch Dunes anthicid beetle *Anthicus antiochensis*	–/–/–	Population in Antioch Dunes believed extinct. Present in several localities along the Sacramento and Feather Rivers.	Loose sand on sand bars and sand dunes.	Moderate—small amount of potentially suitable habitat ~~may be~~ present ~~in the affected area~~; known locations within 2 miles south of the study~~affected~~ area.
Sacramento anthicid beetle *Anthicus sacramento*	–/–/–	Dune areas at mouth of Sacramento River; western tip of Grand Island, Sacramento County; upper Putah Creek and dunes near Rio Vista, Solano County; Ord Ferry Bridge, Butte County.	Found in sand slip-faces among willows; associated with riparian and other aquatic habitats.	Moderate—small amount of potentially suitable habitat ~~may be~~ present ~~in the affected area~~; known locations within 2 miles south of the study~~affected~~ area.
Sacramento Valley tiger beetle *Cicindela hirticollis abrupta*	–/–/–	Lower Sacramento Valley (i.e., Sacramento River, lower American River, and Cache Creek).	Found in sandy areas among willows in riverine and riparian habitats.	Moderate—small amount of potentially suitable habitat ~~may be~~ present ~~in the affected area~~; known locations within 2 miles south of the study~~affected~~ area.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/–/–	Streamside habitats below 3,000 feet throughout the Central Valley.	Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.	High—suitable habitat present; species occurrences near the ~~in affected~~study area.
Conservancy fairy shrimp *Branchinecta conservatio*	E/–/–	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties.	Large, deep vernal pools in annual grasslands.	None—no suitable habitat present ~~in affected area~~.
Vernal pool fairy shrimp *Branchinecta lynchi*	T/–/–	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County.	Common in vernal pools; also found in sandstone rock outcrop pools.	None—no suitable habitat present ~~in affected area~~.
Vernal pool tadpole shrimp *Lepidurus packardi*	E/–/–	Shasta County south to Merced County.	Vernal pools and ephemeral stock ponds.	None—no suitable habitat present ~~in affected area~~.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Amphibians				
California tiger salamander *Ambystoma californiense*	T/T/–	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County.	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.	Low—limited suitable aquatic habitat and unsuitable surrounding upland habitat; no occurrences within 5 miles of the study~~in affected~~ area.
California red-legged frog *Rana draytonii*	T/SSC/–	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County.	Permanent and semi-permanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation. May estivate in rodent burrows or cracks during dry periods.	None—considered extirpated from the valley floor (U.S. Fish and Wildlife Service 2002).
Western spadefoot *Spea hammondii*	–/SSC/–	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California.	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands.	Low—limited suitable aquatic habitat and unsuitable surrounding upland habitat; no occurrences within 5 miles of the study~~in affected~~ area.
Reptiles				
Western pond turtle *Emys marmorata*	–/SSC/–	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada.	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests.	High—suitable habitat present; observed immediately adjacent to the study area; one occurrence in the study~~affected~~ area.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Giant garter snake *Thamnophis gigas*	T/T/–	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno.	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	Moderate—suitable habitat present; no occurrences in study~~affected~~ area but numerous occurrences within 5 miles of the study~~affected~~ area, some of which are in water bodies ~~potentially~~ connected to canals and ditches in the study~~affected~~ area.
Birds				
Greater sandhill crane *Grus canadensis tabida*	–/T/–	Breeds in Siskiyou, Modoc, Lassen, Plumas, and Sierra Counties. Winters in the Central Valley, southern Imperial County, Lake Havasu National Wildlife Refuge, and the Colorado River Indian Reserve.	Summers in open terrain near shallow lakes or freshwater marshes. Winters in plains and valleys near bodies of fresh water.	Low—limited suitable wintering habitat; one occurrence within 5 miles of the study~~affected~~ area.
Swainson's hawk *Buteo swainsoni*	–/T/–	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County.	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields.	High—suitable nesting and foraging habitat; observed in the study area; seven records in and immediately adjacent to the study~~affected~~ area.
Northern harrier *Circus cyaneus*	–/SSC/–	Occurs throughout lowland California. Has been recorded in fall at high elevations.	Nests and forages in grasslands, meadows, marshes, and seasonal and agricultural wetlands.	Moderate—suitable foraging habitat, limited suitable nesting habitat; one occurrence within 5 miles of the study~~affected~~ area.
White-tailed kite *Elanus leucurus*	–/FP/–	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border.	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Moderate—suitable nesting and foraging habitat; one~~no~~ occurrence~~s~~ within 5-miles of the ~~affected~~study area.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Bald eagle *Haliaeetus leucocephalus*	–/E, FP/–	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County.	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean.	High—suitable nesting and foraging habitat along Feather River; one occurrence and observed within 0.5 mile of the ~~affected~~study area.
California black rail *Laterallus jamaicensis coturniculus*	–/T/–	Permanent resident in the San Francisco Bay and eastward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties.	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations.	Low—very limited amounts of suitable nesting substrate ~~wetlands~~ in the study area~~no suitable nesting and foraging habitat~~; no occurrences within 5 miles of the affected area.
Western yellow-billed cuckoo *Coccyzus americanus*	C/E/–	Nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers.	Wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley-oak riparian habitats where scrub jays are abundant.	High—suitable nesting and foraging habitat; two occurrences in the study~~affected~~ area.
Western burrowing owl *Athene cunicularia hypugea*	–/SSC/–	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast.	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows.	Moderate—suitable foraging habitat; limited suitable nesting habitat; no occurrences in the study~~affected~~ area.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Loggerhead shrike *Lanius ludovicianus*	–/SSC/–	Resident and winter visitor in lowlands and foothills throughout California. Rare on coastal slope north of Mendocino County, occurring only in winter.	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Moderate—suitable nesting and foraging habitat; no occurrences in the study~~affected~~ area.
Purple martin *Progne subis*	–/SSC/–	Coastal mountains south to San Luis Obispo County, west slope of the Sierra Nevada, and northern Sierra and Cascade ranges. Absent from the Central Valley except in Sacramento. Isolated, local populations in southern California.	Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats. Also nests in vertical drainage holes under elevated freeways and highway bridges.	Moderate—suitable nesting and foraging habitat; no occurrences in the study~~affected~~ area.
Bank swallow *Riparia riparia*	–/T/–	Occurs along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American Rivers, in the Owens Valley, and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou Counties. Small populations near the coast from San Francisco County to Monterey County.	Nests in bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam.	High—~~suitable foraging habitat present;~~ suitable nesting habitat adjacent to the study area~~may be present but unlikely~~; eight occurrences ~~within and~~ adjacent to the study~~affected~~ area.
Yellow warbler *Dendroica petechia*	–/SSC/–	Nests over all of California except the Central Valley, the Mojave Desert region, and high altitudes in the Sierra Nevada. Winters along the Colorado River and in parts of Imperial and Riverside Counties.	Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; also may use oaks, conifers, and urban areas near stream courses.	Moderate—suitable nesting and foraging habitat; no occurrences in the study~~affected~~ area.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Tricolored blackbird *Agelaius tricolor*	–/SSC/–	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	Moderate—suitable ~~nesting and~~ foraging habitat present; limited amount of suitable nesting habitat present; no occurrences in the study~~affected~~ area.
Mammals				
Western red bat *Lasiurus blossevillii*	–/SSC/ WBWG: High priority	Scattered throughout much of California at lower elevations.	Found primarily in riparian and wooded habitats. Occurs at least seasonally in urban areas. Day roosts in trees in the foliage. Found in fruit orchards and sycamore riparian habitats in the Central Valley.	Moderate—suitable roosting and foraging habitat; no occurrences within 5 miles of the study~~affected~~ area (probably because of the lack of bat surveys in ~~the affected~~ this area).
Hoary bat *Lasiurus cinereus*	–/–/ WBWG: Moderate priority	Occurs throughout California from sea level to 13,200 feet.	Found primarily in forested habitats. Also found in riparian areas and in park and garden settings in urban areas. Day roosts in foliage of trees.	Moderate—suitable roosting and foraging habitat; no occurrences have been recorded within 5 miles of the study~~affected~~ area (probably due to the lack of bat surveys in ~~the~~this ~~affected~~ area).
Silver-haired bat *Lasionycteris noctivagans*	–/–/WBWG: Moderate priority	Found from the Oregon border south along the coast to San Francisco Bay and along the Sierra Nevada and Great Basin region to Inyo County. Also occurs in southern California from Ventura and San Bernardino Counties south to Mexico. Has been recorded in Sacramento, Stanislaus, Monterey, and Yolo Counties.	During spring and fall migrations, may be found anywhere in California. Summer habitats include coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.	Moderate—suitable roosting and foraging habitat; two occurrences within 5 miles of the study~~affected~~ area.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area
Pallid bat *Antrozous pallidus*	–/SSC/ WBWG: High priority	Occurs throughout California, except the high Sierra, from Shasta to Kern County and the northwest coast, primarily at lower and mid elevations.	Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts.	Moderate—suitable roosting and foraging habitat; no occurrences have been recorded within 5 miles of the study~~affected~~ area (~~probably~~possibly due to the lack of bat surveys in ~~the~~this ~~affected~~ area).
Western mastiff bat *Eumops perotis californicus*	–/SSC/ WBWG: High priority	Occurs along the western Sierra primarily at low to mid-elevations and widely distributed throughout the southern coast ranges. Recent surveys have detected the species north to the Oregon border.	Found in a wide variety of habitats from desert scrub to montane conifer. Roosts and breeds in deep, narrow rock crevices, but also may use crevices in trees, buildings, and tunnels.	Low— uncommon in the Central Valley and roost sites primarily associated with crevices in cliff faces and boulders. No occurrences within 5 miles of the study~~affected~~ area.
Ringtail *Bassariscus astutus*	–/FP/–	Found throughout most of California except for the San Joaquin Valley and portions of southern deserts.		High—known to occur along the Feather River within the study area (Wyatt pers. comm.)

[a] Status explanations:

Federal

E = listed as endangered under the Federal Endangered Species Act.

T = listed as threatened under the Federal Endangered Species Act.

C = candidate species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded.

– = no listing.

State

E = listed as endangered under the California Endangered Species Act.

T = listed as threatened under the California Endangered Species Act.

FP = fully protected under the California Fish and Game Code.

SSC = species of special concern in California.

Common and Scientific Names	Status[a] Federal/ State/Other	Geographic Distribution	Habitat Requirements	Potential Occurrence in Biological Study~~Affected~~ Area

– = no listing.

Other

WBWG = Western Bat Working Group 2007. Available: <http://www.wbwg.org/spp_matrix.html>.

Moderate priority = species status is unclear because of a lack of data; this designation indicates a level of concern that should warrant (1) closer evaluation and more research of the species and possible threats and (2) conservation actions benefiting the species.

High priority = species are imperiled or at high risk of imperilment.

Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetles

The Antioch Dunes anthicid beetle, Sacramento anthicid beetle, and Sacramento Valley tiger beetle are associated with sand dunes/bars and other sandy areas in riparian areas. The Antioch Dunes anthicid beetle actively scavenges on dead insects at night, burrowing into the sand and remaining inactive during the day. Sacramento anthicid beetles also scavenge dead insects. Adults of both species overwinter and emerge in the spring to lay eggs from which the larvae hatch, and the next generation of adults emerges in summer. Adults of Antioch Dunes and Sacramento anthicids are most commonly collected in June–July and June–August, respectively (California Department of Fish and Game 2012b).

There are CNDDB records from 1987 for occurrences of each anthicid beetle approximately 2 miles south of the southern extent of the biological studyproject area. There are two CNDDB records from 1970 and 1984 for occurrences of Sacramento Valley tiger beetle 1–2 miles south of the southern extent of the studyaffected area. No Sacramento Valley tiger beetles were found during intensive surveys in sandy areas in the floodplain of the Sacramento Valley during the period 2001–2004. This beetle may possibly be extirpated from the areas south of the studyaffected area (California Department of Fish and Game 2012b). A small amount of potentially suitable Suitable habitat for the three beetle species ismay be present near the end of Reach 8 in the biological study areain sandy riparian areas in the affected area.

Valley Elderberry Longhorn Beetle

VELB is found only in association with its host plant, elderberry, which is commonly found in riparian forests and adjacent uplands in the Central Valley and foothills (U.S. Fish and Wildlife Service 1999ba). Elderberries often grow vegetatively from rhizomes, resulting in shrubs that frequently have common root systems with multiple main stems (Talley et al. 2006) and multiple root crowns. Adult VELBs feed on elderberry foliage and are present from March through early June, during which time the adults mate. Females lay their eggs in bark crevices or at the junction of stem/trunk or leaf petiole/stem. After hatching, the larva burrows into the stem to feed and develop into pupa and adult. After transforming into an adult, it chews an exit hole and emerges. The life cycle of VELB ranges from 1 to 2 years (Barr 1991:4–5).

The closest VELB occurrence in the CNDDB (California Department of Fish and Game 2012a) is approximately 0.5 mile from the biological studyaffected area. Numerous other occurrences are located within 10 miles of the studyaffected area. Suitable habitat for the beetle is located at numerous locationsplaces in the studyaffected area. A total ofApproximately 190266 shrubs/shrub clusters are located in the biological study area, including one shrub at the Oroville Wildlife Dredge Tailings borrow sitewere mapped in the affected area (Plate 3.9-1). Because of the high density of California grape (*Vitis californica*) and Himalayan blackberry (*Rubus armeniacus*) along portions of the Feather River riparian corridor, or lack of property access, many of the elderberry shrubs within the study area could not be surveyed for VELB exit holes. Stem counts and exit hole surveys were conducted at 73 elderberry shrubs/clusters. VELB exit holes were observed at three of these shrubs.the stems of 79 shrubs/shrub clusters could not be observed and stem counts (and exit hole inspections) of these shrubs could not be conducted. Another 13 shrubs that are outside of but within 100 feet of the maximum extent of the alternative boundaries were mapped, but stem counts/exit hole inspections could not be conducted because of a lack of property access.

Western Pond Turtle

Aquatic habitats used by western pond turtles include ponds, lakes, marshes, rivers, streams, and irrigation ditches with a muddy or rocky bottom in grassland, woodland, and open forest areas (Stebbins 2003:250). Western pond turtles spend a considerable amount of time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris (Jennings et al. 1992:11). Western pond turtles move to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994:98). Turtles have been observed overwintering several hundred meters from aquatic habitat. In the southern portion of the range and along the central coast, western pond turtles are active year-round. In the remainder of their range, these turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992:11).

Eight to ten western pond turtles were observed immediately adjacent to the biological study area in Reach 4 on October 30, 2012. There is one record of an occurrence of western pond turtle at the south end of the studyaffected area. There are no additional records of occurrences within 5 miles of the study affected area (California Department of Fish and Game 2012a). Irrigation and drainage Canals and ditches, and ponds, streams and rivers, open water, and forested/shrub wetlands in and adjacent to the studyaffected area provide suitable aquatic habitat for western pond turtle. Riparian forest and some ruderal habitat adjacent to aquatic habitat provide suitable hibernacula and nesting habitat.

Giant Garter Snake

Giant garter snakes inhabit agricultural wetlands and other waterways, including irrigation and drainage canals, ricelands, marshes, sloughs, ponds, small lakes, and low-gradient streams, as well as adjacent upland areas. They do not occur in larger rivers and wetlands with sand, gravel, or rock substrates. Giant garter snake requires permanent water during its active season (early spring through mid-fall) to maintain dense populations of food organisms. The snake also requires herbaceous, emergent vegetation for protective cover and foraging habitat and open areas and grassy banks for basking. In addition, higher elevation upland habitats for cover and refuge from floodwaters are needed during the winter when the snake is inactive. Riparian woodland generally is considered unsuitable habitat because of the lack of basking sites, excessive shade, and lack of prey. Giant garter snakes begin to search for mates soon after emergence from overwintering sites. The breeding season extends from March through May and resumes briefly in September (U.S. Fish and Wildlife Service 1999ab:12, 13, 22).

There are no records of occurrences of giant garter snake in the biological studyaffected area; however, there are 20 records of occurrences within 5 miles of the affectedstudy area. The information for some of these records is suppressed, but the closest available occurrence is approximately 2 miles from the studyaffected area (California Department of Fish and Game 2012a).

Potentially suitableSuitable aquatic habitat in the biological studyaffected area consists primarily of irrigation and drainage canals and ditches. Ponds, and some seasonal wetlands, in the studyaffected area may provide suitable aquatic habitat, but most of these areas do not have connectivity to other water features except the Feather River (which is not considered suitable habitat), and therefore are less likely to support giant garter snake. A ditch along the City of Live Oak Detention Basin borrow site provides suitable aquatic habitat for giant garter snake. There is limited suitable upland habitat (some ruderal areas) in the studyaffected area and adjacent to the studyaffected area. Consequently, giant garter snakes (if present) are expected primarily to be associated with aquatic features.

Swainson's Hawk

Swainson's hawks forage in grasslands, grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Vineyards, orchards, rice, and cotton crops are generally unsuitable for foraging because of the density of the vegetation (California Department of Fish and Game 1992:41). The majority of Swainson's hawks winter in South America, although some winter in the United States. Swainson's hawk arrives in California in early March to establish nesting territories and breed (California Department of Fish and Game 1994). They usually nest in large, mature trees. Most nest sites (87%) in the Central Valley are found in riparian habitats (Estep 1989:35), primarily because trees are more available there. Swainson's hawks also nest in mature roadside trees and in isolated trees in agricultural fields or pastures. The breeding season is from March through August (Estep 1989:12, 35).

Swainson's hawks were flying through the biological study~~affected~~ area during the 2011 field surveys. There are 12 records of Swainson's hawk nests in the biological study~~affected~~ area and within 0.5 mile of the study~~affected~~ area (California Department of Fish and Game 2012a). The majority of these records are for observations of nesting between 2001 and 2004. Ten of the reported nests are located south of Olivehurst. There are numerous additional records of occurrences within 5 miles of the study~~affected~~ area. The study~~affected~~ area and adjacent areas contain numerous suitable nest trees for Swainson's hawks. Field and row crops and ruderal areas provide suitable foraging habitat for Swainson's hawks in the study~~affected~~ area.

Northern Harrier

Northern harrier is a year-round resident throughout the Central Valley and is often associated with open grassland habitats and agricultural fields. Nests are found on the ground in tall, dense herbaceous vegetation (MacWhirter and Bildstein 1996). Northern harrier nests from April to September, with peak activity in June and July. The breeding population has been reduced, particularly along the southern coast, because of the destruction of wetland habitat, native grassland, and moist meadows and from the burning and plowing of nesting areas during early stages of breeding (Zeiner et al. 1990a:124).

There is one record of an occurrence of a nesting northern harrier within 5 miles of the ~~affected~~study area (California Department of Fish and Game 2012a). Northern harriers could forage in field and row crops and may nest in more densely vegetated ruderal areas in the study~~affected~~ area.

White-Tailed Kite

White-tailed kites generally inhabit low-elevation grassland, savannah, oak woodland, wetlands, agricultural, and riparian habitats. Some large shrubs or trees are required for nesting and for communal roosting sites. Nest trees range from small, isolated shrubs and trees to trees in relatively large stands (Dunk 1995:6, 8). White-tailed kites make nests of loosely piled sticks and twigs, lined with grass and straw, near the top of dense oaks, willows, and other tree stands. The breeding season lasts from February through October and peaks between May and August. They forage in undisturbed, open grassland, meadows, farmland, and emergent wetlands (Zeiner et al. 1990a:120).

There are no records of nesting white-tailed kites within 5 miles of the study~~affected~~ area (California Department of Fish and Game 2012a). The study~~project~~ area and adjacent areas contain numerous suitable nest trees for white-tailed kites. Field and row crops provide suitable foraging

habitat for white-tailed kites in the studyaffected area. Because white-tailed kite is fully protected, removal of occupied nest trees during the breeding season and activities that may result in loss of white-tailed kites are prohibited.

Bald Eagle

Bald eagle is a permanent resident and uncommon winter migrant in California (Zeiner et al. 1990a:122). The species breeds at coastal areas, rivers, lakes, and reservoirs with forested shorelines or cliffs in northern California. Wintering bald eagles are associated with aquatic areas containing some open water for foraging. Bald eagles nest in trees in mature and old growth forests that have some habitat edge and are somewhat close (within 1.25 miles) to water with suitable foraging opportunities. Although nests can be closer, the average distance of bald eagle nests to human development and disturbance is more than 1,640 feet (Buehler 2000:6). The breeding season is February through July (Zeiner et al. 1990a:122).

A bald eagle and a bald eagle nest were observed during the May 29–30, 2012, raptor survey. The nest is located adjacent toin the northern portion of the studyproject area, approximately 800 feet from the project areasite. It appears that this nest was identified in 2010 and documented in the CNDDB (California Department of Fish and Game 2012a). The Feather River provides suitable foraging habitat, and the riparian forest along the river provides suitable nesting habitat for bald eagles.

Western Yellow-Billed Cuckoo

Western yellow-billed cuckoo occurs at isolated sites in the Sacramento Valley in northern California and along the Kern and Colorado River systems in southern California during the breeding season and winters primarily in South America. Western yellow-billed cuckoos arrive at breeding grounds starting in mid- to late May and depart for wintering grounds between late August and mid-September. Once initiated, the breeding cycle is extremely rapid and requires only 17 days from egg-laying to fledging of young. Birds generally prefer open woodland with clearings and low, dense, scrubby vegetation often associated with watercourses. Western yellow-billed cuckoos occupy various woodlands, riparian forests, and thickets along streams and marshes, and successional shrubland. The suggested minimum patch size to benefit the species is approximately 50–100 acres, with a minimum width of 300 feet (Riparian Habitat Joint Venture 2004). Western yellow-billed cuckoos feed primarily on large insects, including caterpillars, katydids, cicadas, grasshoppers, and crickets in open areas, woodlands, orchards, and areas adjacent to streams (Hughes 1999).

There are two records (from 1976 and 1987) for occurrences of western yellow-billed cuckoo in the studyaffected area (California Department of Fish and Game 2012a). Portions ofThe riparian forest in and adjacent to the studyaffected area provides suitable nesting habitat for yellow-billed cuckoo. This bird also may forage throughout the studyaffected area.

Western Burrowing Owl

Western burrowing owls prefer open grasslands and shrublands with perches and burrows. They usually live and nest in the old burrows of California ground squirrels or other small mammals (Zeiner et al. 1990a:332) but also can nest in piles of wood or other debris. Burrows can be found on the sides of hills, along roadside embankments, on levees, along irrigation canals, near fence lines, and on or near other raised areas of land. The breeding season for burrowing owls extends from

February 1~~March~~ through August 31 (California Department of Fish and Game 2012c~~Zeiner et al. 1990a:332~~).

There is one record of an occurrence of a burrowing owl within 5 miles of the northern extent of the study~~affected~~ area (California Department of Fish and Game 2012a). Field and row crops and ruderal areas in the study area provide suitable foraging habitat for burrowing owls. They also may nest in burrows in ruderal areas and along the edges of agricultural areas in the study~~affected~~ area.

Loggerhead Shrike

Loggerhead shrikes occur in open habitats with scattered trees, shrubs, posts, fences, utility lines, or other types of perches. Nests are built in trees or shrubs with dense foliage and are usually hidden well. Loggerhead shrikes search for prey from perches and frequently impale their prey on thorns, sharp twigs, or barbed-wire. The nesting period for loggerhead shrikes is March through June (Zeiner et al. 1990a:546).

There are no CNDDB records of loggerhead shrike nests within 5 miles of the study~~project~~ area (California Department of Fish and Game 2012a). However, the study~~affected~~ area is within the range of this species and contains suitable trees for nesting and suitable foraging habitat (field and row crops).

Purple Martin

Purple martins occur in valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, riparian, and conifer habitats. They nest in old woodpecker cavities and in human-made structures such as bridges and culverts. Their breeding season is from April to August (Zeiner et al. 1990a:434).

There are no CNDDB records of purple martin nests within 5 miles of the study~~affected~~ area (California Department of Fish and Game 2012a). However, the study~~affected~~ area is within the range of this species and contains suitable nesting habitat (tree cavities and weep holes in bridges) and foraging habitat.

Bank Swallow

Bank swallows nest in burrows in erodible soils on vertical or near-vertical banks and bluffs in lowland areas dominated by rivers, streams, lakes, and oceans. Bank swallows generally dig new burrows each year, especially if the bank or cliff face used for nesting the previous year collapsed from erosion or human activities and no old burrows remain. They breed from April through July and depart for wintering grounds in South America between mid-August and mid-September. Foraging habitats include lakes, ponds, rivers and streams, meadows, fields, pastures, and occasionally forest and woodlands. Bank swallow is an aerial feeder, taking flying or jumping insects from dawn to dusk (Garrison 1999).

There are eight records of occurrences of bank swallows in and adjacent to the study~~affected~~ area (California Department of Fish and Game 2012a). Additional locations of bank swallow nests identified during surveys by DWR from 2011–2012 are also present adjacent to the study area. Although bank swallows are unlikely to nest in the majority of the study~~affected~~ area, they may nest close to it. Suitable foraging habitat is present in and adjacent to the study~~affected~~ area.

Yellow Warbler

Yellow warbler is a migrant and summer resident from late March through early October in California. It is largely extirpated as a breeder in the Sacramento Valley. Yellow warblers are found in riparian vegetation near streams and meadows. The breeding season is from April through late July (Shuford and Gardali 2008:332–334). Nests are generally placed 2–16 feet above the ground in young deciduous trees or in shrubs (Zeiner et al. 1990a:568). They will make several attempts at nesting throughout the season, but typically only produce one group of hatchlings per year (Shuford and Gardali 2008:336).

There are no records of occurrences of yellow warbler within 5 miles of the study~~affected~~ area (California Department of Fish and Game 2012a). The riparian forest and riparian scrub-shrub in the study~~affected~~ area provides suitable nesting and foraging habitat for yellow warbler.

Tricolored Blackbird

Tricolored blackbird is a highly colonial species that is largely endemic to California. Tricolored blackbird breeding colony sites require open, accessible water; a protected nesting substrate, including either flooded, thorny, or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony. Tricolored blackbird breeding colonies occur in freshwater marshes dominated by tules (*Scirpus* spp.) and cattails (*Typha* spp.), in Himalayan blackberries (*Rubus armeniacus*), and in silage and grain fields (Beedy and Hamilton 1997:3–4). The breeding season is from late February to early August (Beedy and Hamilton 1999). Tricolored blackbird foraging habitats in all seasons include annual grasslands, dry seasonal pools, agricultural fields (such as large tracts of alfalfa with continuous mowing schedules, and recently tilled fields), cattle feedlots, and dairies. Tricolored blackbirds also forage occasionally in riparian scrub habitats and along marsh borders. Weed-free row crops and intensively managed vineyards and orchards do not serve as regular foraging sites. Most tricolored blackbirds forage within 3 miles of their colony sites but commute distances of up to 8 miles have been reported (Beedy and Hamilton 1997:5).

There are seven records of occurrences of tricolored blackbird breeding sites within 5 miles of the study~~affected~~ area (California Department of Fish and Game 2012a). A very limited amount of suitable~~Suitable~~ breeding habitat for tricolored blackbirds is present in the study area~~may be present in or adjacent to the affected area~~. Tricolored blackbirds may forage in field and row crops in the study~~affected~~ area.

Western Red Bat

Western red bat occurs throughout much of California at lower elevations. It is found primarily in riparian and wooded habitats but also occurs seasonally in urban areas (Brown and Pierson 1996). Western red bats roost in the foliage of trees that often are located on the edge of habitats adjacent to streams, fields, or urban areas. This species breeds in August and September, and young are born in May through July (Zeiner et al. 1990b:60).

There are no CNDDB records of occurrences of western red bat within 5 miles of the study~~affected~~ area (California Department of Fish and Game 2012a), most likely because of a lack of survey data. Riparian forest and orchards in the study~~affected~~ area provide suitable roosting habitat for western red bat. Suitable foraging habitat is located throughout the study~~affected~~ area.

Hoary Bat

Hoary bats occur throughout California but are thought to have a patchy distribution in the southeastern deserts (Zeiner et al. 1990b:62). Hoary bats are found primarily in forested habitats, including riparian forests, and may occur in park and garden settings in urban areas. Day roost sites are in the foliage of coniferous and deciduous trees (Brown and Pierson 1996). Woodlands with medium to large trees with dense foliage provide suitable maternity roost sites (Zeiner et al. 1990b:62). Mating occurs in the fall, and after delayed fertilization, young are born May–June (Zeiner et al. 1990b:62; Brown and Pierson 1996).

There are no CNDDB records of occurrences of hoary bats within 5 miles of the ~~affected~~study area (California Department of Fish and Game 2012a), most likely because of a lack of survey data. Riparian forest in the study~~affected~~ area provides suitable roosting habitat, and suitable foraging habitat is located throughout the study~~affected~~ area.

Silver-Haired Bat

Silver-haired bats occur primarily in the northern portion of California and at higher elevations in the southern and coastal mountain ranges (Brown and Pierson 1996) but may occur anywhere in California during their spring and fall migrations. They are associated with coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats (Zeiner et al. 1990b:54). Silver-haired bats roost in trees almost exclusively in the summer, and maternity roosts typically are located in woodpecker hollows. Maternal colonies range from several to about 75 individuals (Brown and Pierson 1996). Mating occurs in the fall, and after delayed fertilization, young are born June–July (Zeiner et al. 1990b:54; Brown and Pierson 1996). Winter roost sites include hollow trees, rock crevices, mines, caves, and houses. They also have been found hibernating in leaf litter (Brown and Pierson 1996).

There is one record of an occurrence of silver-haired bat within 5 miles of the study~~affected~~ area (California Department of Fish and Game 2012a). Riparian forest in the study~~affected~~ area provides suitable roosting habitat, and suitable foraging habitat is located throughout the study~~affected~~ area.

Pallid Bat

Pallid bat is found throughout most of California at low to middle elevations (6,000 feet). Pallid bats are found in a variety of habitats, including desert, brushy terrain, coniferous forest, and non-coniferous woodlands. In central and northern California, the species is associated with oak, ponderosa pine, redwood, and giant sequoia habitats. Pallid bats forage among vegetation and above the ground surface, eating large ground-dwelling arthropods and large moths. Daytime roost sites include rock outcrops, mines, caves, hollow trees, buildings, and bridges. Night roosts are commonly under bridges but are also in caves and mines (Brown and Pierson 1996). Hibernation may occur during late November through March. Pallid bats breed from late October through February (Zeiner et al. 1990b:70), and one or two young are born in May or June (Brown and Pierson 1996).

There are no CNDDB records of occurrences for pallid bat within 5 miles of the ~~affected~~study area (California Department of Fish and Game 2012a). Riparian forest in the ~~affected~~study area provides suitable nesting and foraging habitat for this species.

Ringtail

Ringtails are found throughout most of California except for the San Joaquin Valley and portions of the southern deserts (California Department of Fish and Wildlife 2013). Ringtails occur in various riparian habitats and brush stands of most forest and shrub habitats usually within 0.5 mile of water, including such habitat in deserts (California Department of Fish and Wildlife 2013 life history; NatureServe 2013). They use hollow trees, logs, snags, cavities in talus and other rocky areas for daytime shelter (California Department of Fish and Wildlife 2013; NatureServe 2013). Denning habitat is similar to sheltering habitat but can include abandoned burrows of other mammals, woodrat nests, and manmade structures (California Department of Fish and Wildlife 2013; NatureServe 2013). Ringtails change dens often (NatureServe 2013; Wyatt pers. comm.). Breeding occurs between February and May, but mainly in March and April, and litters of 1 to 4 are usually born in May and June (California Department of Fish and Wildlife 2013; NatureServe 2013). Young are weaned by the end of summer (NatureServe 2013). Ringtails are nocturnal and feed primarily on arthropods, small mammals, and fruits (NatureServe 2013).

Ringtail is not tracked in the CNDDB. Ringtail is known to occur along the Feather River within the biological study area (Wyatt pers. comm.). Riparian forest in the study area provides suitable habitat for ringtail. They may travel along the base of the levee between the levee and the Feather River (Wyatt pers. comm.).

3.9.3 Environmental Consequences

This section describes the environmental consequences relating to wildlife for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.9.3.1 Assessment Methods

This evaluation of wildlife is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the expected magnitude, intensity, and duration of activities related to the construction and operation of this project.

Potential direct effects (permanent and temporary) on wildlife habitat were quantified based on estimated habitat losses within proposed construction footprints and staging areas by alternative. Potential indirect effects of each project alternative were evaluated more qualitatively because they would occur farther from the project area or later in time, and are more difficult to evaluate quantitatively. Because potential borrow sites would be utilized for all three alternatives, impacts ~~to~~on special-status wildlife and their habitats at the borrow sites would apply to each alternative. ~~As mentioned above, borrow sites recently were identified and have not been surveyed yet. Depending on the habitats present at these sites, additional wildlife species may be affected. Information collected during surveys will be needed to determine effects and appropriate mitigation measures.~~

Effect Mechanisms

The following project-related activities could affect wildlife resources in the affected area either directly or indirectly. Direct effects can be either temporary (return to baseline conditions within a

year of disturbance) or permanent in duration. These effects were used to assess effects on wildlife resources.

Direct Effects

Direct effects on wildlife could be caused by the following actions.

- Vegetation clearing (including tree removal), grading, excavating/trenching, and paving activities during construction.
- Temporary stockpiling and sidecasting of soil, construction materials, or other construction wastes, and soil-bentonite mixing basins.
- Excavation of borrow material ~~offsite~~.
- Soil compaction, dust, and water runoff from the construction site.
- Increased vehicle traffic.
- Short-term construction-related noise (from equipment) and visual disturbance.
- Degradation of water quality in drainages and other water bodies resulting from construction runoff containing petroleum products.

Indirect Effects

Indirect effects on wildlife could be caused by the following actions.

- Permanent alterations to light and noise levels.
- Alterations to hydrology.
- Damage through toxicity associated with herbicides and rodenticides.
- Introduction of invasive (nonnative) species.

3.9.3.2 Determination of Effects

For this analysis, an effect pertaining to wildlife was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Have a substantial significant effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by ~~DFG~~CDFW or USFWS.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted habitat conservation plan, natural communities conservation plan, or other approved local, regional, or state habitat conservation plan.
- Contribute to a substantial reduction or elimination of species diversity or abundance.

Qualitative relationships between environmental conditions during and after construction and the biology of the animal species affected are the basis of the effect assessment. Cause and effect relationships are identified for assessed species, including the relationship between environmental conditions and habitat, and the effects of changes in habitat on survival.

The effect analysis quantifies direct effects on wildlife based on habitat losses and other quantifiable habitat changes (noise, dust, hydrology, etc.) and is based on site-specific information. The mitigation measures described for potential effects on sensitive wildlife resources ~~have not been developed through formal consultation or coordination with resource agencies (DFG, USFWS, NMFS, USACE) but~~ are based on standard agency-approved guidelines and recommendations, and standards of professional practice when guidelines and recommendations are not available, with some input from CDFW and USFWS during informal consultation with these agencies.

3.9.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning wildlife resources are summarized in Table 3.9-3.

Table 3.9-3. Summary of Effects for Wildlife

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
Effect WILD-1: Potential Mortality of or Loss of Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle	Significant	WILD-MM-1: ~~Conduct Focused Surveys for~~Fence and Avoid Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle and Implement Protective Measures	Less than significant
Effect WILD-2: Potential Mortality or Disturbance of VELB and its Habitat (Elderberry Shrubs)	Significant	WILD-MM-2: Conduct VELB Surveys Prior to Elderberry Shrub Transplantation WILD-MM-3: Implement Measures to Protect~~ive Measures and Compensate for Effects on~~ VELB and its Habitat WILD-MM-4: Compensate for Effects on VELB and its Habitat	Less than significant
Effect WILD-3: Potential Mortality or Disturbance of Western Pond Turtle	Significant	WILD-MM-5~~3~~: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-4: Potential Disturbance or Mortality of and ~~Temporary~~ Loss of Suitable Habitat for Giant Garter Snake	Significant	WILD-MM-64: Avoid and Minimize Construction Effects on Giant Garter Snake WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-MM-85: Compensate for Permanent Loss of Suitable Giant Garter Snake Habitat WILD-MM-9: Restore Temporarily Disturbed Giant Garter Snake Aquatic and Upland Habitat to Pre-Project Conditions	Less than significant
Effect WILD-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-106: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-117: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction and Implement Protective Measures during Construction WILD-MM-128: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk	Less than significant
Effect WILD-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special Status Birds and Removal of Suitable Breeding Habitat	Significant	WILD-MM-106: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-1390: Conduct Nesting Surveys for Special-Status and Non–Special Status Birds and Implement Protective Measures during Construction	Less than significant
Effect WILD-7: Potential Loss or Disturbance of Western Burrowing Owl and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-106: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-1410: Conduct Surveys for Western Burrowing Owl prior to Construction and Implement Protective Measures if Found WILD-MM-1511: Compensate for the Loss of Occupied Western Burrowing Owl Habitat	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-8: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-16~~12~~: ~~Conduct Preconstruction Surveys for~~ Identify Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-9: Potential Injury, Mortality or Disturbance of Ringtail and Removal of Habitat	Significant	WILD-MM-17: Identify Suitable Shelter and Denning Habitat for Ringtail and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-10~~9~~: Disturbance to or Loss of Common Wildlife Species and Their Habitats	Less than significant	None required	Less than significant
Effect WILD-11~~0~~: Potential Disruption of Wildlife Movement Corridors	Less than significant	None required	Less than significant
Effect WILD-12~~1~~: Conflict with Provisions of an Adopted HCP/NCCP or other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

3.9.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies in levees along 44 miles of the west bank of the Feather River between the Sutter Bypass and Thermalito Afterbay. Current levee O&M activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions. No construction-related effects on wildlife, such as displacement or loss of habitat, would occur.

Because no levee improvements would be made under the No Action Alternative, the risk that the levees along the west bank of the Feather River could fail because of seepage or slope stability/geometry issues would continue. A catastrophic levee failure would result in flooding and inundation that could significantly affect wildlife and their upland or wetlands habitats, resulting in mortality of individuals, physical displacement, and temporary loss or permanent alterations of habitat. In addition, cleanup and repair activities could result in physical displacement for extended periods of time and significant effects on habitat. A major flood event along the Feather River corridor could result in damage to the riparian forest between the river and the levees. Given the importance of this riparian corridor for numerous special-status species and for the Pacific flyway (a major travel route for migratory birds in North America) in general, loss or fragmentation of this habitat would be a significant effect, and it could take decades for a mature riparian forest to reestablish itself in the affected areas. Given the uncertainty of the occurrence or magnitude of such an event, potential effects on wildlife and their habitats cannot be quantified based on available information.

3.9.4.2 Alternative 1

Alternative 1 addresses deficiencies in the levee primarily using cutoff walls such that increases in the overall footprint of the levee are minimized. Implementation of Alternative 1 would potentially result in effects on wildlife resources. These potential effects and related mitigation measure requirements are summarized in Table 3.9-4 and discussed below. A summary of effects on land cover and habitats for special-status wildlife for Alternative 1 is shown in Table 3.9-5.

Table 3.9-4. Wildlife Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-1: Potential Mortality of or Loss of Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle	Significant	WILD-MM-1: ~~Conduct Focused Surveys for~~Fence and Avoid Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle and Implement Protective Measures	Less than significant
Effect WILD-2: Potential Mortality or Disturbance of VELB and its Habitat (Elderberry Shrubs)	Significant	WILD-MM-2: Conduct VELB Surveys Prior to Elderberry Shrub Transplantation WILD-MM-3: Implement Measures to Protect~~ive Measures and Compensate for Effects on~~ VELB and its Habitat WILD-MM-4: Compensate for Effects on VELB and its Habitat	Less than significant
Effect WILD-3: Potential Mortality or Disturbance of Western Pond Turtle	Significant	WILD-MM-5~~3~~: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed	Less than significant
Effect WILD-4: Potential Disturbance or Mortality of and ~~Temporary~~ Loss of Suitable Habitat for Giant Garter Snake	Significant	WILD-MM-6~~4~~: Avoid and Minimize Construction Effects on Giant Garter Snake WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-MM-8~~5~~: Compensate for Permanent Loss of Suitable Giant Garter Snake Habitat WILD-MM-9: Restore Temporarily Disturbed Giant Garter Snake Aquatic and Upland Habitat to Pre-Project Conditions	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-11~~7~~: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction and Implement Protective Measures during Construction WILD-MM-12~~8~~: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk	Less than significant
Effect WILD-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special Status Birds and Removal of Suitable Breeding Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-13~~90~~: Conduct Nesting Surveys for Special-Status and Non–Special Status Birds and Implement Protective Measures during Construction	Less than significant
Effect WILD-7: Potential Loss or Disturbance of Western Burrowing Owl and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-14~~10~~: Conduct Surveys for Western Burrowing Owl prior to Construction and Implement Protective Measures if Found WILD-MM-15~~11~~: Compensate for the Loss of Occupied Western Burrowing Owl Habitat	Less than significant
Effect WILD-8: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-16~~12~~: ~~Conduct Preconstruction Surveys for~~Identify Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-9: Potential Injury, Mortality or Disturbance of Ringtail and Removal of Habitat	Significant	WILD-MM-17: Identify Suitable Shelter and Denning Habitat for Ringtail and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-10~~9~~: Disturbance to or Loss of Common Wildlife Species and Their Habitats	Less than significant	None required	Less than significant
Effect WILD-11~~0~~: Potential Disruption of Wildlife Movement Corridors	Less than significant	None required	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-121: Conflict with Provisions of an Adopted HCP/NCCP or other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

Table 3.9-5. Effects on Special-Status Species Habitat for Alternative 1

Special-Status Species	Habitat	Permanent/Temporary (acres)
Antioch Dunes anthicid, Sacramento anthicid, and Sacramento Valley tiger beetle	Sandy riparian areas	0/0
Valley elderberry longhorn beetle	Elderberry shrubs	88[1]90/72*
Western pond turtle aquatic habitat	Canals and ditches, ponds and basins, forested/shrub wetland, open water, streams and rivers, tailings wetlands	25.62/0.99
Giant garter snake and western pond turtle aquatic habitat	Canals and ditches, Drainage ditch, freshwater emergent, irrigation ditch, open water, ponds	0.73/23.640.96/0
Giant garter snake upland habitat	Ruderal within 200 feet of aquatic habitat	1.174.17/0143.41
Swainson's hawk, white-tailed kite, bald eagle, western yellow-billed cuckoo, purple martin, yellow warbler, and other birds nesting and foraging habitat, and ringtail	Riparian forest trees and other trees	844[2]13.03/0.47
Swainson's hawk, white-tailed kite, northern harrier, burrowing owl, and tricolored blackbird foraging habitat	Field and row crops and ruderal	568.37/10.6517.41/744.48
Bank swallow	Bluffs and banks of streams/ levees adjacent to water	0/0
Bat roosting habitat	Riparian forest and orchard	265.62/27.89223.66/38.16

1* For valley elderberry longhorn beetle, the effects is the number of elderberry shrubs to be removedare given in numbers of shrubs, not acres.
2 This is the number of trees over 4 inches in diameter at breast height that would be removed.

The following mitigation measures described in Section 3.8, *Vegetation and Wetlands,* would apply to the wildlife resources discussed below and would be implemented to avoid and minimize affects on special-status wildlife.

Mitigation Measure VEG-MM-2: Install Exclusion Fencing and/or K-rails along the Perimeter of the Construction Work Area and Implement General Measures to Avoid Effects on Sensitive Natural Communities and Special-Status Species

Mitigation Measure VEG-MM-3: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel

Mitigation Measure VEG-MM-4: Retain a Biological Monitor

For brevity, these measures are not repeated for each species or group of species discussed below.

Effect WILD-1: Potential Mortality of or Loss of Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle

Only one area of potentially suitable habitat was identified within the biological study area during field surveys. This area is not located within the construction area for any of the proposed alternatives. Construction activities that remove or disturb sandy riparian areas could result in the mortality of larvae or adults of Antioch Dunes anthicid, Sacramento anthicid, and Sacramento Valley tiger beetle. Beetles could be crushed by construction equipment or personnel, and suitable habitat could be modified or removed during ground-disturbing activities. Because these beetle species are rare and are only known from few locations in the project vicinity, loss of individuals and modification or removal of habitat would be considered significant effects. Implementation of the following mitigation measures would reduce these effects to less than significant.

Mitigation Measure WILD-MM-1: Fence and Avoid~~Conduct Focused Surveys for~~ Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle and Implement Protective Measures

The area of potentially ~~Wildlife biologists will conduct surveys for~~ suitable habitat for Antioch Dunes anthicid, Sacramento anthicid, and Sacramento Valley tiger beetle will be identified on construction plans and fenced prior to the start of construction. ~~The biologists will map these areas using a GPS unit. If possible, these areas will be avoided during construction.~~No foot or vehicle traffic will be allowed within the fenced area. The fencing will be removed when construction is complete. If avoidance is not possible, or new areas of potential habitat are identified and cannot be avoided, a qualified entomologist will survey the suitable habitat areas for the presence of these three beetle species to determine their presence. If recommended by the entomologist and supported by the wildlife agencies, the beetles may be relocated to suitable habitat prior to the start of construction in the habitat to be affected.

Effect WILD-2: Potential Mortality or Disturbance of VELB and its Habitat (Elderberry Shrubs)

Approximately 89 ~~E~~elderberry shrubs, which provide habitat for the VELB, would be removed or disturbed by activities associated with construction of Alternative 1 (Table 3.9-5). Removal of elderberry shrubs requires consultation with USFWS under Section 7 or 10 and compensation, as outlined in USFWS's guidelines. Removal or disturbance of elderberry shrubs could result in the mortality or disturbance of VELB. Noise and dust generated during construction also may directly affect adult VELB or exposed larvae or eggs (Talley and Holyoak 2009:10). Soil disturbance adjacent to shrubs may affect the roots and subsequent health of elderberry shrubs. Shrubs located farther from the construction area and those sheltered by surrounding vegetation are expected to have fewer construction-related effects than shrubs that are closer to the construction area and in more open areas. If additional elderberry shrubs must be removed because of PG&E facility relocations, consultation with USFWS would be reinitiated by SBFCA and additional compensation would be required. The removal or disturbance of 89~~162~~ elderberry shrubs would be considered a significant effect on VELB. Implementation of the following mitigation measures would reduce this effect to a less-than-significant level.

Mitigation Measure WILD-MM-2: Conduct VELB Surveys Prior to Elderberry Shrub Transplantation

Surveys of elderberry shrubs to be transplanted will be conducted by a qualified biologist prior to transplantation. Surveys will be conducted in accordance with the Conservation Guidelines for the VELB (U.S. Fish and Wildlife Service 1999b). The biologist will survey the area surrounding the shrub to be transplanted to ensure that there aren't additional elderberry shrubs that need to be removed. Surveys will consist of counting and measuring the diameter of each stem, and examining elderberry shrubs for the presence of VELB exit holes. Survey results and an analysis of the number of elderberry seedlings/cuttings and associated native plants based on the survey results will be submitted to USFWS. For compensation, SBFCA plans to plant elderberry seedlings/cuttings and associated native plants prior to transplantation of elderberry shrubs. The data collected during the surveys prior to transplantation will be used to determine if SFBCA is exceeding their compensation requirements or if additional plantings are necessary. Because the proposed project would be constructed in four separate contracts, elderberry survey data for each contract will be used to rectify any discrepancies in compensation for the previous contract and to ensure that SBFCA has fully mitigated for impacts on VELB. If additional elderberry shrubs must be removed to accommodate the relocation of PG&E facilities, consultation with USWFS will be reinitiated by SBFCA, the shrubs will be surveyed as discussed above, and compensation will be adjusted to ensure that additional impacts on VELB are fully mitigated.

Mitigation Measure WILD-MM-3: Implement Measures to Protect~~ive Measures and Compensate for Effects on~~ VELB and its Habitat

~~Complete avoidance of effects on VELB is assumed when a 100-foot buffer around elderberry shrubs is established and maintained during construction (U.S. Fish and Wildlife Service 1999a). Elderberry shrubs in the construction area that cannot be protected will be transplanted between November 1 and February 14 in accordance with to USFWS-approved procedures outlined in the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (U.S. Fish and Wildlife Service 1999a). Removal of elderberry shrubs requires consultation with USFWS under Section 7 or 10 and compensation, as outlined in USFWS's guidelines. Elderberry shrubs within 100 feet of the construction area that will not be removed will be protected with orange construction barrier fencing. The width of the buffer from the dripline of elderberry shrubs will be determined through consultation with USFWS.~~ Elderberry shrubs/clusters within 100 feet of the construction area or PG&E facility relocation work areas that will not be removed will be protected during construction. A qualified biologist (i.e., with elderberry/VELB experience), under contract to SBFCA, will mark the elderberry shrubs and clusters that will be protected during construction. Orange construction barrier fencing will be placed at the edge of the respective buffer areas. The buffer area distances will be proposed by the biologist and approved by USFWS. No construction activities will be permitted in the buffer zone other than those activities necessary to erect the fencing. Signs will be posted along fencing for the duration of construction and will contain the following information.

This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.

In some cases, where the elderberry shrub dripline is within 10 feet of the work area, k-rails will be placed at the shrub's dripline to provide additional protection to the shrub from construction equipment and activities. Temporary fences around the elderberry shrubs and k-rails at shrub driplines will be installed as the first order of work. Temporary fences will be furnished, constructed, maintained, and later removed, as shown on the plans, as specified in the special provisions, and as directed by the project engineer. Temporary fencing will be 4 feet (1.2 meters) high, commercial-quality woven polypropylene, orange in color.

Buffer area fences around elderberry shrubs will be inspected weekly by a qualified biologist during ground-disturbing activities and monthly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor and the resident engineer. The biological monitor will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. Biological inspection reports will be provided to the project lead and USFWS.

SBFCA will ensure that the project site will be watered down as necessary to prevent dust from becoming airborne and accumulating on elderberry shrubs in and adjacent to the project site.

Mitigation Measure WILD-MM-4: Compensate for Effects on VELB and its Habitat

Before construction begins, SBFCA will compensate for direct effects on elderberry shrubs by transplanting shrubs that cannot be avoided to a USFWS-approved conservation area (i.e., the Star Bend Mitigation Area). Elderberry seedlings or cuttings and associated native species will also be planted in the conservation area. Each elderberry stem measuring 1 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) will be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems). The numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs to be planted as replacement habitat are determined by stem size class of affected elderberry shrubs, presence or absence of exit holes, and whether the shrub lies in a riparian or non-riparian area. Stock of either seedlings or cuttings would be obtained from local sources. The numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs will be estimated based on existing elderberry shrub survey data and adjusted according to elderberry survey data collected during implementation of Mitigation Measure WILD-MM-2. As discussed in that measure, SBFCA plans to plant elderberry seedlings/cuttings and associated native plants prior to transplantation of elderberry shrubs. The data collected during the surveys prior to transplantation will be used to determine if SFBCA is exceeding their compensation requirements or if additional plantings are necessary. Because the proposed project would be constructed in four separate contracts, elderberry survey data for each contract will be used to rectify any discrepancies in compensation for the previous contract and to ensure that SBFCA has fully mitigated for impacts on VELB. If additional elderberry shrubs must be removed to accommodate the relocation of PG&E facilities, consultation with USFWS will be reinitiated by SBFCA, the shrubs will be surveyed as discussed above, and compensation will be adjusted to ensure that additional impacts on VELB are fully mitigated.

At the discretion of USFWS, shrubs that are unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible, minimization ratios would be increased to offset the additional habitat loss.

The relocation of the elderberry shrubs will be conducted according to USFWS-approved procedures outlined in the Conservation Guidelines (U.S. Fish and Wildlife Service 1999a). Elderberry shrubs within the project construction area that cannot be avoided will be transplanted during the plant's dormant phase (November through the first 2 weeks of February). A qualified biological monitor will remain onsite while the shrubs are being transplanted.

Effect WILD-3: Potential Mortality or Disturbance of Western Pond Turtle

Aquatic and upland (overwintering, nesting) habitat for western pond turtle may be removed or temporarily disturbed by construction activities or PG&E facility relocations. Western pond turtles may be killed, injured, or disturbed by activities that remove suitable aquatic or upland habitat. Construction activities (such as grading and movement of heavy equipment) could result in the destruction of pond turtle nests containing eggs or young individuals if affected areas are being used for egg deposition. Declines in populations of western pond turtles throughout the species range have been documented (Jennings and Hayes 1994). Loss of individuals in the project area could diminish the local population and lower reproductive potential, which could contribute to the further decline of this species. The loss of upland nesting sites or eggs also would decrease the local population. This effect would be significant, but implementation of the following mitigation measure would reduce this effect to a less-than-significant level.

Mitigation Measure WILD-MM-5~~3~~: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed

One week before and within 24 hours of beginning work in suitable aquatic habitat, a qualified biologist (one who is familiar with different species of turtles) will conduct surveys for western pond turtle. The surveys should be timed to coincide with the time of day and year when turtles are most likely to be active (during the cooler part of the day between 8 a.m. and 12 p.m. during spring and summer). Prior to conducting the surveys, the biologist should locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to quietly observe turtles. Each survey should include a 30-minute wait time after arriving on site to allow startled turtles to return to open basking areas. The survey should consist of a minimum 15-minute observation time per area where turtles could be observed. If western pond turtles are observed during either survey, a biological monitor should be present during construction activities in the aquatic habitat where the turtle was observed and will capture and remove, if possible, any entrapped turtle. The biological monitor also will be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat and periodically inspect these areas for nests and turtles. The biological monitor's ~~DFG~~CDFW scientific collecting permit will include capture and relocation of turtles.

Effect WILD-4: Potential Disturbance or Mortality of and Loss of Suitable Habitat for Giant Garter Snake

Construction of Alternative 1 would result in temporary and permanent losses of suitable aquatic and upland habitat for giant garter snake. Construction activities and PG&E facility relocations in suitable habitat could result in the injury, mortality, or disturbance of giant garter snakes, which requires consultation with USFWS under Section 7 and compensation, as outlined in the *Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced,*

Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, *California* (Programmatic Consultation) (U.S. Fish and Wildlife Service 1997). Construction activities could remove, compact, fill, or otherwise impact California ground squirrel burrows along the levee, resulting in potential injury or mortality of giant garter snakes and loss of suitable refuge habitat. Maintenance activities that remove or fill burrows or eliminate ground squirrels would also limit the amount of available refuge habitat for giant garter snake along the levee. Grouting burrows (filling burrows with cement) is not a common maintenance practice currently, and its use is not expected to increase after the proposed project is complete. Loss of habitat and potential injury or mortality of snakes are considered significant effects because the project could reduce the local population size of a federally and state-listed species. This effect would be significant, but implementation of the following mitigation measures would reduce this effect to a less-than-significant level.

Mitigation Measure WILD-MM-~~6~~4: Avoid and Minimize Construction Effects on Giant Garter Snake

The following measures will be implemented to avoid, minimize, and compensate for effects on giant garter snake and its habitat.

- To the maximum extent possible, all construction activity in giant garter snake aquatic and upland habitat within 200 feet of aquatic habitat will be conducted during the snake's active period (between May 1 and October 1). During this timeframe, potential for injury and mortality are lessened because snakes are actively moving and avoiding danger. Giant garter snakes are more vulnerable to danger during their inactive period because they are occupying underground burrows or crevices and are more susceptible to direct effects, especially during excavation. Small irrigation ditches on the landside of the levee that need to be moved outward from the existing levee will be completely dried, removed, and relocated during the May 1–October 1 timeframe.
- For work that cannot be conducted between May 1 and October 1, additional protective measures will be determined during consultation with USFWS.
- To reduce the likelihood of snakes entering the construction area, SBFCA will install exclusion fencing and orange construction barrier fencing along the edge of the construction area that is within 200 feet of suitable habitat. The exclusion and barrier fencing will be installed during the active period for giant garter snakes (May 1 to October 1) to reduce the potential for injury and mortality during this activity. The exclusion~~barrier~~ fencing will consist of 3~~ to 4~~-foot-tall silt~~erosion~~ fencing buried ~~at least 6~~4–6~~8~~ inches below ground level. The ~~barrier~~exclusion fencing will ensure that giant garter snakes are excluded from the construction area and that suitable upland and aquatic habitat is protected throughout construction.
- A USFWS-approved biologist will conduct a preconstruction survey in suitable habitat no more than 24 hours before construction. Prior to construction activities each morning, construction personnel will inspect exclusion and orange barrier fencing to ensure they are both in good working order. If any snakes are observed in the construction area during this inspection or at any other time during construction, the USFWS-approved biologist will be contacted to survey the site for snakes. The project area will be re-inspected and surveyed whenever a lapse in construction activity of 2 weeks or more has occurred. If a snake (believed to be a giant garter snake) is encountered during construction, activities will cease

until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed.

- Vegetation clearing within 200 feet of the banks of suitable giant garter snake aquatic habitat will be limited to the minimum area necessary. Avoided giant garter snake habitat within or adjacent to the project area will be flagged and designated as an environmentally sensitive area, to be avoided by all construction personnel.
- The movement of heavy equipment within 200 feet of the banks of potential giant garter snake aquatic habitat will be confined to designated haul routes to minimize habitat disturbance.
- To avoid entrapment of , thereby preventing injury or mortality resulting from falling into trenches, all excavated areas more than 1 foot deep will be provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each workday. If escape ramps cannot be provided, then holes or trenches will be covered with plywood or other hard material.
- Relocation of PG&E facilities in giant garter snake habitat will be conducted during the snake's active period (between May 1 and October 1). Because PG&E facilities will need to be relocated in advance of construction activities, preactivity surveys will be conducted prior to relocation activities when these occur in suitable habitat for giant garter snake.

Mitigation Measure WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl

SBFCA will ensure, through an operations and maintenance plan or other plan, that maintenance activities that impact suitable habitat along the levee are minimized to the maximum extent feasible and in conjunction with the existing O&M manual. The plan should include measures that avoid and reduce potential injury and mortality of giant garter snake and western burrowing owl, and minimize the loss of burrows that these species utilize. The plan should be developed in coordination with USFWS and CDFW and may include some of the following measures.

- Minimize vegetation control by burning and conduct vegetation mowing during the active period (May 1–October 1) of giant garter snake.
- Avoid grouting of burrows. If grouting must occur, conduct during the active period of giant garter snake (May 1–October 1). A qualified biologist will examine the burrow to be grouted for evidence of use by western burrowing owl and conduct early morning surveys of the burrow to confirm it is not occupied by western burrowing owl. Once the burrow is determined to be unoccupied by western burrowing owl, install exclusion fencing with a one-way exit so that any giant garter snakes can exit the burrow and not go back in. The exclusion fencing and one-way exit should be left in place for 24 hours before grouting.
- Prepare a database of sensitive areas along the levee and requirements for maintenance personnel to utilize when planning and conducting maintenance activities.
- Train staff to recognize western burrowing owl and their sign and to avoid removing burrows in areas where owls or their sign are observed.

- Coordinate compensation for permanent loss of burrow habitat for giant garter snake and western burrowing owl through regional habitat conservation plans/ natural community conservation plans.

Mitigation Measure WILD-MM-~~8~~5: Compensate for Permanent Loss of Suitable Giant Garter Snake Habitat

Compensation for permanent effects on giant garter snake aquatic and upland habitat will follow the guidance in the Programmatic Consultation. SBFCA will compensate for the permanent loss of suitable aquatic habitat and upland habitat for giant garter snake by purchasing preservation credits equal at a USFWS and CDFW approved conservation bank. The habitat at the conservation bank will be protected in perpetuity for giant garter snake. Prior to the start of construction (excluding Reach 13, as there is no giant garter snake habitat in this reach), SBFCA will provide funding to the conservation bank for giant garter snake habitat preservation credits. The transaction will take place through a purchase and sale agreement, and funds must be transferred within 30 days, and before any construction activities are initiated. SBFCA will provide the USFWS and CDFW with copies of the credit sale agreement and fund transfer. If additional giant garter snake habitat will be permanently removed because of PG&E facility relocations, consultation with USFWS would be reinitiated and additional compensation would be required. ~~To compensate for the direct and indirect effects on habitat for giant garter snake, SBFCA will acquire a fee title or conservation easement for an offsite location. If an offsite location is not logistically feasible, alternative options will be investigated, such as purchasing mitigation credits at a USFWS- and DFG-approved conservation bank (if available), or contributing to an in-lieu species fund. Final acreage effects based on the 65% project design will be submitted to the USFWS and DFG to assess the final required mitigation.~~

Mitigation Measure WILD-MM-9: Restore Temporarily Disturbed Aquatic and Upland Habitat to Pre-Project Conditions

Upon completion of the construction, SBFCA will restore temporarily affected suitable and upland habitat for giant garter snake to pre-project conditions. Restoration of aquatic vegetation and annual grassland will be detailed in a mitigation and monitoring plan that will be reviewed and approved by USACE and USFWS prior to the start of construction. If additional giant garter snake habitat will be temporarily removed because of PG&E facility relocations, consultation with USFWS would be reinitiated by SBFCA and PG&E will restore temporarily affected habitat to pre-project conditions.

Effect WILD-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and Loss of Nesting and Foraging Habitat

Construction and PG&E facility relocations are~~is~~ anticipated to occur between April 15 and November 30, which is during the breeding season of Swainson's hawks (March through August). Construction activities and removal of trees could result in the loss or disturbance of Swainson's hawk during the nesting season. Removal of nests or suitable nesting habitat and construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Removal of active nest trees or anticipated disturbance that may result in nest abandonment would require an incidental take permit from ~~DFG~~CDFW. Effects on potential nesting habitat (riparian forest) and foraging habitat (row/field crops and ruderal grassland) for Swainson's hawk are shown in Table 3.9-5. Because the availability of foraging habitat

has been closely tied to the breeding success of this species, projects that would significantly modify suitable Swainson's hawk foraging habitat are considered to have potential to significantly affect this species (California Department of Fish and Game 1994). Loss of Swainson's hawk eggs or nests, any activities resulting in nest abandonment, and loss of nesting and foraging habitat would be considered significant effects. Implementation of Mitigation Measure VEG-MM-1, Compensate for the Loss of Woody Riparian TreesHabitat, would compensate for the loss of potential nesting habitat for Swainson's hawk. Implementation of the following mitigation measures would reduce these effects to a less-than-significant level.

Mitigation Measure WILD-MM-106: Conduct Vegetation Removal Activities outside the Breeding Season for Birds

To the maximum extent feasible, SBFCA and PG&E will schedule vegetation (trees, shrubs, ruderal areas) removal/trimming during the nonbreeding season of birds (September 1–January 31). If vegetation removal cannot be removed in accordance with this timeframe, preconstruction/preactivity surveys for nesting birds and additional protective measures will be implemented (see Mitigation Measure WILD-MM-139). SBFCA and PG&E will not remove trees with active Swainson's hawk or other active raptor nests. Because white-tailed kite is fully protected, removal of trees with active nests and activities that may result in loss of white-tailed kites are prohibited.

Mitigation Measure WILD-MM-117: Conduct Focused Surveys for Nesting Swainson's Hawk Prior to Construction and Implement Protective Measures during Construction

Because construction is anticipated to begin in the middle of the Swainson's hawk nesting period, surveys for nesting Swainson's hawks will be conducted in the spring one year before construction and inDuring the spring prior toof the year of construction., fFocused surveys for Swainson's hawk will be conducted in the project area and in a buffer area up to 0.5 mile around the project area. The size of the buffer area surveyed will be based on the type of habitat present and line of sight from the construction area to surrounding suitable breeding habitat. Buffer areas containing unsuitable nesting habitat and/or with an obstructed line of sight to the project area will not be surveyed. Biologists will focus on suitable nest trees within and immediately adjacent to the project area that have the highest likelihood for disturbance. The number of surveys needed to determine the status of nesting will be dependent on the conditions during the surveys and behavior of the hawks. If needed, biologists will coordinate with DFGCDFW regarding the extent and number of surveys. Surveys would generally be conducted between February and July. Survey methods and results will be reported to DFGCDFW.

To the maximum extent feasible, PG&E will conduct facility relocations outside of the Swainson's hawk nesting period. Because PG&E facilities will need to be relocated in advance of construction activities, surveys for Swainson's hawks nests may be occurring concurrently with facility relocations, if the relocations occur during the nesting period. Information collected during surveys will be used to determine if facility relocations may impact nesting Swainson's hawks.

If active nests are found, SBFCA and PG&E will maintain a 0.25-mile buffer or other distance determined appropriate through consultation with DFGCDFW, between construction activities and the active nest(s) until it has been determined that young have fledged. In addition, a qualified biologist (experienced with raptor behavior) will be present on site (daily) during

construction activities occurring during the breeding season to watch for any signs of stress. If nesting birds are observed to exhibit agitated behavior indicating that they are experiencing stress, construction activities will cease until the qualified biologist, in consultation with ~~DFG~~CDFW, determines that young have fledged.

Mitigation Measure WILD-MM-12~~8~~: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk

Permanent removal~~Removal~~ of suitable foraging habitat for Swainson's hawks will be mitigated by providing offsite habitat management lands as described in ~~DFG~~CDFW's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (California Department of Fish and Game 1994). The final acreage of off-site management lands to be provided will depend on the distance between the project area and the nearest active nest site. The mitigation ratio varies from 0.5:1 to 1:1 of habitat preserved for each acre lost. If acceptable to ~~DFG~~CDFW, SBFCA also may be able to purchase mitigation credits for Swainson's hawk foraging habitat from a ~~DFG~~CDFW-approved mitigation or conservation bank. Information on the nearest nest will be collected during Swainson's hawk surveys conducted under Mitigation Measure WILD-MM-11~~7~~, discussed above, to determine the appropriate mitigation ratio. If no active nests are found during this survey, a search of the CNDDB will be conducted, and ~~DFG~~CDFW will be contacted to determine the nearest active nest.

Effect WILD-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special Status Birds and Removal of Suitable Breeding Habitat

Special-status birds that may nest in the riparian forest in and adjacent to the study~~affected~~ area include white-tailed kite, bald eagle, western yellow-billed cuckoo, purple martin, and yellow warbler. Bank swallow may nest adjacent to the ~~affected area~~construction area in the banks of the Feather River. Northern harrier may nest in ruderal areas in or adjacent to the construction ~~the affected~~ area. Loggerhead shrike may nest in shrubs and trees in more open portions of the construction~~affected~~ area. Tricolored blackbirds may nest in blackberry brambles or field crops. Numerous non–special status birds also may nest in these areas. Because construction and PG&E facility relocations are~~is~~ anticipated to occur between April 15 and November 30, effects on nesting birds may occur. Vegetation removal and other construction activities during the breeding season (generally February 1 through August 31) could result in the mortality or disturbance of nesting birds in and adjacent to the construction area. The removal of riparian forest, ruderal areas, and field crops would reduce the amount of available nesting habitat for special-status and non–special status birds.

Removal of nest trees during the breeding season or anticipated disturbance that may result in nest abandonment and subsequent loss of eggs or young of bald eagle, western yellow-billed cuckoo, or bank swallow would require an incidental take permit from ~~DFG~~CDFW. Because white-tailed kite is fully protected, removal of trees with active nests and activities that may result in loss of white-tailed kites are prohibited. Removal of nests or suitable nesting habitat (trees, shrubs, ruderal areas, field crops) and construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Such losses could affect the local population of special-status and non–special status species and would be considered a significant effect. Implementation of Mitigation Measure WILD-MM-10~~6~~, and the mitigation measure below, would reduce this effect to a less-than-significant level.

Mitigation Measure WILD-MM-13~~9~~: Conduct Nesting Surveys for Special-Status and Non–Special Status Birds and Implement Protective Measures during Construction

SBFCA will retain qualified wildlife biologists with knowledge of the relevant species to conduct nesting surveys before the start of construction. A minimum of three separate surveys will be conducted between February 1 and June 1. Surveys will include a search of all suitable nesting habitat (trees, shrubs, ruderal areas, field crops) in the construction area. In addition, a 500-foot area around the project area will be surveyed for nesting raptors, and a 50-foot buffer area will be surveyed for other nesting birds. If no active nests are detected during these surveys, no additional measures are required.

To the maximum extent feasible, PG&E will conduct facility relocations outside of the nesting season for birds (generally February 1 through August 31). When this is not possible, a qualified biologist will conduct one or more preactivity surveys for nesting birds within the area to be affected and within the buffer areas as defined above.

If active nests are found in the survey area, no-disturbance buffers will be established around the nest sites to avoid disturbance or destruction of the nest site until the end of the breeding season (approximately September 1) or until a qualified wildlife biologist determines that the young have fledged and moved out of the project area (this date varies by species). The extent of the buffers will be determined by the biologists in coordination with USFWS and ~~DFG~~CDFW and will depend on the level of noise or construction disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species. Larger buffer areas or other protective measures may be required for state-listed species (bald eagle, western yellow-billed cuckoo, or bank swallow) to ensure that mortality does not occur if SBFCA does not obtain an incidental take permit for these species. Because some bird species are difficult to detect (i.e., western yellow-billed cuckoo), measures such as avoiding work adjacent to suitable habitat during the early portion of the breeding season may be required, even if active nests are not found.

Effect WILD-7: Potential Loss or Disturbance of Western Burrowing Owl and Loss of Nesting and Foraging Habitat

Construction and PG&E facility relocations are~~is~~ anticipated to occur during the breeding season of western burrowing owl (March through August). Burrowing owls also could be present year-round. Construction activities (including PG&E facility relocations) and removal of nesting habitat (burrows in ruderal areas and on the edges of agricultural areas) could result in the loss or disturbance of western burrowing owl. Removal of occupied burrows and construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Permanent or temporary loss of foraging or burrow habitat for this species also would result from construction activities. Construction activities could remove, compact, fill, or otherwise impact California ground squirrel burrows along the levee, resulting in potential injury or mortality of western burrowing owl and loss of suitable nesting habitat. Maintenance activities that remove or fill burrows or eliminate ground squirrels would also limit the amount of available nesting habitat for burrowing owl along the levee. Grouting burrows (filling burrows with cement) is not a common maintenance practice currently, and its use is not expected to increase after the proposed project is complete. Nesting burrowing owls are protected under the Federal MBTA and California Fish and Game Code Sections 3503 and 3503.5. Loss of active breeding or wintering

burrows or disturbance of breeding burrows resulting in mortality of young and displacement of adults would be considered a significant effect. Implementation of Mitigation Measures WILD-MM-7 and 10.~~6~~ and the mitigation measures below would reduce this effect to a less-than-significant level.

Mitigation Measure WILD-MM-1~~4~~0: Conduct Surveys for Western Burrowing Owl Prior to Construction and Implement Protective Measures if Found

~~DFG~~CDFW recommends western burrowing owl surveys whenever burrowing owl habitat is present on or within 500 feet of a project site. Breeding season and non-breeding season surveys will be conducted in accordance with ~~DFG~~CDFW's 2012 Staff Report on Burrowing Owl Mitigation (2012 Staff Report) (California Department of Fish and Game 2012c). Breeding season will have four surveys: 1) one survey between February 15 and April 15 and 2) a minimum of three surveys at least three weeks apart between April 15 and July 15, with at least one survey after June 15. Non-breeding season surveys will consist of four surveys spread evenly throughout the non-breeding season (September 1 to January 31).

A survey report will be prepared at the conclusion of surveys for submission to ~~DFG~~CDFW. The report will include, but is not limited to, a description of the proposed project or proposed activity, proposed project start and end dates, and a description of disturbances or other activities occurring onsite or nearby (see Appendix D of the 2012 Staff Report).

If burrowing owls are found during any of the surveys, compensatory mitigation best practices as described below will be used. Because ample lead time is necessary for putting compensation in place, these efforts should begin as soon as possible after presence of burrowing owls is determined.

Regardless of results from the surveys described above, an initial take avoidance (preconstruction) surveys will be conducted no less than 14 days prior to and 24 hours before initiating ground disturbing activities. SBFCA will retain a qualified biologist to conduct preconstruction surveys for active burrows according to methodology in the 2012 Staff Report.

To the maximum extent feasible, PG&E will conduct facility relocations in suitable burrowing owl habitat outside of the burrowing owl nesting season (February 1 through August 31). When this is not possible, a qualified biologist will conduct take avoidance surveys within the area to be affected and within 500 feet of this area where suitable habitat is present no less than 14 days prior to and 24 hours before initiating ground disturbing activities.

Burrowing owls may re-colonize a site after only a few days. As such, subsequent take avoidance surveys will be conducted if a few days pass between project activities. If no burrowing owls are found, no further mitigation is required. If burrowing owls are found, SBFCA and PG&E will use avoidance, minimization measures, monitoring, and reporting of such measures as described in the 2012 Staff Report (Mitigation Methods) and summarized below.

- Do not disturb occupied burrows during the breeding season (February 1–August 31).
- Establish a 250-foot-wide buffer where no construction will occur around occupied burrows unless a qualified biologist determines through non-invasive methods that egg laying and incubation have not begun or that juveniles are foraging independently and are capable of independent survival.
- Avoid affecting burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls.

- Avoid destruction of unoccupied burrows and place visible markers near burrows to ensure they are not collapsed.
- Develop and use a worker awareness program to increase the onsite worker recognition of and commitment to burrowing owl protection.
- Conduct additional take avoidance surveys as described above.
- Conduct ongoing surveillance of the project site for burrowing owls during project activities.
- Minimize effects on burrowing owls and their habitat by using buffer zones, visual screens, and other measures during project activities. Recommended buffer distances in the 2012 Staff Report will be used or site-specific buffers and visual screens will be determined through information collected during site-specific monitoring and consultation with the ~~DFG~~CDFW.

Mitigation Measure WILD-MM-15~~1~~: Compensate for the Loss of Occupied Western Burrowing Owl Habitat

If western burrowing owls have been documented to occupy burrows at the project site in the last 3 years, current scientific literature supports the conclusion that the site should be considered occupied and mitigation is required. The current scientific literature also provides the following best practices. If these best practices cannot be used during and after construction and PG&E facility relocation activities, SBFCA may consult with the ~~DFG~~CDFW to develop effective mitigation alternatives.

1. Where habitat will be temporarily disturbed, restore the disturbed area to pre-project conditions, including soil decompaction and revegetation. Permanent habitat protection may be warranted if there is potential that temporary effects may render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable, depending on the time frame, resulting in reduced survival or abandonment. For the latter potential effect, see the permanent effect measures below.
2. Mitigate for permanent effects on nesting, occupied and satellite burrows and/or burrowing owl habitat such that the habitat acreage, number of affected burrows, and burrowing owls are replaced based on site-specific conditions and an analysis of the factors influencing burrowing owls and burrowing owl population persistence in a particular area.
3. Mitigate for permanent effects on nesting, occupied, and satellite burrows and burrowing owl habitat with (a) permanent conservation of similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) to provide for burrowing owl nesting, foraging, wintering, and dispersal during breeding and non-breeding seasons comparable to or better than that of the affected area, and (b) sufficiently large acreage and presence of fossorial (digging) mammals. The mitigation habitat lands may require enhanced or expanded burrows for breeding, shelter and dispersal opportunity, and removal or control of population stressors. If the mitigation lands are adjacent to the affected burrow site, ensure the nearest neighbor artificial or natural burrow clusters are at least within 690 feet.
4. Permanently protect mitigation land through a conservation easement deeded to a nonprofit conservation organization or public agency with a conservation mission for conserving burrowing owl habitat and prohibiting activities incompatible with burrowing owl use. If the project is within the service area of a ~~DFG~~CDFW-approved burrowing owl

conservation bank, the project proponent may purchase available burrowing owl conservation bank credits.

5. Develop and use a mitigation land management plan to address long-term ecological sustainability and maintenance of the burrowing-owl site (see Appendix D of the 2012 Staff Report). The plan will include a monitor and reporting on the mitigation site.
6. Fund the maintenance and management of mitigation land through the establishment of a long-term funding mechanism such as an endowment.
7. Do not alter or destroy habitat until mitigation lands have been legally secured, and the endowment or other long-term funding mechanism is in place or security is provided.
8. Mitigation lands should be on, adjacent, or near the affected site, if possible, and habitat should support an existing burrowing owl population.
9. When insufficient habitat is on, adjacent, or near project sites where burrowing owls will be excluded, mitigation lands with burrowing owl habitat should be away from the project site. The selection of mitigation lands should then focus on consolidating and enlarging conservation areas outside of urban and planned growth areas within foraging distance of other conserved lands. If mitigation lands are not available adjacent to other conserved lands, increase the mitigation land acreage requirement to ensure a selected site is of sufficient size. Offsite mitigation may not adequately offset the biological and habitat values affected on a one-to-one basis. Consult with the ~~DFG~~CDFW when determining offsite mitigation acreages.
10. Evaluate and select suitable mitigation lands based on a comparison of the habitat attributes of the affected and conserved lands, including but not limited to type and structure of habitat being affected or conserved; burrowing owl density in affected and conserved habitat; and significance of affected or conserved habitat to the species range wide. Mitigate for the highest quality affected burrowing owl habitat first and foremost when identifying mitigation lands, even if a mitigation site is outside of a lead agency's jurisdictional boundary, particularly if the lead agency is a city or special district.
11. Select mitigation lands while taking into account potential human and wildlife conflicts or incompatibility, including human foot and vehicle traffic, predation by cats, loose dogs, urban-adapted wildlife, and incompatible species management.
12. When a burrowing owl population appears to be highly adapted to heavily altered habitats such as golf courses, airports, athletic fields, and business complexes, permanently protecting the land, augmenting the site with artificial burrows, and enhancing and maintaining those areas may help sustain of the on-site burrowing owl population. Maintenance includes the following: reduce vegetation height by grazing or hand mowing, remove trees and shrubs, and prevent excessive human disturbance such as walking, jogging, off-road activities, dog-walking, unleashed pets, and feral animals that chase and prey upon owls (4, 5 and 6 above apply to this mitigation approach).
13. If no other feasible mitigation options are available and a lead agency is willing to establish and oversee a Burrowing Owl Mitigation and Conservation Fund that funds, on a competitive basis, acquisition and permanent habitat conservation, the project proponent may participate in the lead agency's program.

Effect WILD-8: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat

Construction and PG&E facility relocations are~~is~~ anticipated to occur during the maternity season of bats (April 1 through September 15) and beginning of the hibernation period (November 1). The proposed project (and possibly PG&E facility relocations) would result in the loss of trees, which provide suitable roosting habitat (cavities, crevices, furrowed bark, and foliage) for special-status bats (western red bat and pallid bat) and bats for which conservation actions are warranted (hoary bat and silver-haired bat) (Western Bat Working Group 2007). Tree removal/trimming and noise or other construction activities could result in the injury, mortality, or disturbance of roosting bats, if present in cavities, crevices, furrowed bark, or foliage of trees. Because no work on bridges or other structures in the construction~~affected~~ area is expected, effects on bats that may roost on these structures (pallid bat or maternity colonies of non–special status bats) are not anticipated. Mortality of tree-roosting bats during the maternity season or hibernation period that results from tree removal/trimming or other disturbances could affect the local populations of these species and would be considered a significant effect. Implementation of Mitigation Measure WILD-MM-10~~6~~ and the following mitigation measure would lessen effects on western red bat, pallid bat, and other bat species.

Mitigation Measure WILD-MM-1~~62~~: ~~Conduct Preconstruction Surveys~~Identify ~~for~~Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures

If tree removal/trimming cannot be conducted between September 15 and October 30, qualified biologists will examine trees to be removed or trimmed for suitable bat roosting habitat before removal/trimming. High-quality habitat features (large tree cavities, basal hollows, loose or peeling bark, larger snags, palm trees with intact thatch, etc.) will be identified and the area around these features searched for bats and bat sign (guano, culled insect parts, staining, etc.). Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage–roosting bat species. ~~If suitable habitat and/or bat sign is detected, biologists will conduct evening visual emergence surveys of the source habitat feature, from a half hour before sunset to 1–2 hours after sunset for a minimum of two nights within the season that construction will be taking place. Night vision goggles and/or full-spectrum acoustic detectors should be used during emergence surveys to assist in species identification. All emergence surveys will be conducted during favorable weather conditions (calm nights with temperatures conducive to bat activity and no precipitation predicted). Additional p~~Passive monitoring using full spectrum bat detectors may be needed if identification of bat species is required. Survey methods should be discussed with ~~DFG~~CDFW prior to the start of surveys.

~~Avoidance and minimization m~~Measures to avoid and minimize impacts to~~may be necessary if~~ sensitive bats species ~~are detected during surveys and/or acoustic monitoring and~~ will be determined in coordination with ~~DFG~~CDFW and~~. These measures~~ may include th~~e~~ose following.

- Tree removal will be avoided between April 1 and September 15 (the maternity period) to avoid effects on pregnant females and active maternity roosts (whether colonial or solitary).
- All tree removal will be conducted between September 15 and October 30, which corresponds to a time period when bats have not yet entered torpor or would be caring for nonvolant young.
- Trees will be removed in pieces rather than felling an entire tree.

- If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or a qualified biologist has determined the roost is no longer active.
- If avoidance of nonmaternity roost trees is not possible, and tree removal or trimming must occur between October 30 and August 31, qualified biologists will monitor tree trimming/removal. If possible, tree trimming/removal should occur in the late afternoon or evening when it is closer to the time that bats would normally arouse. Prior to removal/trimming, each tree will be shaken gently and several minutes should pass before felling trees or limbs to allow bats time to arouse and leave the tree. The biologists should search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern will be reported to ~~DFG~~CDFW. The biologist will prepare biological monitoring report, which will be provided to the project lead and CDFW.

Effect WILD-9: Potential Injury, Mortality or Disturbance of Ringtail and Removal of Habitat

Levee construction and PG&E facility relocations are anticipated to occur during the ringtail breeding and maternity period (February through August). The proposed project (and possibly PG&E facility relocations) would result in the loss of trees, some of which may provide suitable shelter and denning habitat (hollow trees, logs, snags) for ringtails. The project may also disturb burrows that provide suitable denning habitat. Newborn/young ringtails are especially vulnerable during May through August, when they are unable to leave the maternal den. Removal of suitable shelter or denning habitat, noise, or other construction activities could result in the injury, mortality, or disturbance of ringtails. Mortality of ringtail, a fully protected species, could affect the local population along the Feather River and would be considered a significant effect. Because ringtail is a fully protected species, take of this species is prohibited. Implementation of Mitigation Measure WILD-MM-16 and the following mitigation measure would avoid effects on ringtail.

Mitigation Measure WILD-MM-17: Identify Suitable Shelter and Denning Habitat for Ringtail and Implement Avoidance and Protective Measures

Prior to the start of construction wildlife biologists will survey the area to be impacted for suitable burrows and examine trees to be removed for suitable hollow areas that may provide shelter or denning habitat for ringtail. All hollow trees, snags, downed logs, and appropriately sized burrows that will be removed will be thoroughly examined. If necessary, a ringtail specialist will be contracted to confirm the suitability of habitat and determine if suitable habitat is occupied through the use of remote cameras or other non-invasive methods for determining occupancy. Riparian woodlands and areas adjacent to riparian woodlands should be considered suitable habitat and be searched for appropriate shelter/denning habitat. Survey methods should be discussed with CDFW and/or a ringtail specialist prior to the start of surveys.

Measures to avoid and minimize impacts to ringtail will be determined in coordination with CDFW and may include the following.

- Avoid and/or minimize the removal of suitable burrows, trees, logs and snags that may provide shelter or denning habitat for ringtail.
- Conduct ground disturbing activities and tree removal in riparian habitat with identified potential denning habitat outside of the period when young are unable to leave the denning site (approximately May through August).

- If an active non-maternal den is identified during the survey(s) described above, construction activities within 50 feet of the den will be avoided. If the 50-foot buffer from construction activities cannot be maintained, CDFW must be consulted to determine measures to avoid harming ringtails.
- If an active maternal den is identified, construction activities within 100 feet of the den will be avoided until the young are weaned or until they have relocated to another den site on their own.

Effect WILD-10: Disturbance to or Loss of Common Wildlife Species and Their Habitats

The ~~affected~~biological study area contains both natural and human-influenced habitats that support common invertebrates, amphibians, reptiles, and terrestrial and aquatic mammals (most birds are protected under the MBTA). These non–special status species also could be directly and indirectly affected by project construction. Although they are not afforded the same levels of protection and do not have the same agency consultation requirements under applicable laws, regulations, and policies described in the regulatory section, common species generally would receive some protection from measures prescribed for special-status animals. The resulting effect is considered less than significant, and no mitigation is required.

Effect WILD-1~~0~~1: Potential Disruption of Wildlife Movement Corridors

Terrestrial wildlife species may use the Feather River or the levee as a movement corridor. Additionally, smaller, more localized movement corridors may be present in the 41-mile project area. During construction of levee improvements, movement through the project site would be temporarily impeded by the placement of physical barriers (fencing) used to protect resources within or near the construction footprint. Additionally, animals may avoid movement through the project area or along the Feather River because of the extensive amount of noise and human activity associated with construction. Upon completion of levee improvements, the affected area would have a different footprint but generally would be available as a movement corridor. No permanent barriers would be installed as part of the proposed project. This effect is considered less than significant, and no mitigation is required.

Effect WILD-1~~0~~2~~1~~: Conflict with Provisions of an Adopted HCP/NCCP or other Approved Local, Regional, or State Habitat Conservation Plan

There are no adopted HCP/NCCPs applicable to the proposed project. There are two plans under development in the region: the Yuba-Sutter NCCP/HCP and the Butte Regional Conservation Plan. The proposed project is located in the plan area of both of these conservation plans. Because neither of these plans has been adopted, the proposed project will not conflict with provisions of these plans, and there would be no effect.

Summary of Mitigation Requirements

A summary of the timing of mitigation requirements is provided in Table 3.9-6.

Table 3.9-6. Timing of Mitigation Requirements

Species	Requirement	Timing
Anthicid beetles and tiger beetle	Install fencing to protect potentially suitable habitat	Prior to the start of any construction activities
Valley elderberry longhorn beetle	1) Conduct VELB surveys for shrubs to be transplanted	Prior to November 1 of transplant year
	2~~1~~) Transplant elderberry shrubs	November 1–February 15
	2~~3~~) Install orange barrier fencing around shrubs to be protected.	Prior to the start of any construction activities
	3~~4~~) Compensate for impacts by ~~purchasing mitigation credits or~~ planting elderberries and associated natives onsite (Star Bend Mitigation Area).	~~Mitigation credits must be purchased prior to groundbreaking.~~ Timing of onsite mitigation will be in accordance with the terms and conditions of the ~~would be determined in coordination with~~ USFWS Biological Opinion.
Western pond turtle	Preconstruction survey	One week before and within 24 hours of beginning work during the cooler part of the day (8 a.m. and 12 p.m. during spring and summer)
Giant garter snake	1) Construction activity and relocation of PG&E facilities in giant garter snake aquatic and upland habitat within 200 feet of aquatic habitat	Between May 1 and October 1
	2) Install exclusion fencing and orange barrier fencing along the edge of the construction area that is within 200 feet of suitable habitat	Install on or after May 1
	3) Preconstruction survey	Within 24 hours of the start of construction in or within 200 feet of suitable habitat
	4) Purchase preservation credits equal to 0.20 acre of giant garter snake habitat at a USFWS and CDFW approved conservation bank	Funds must be transferred within 30 days of a purchase and sales agreement, and before any construction activities are initiated
Nesting birds	1) Vegetation removal/trimming	September 1–January 31
	2) Preconstruction Surveys (3)	February 1–June 1
Swainson's hawk	Preconstruction surveys	February through July
Western burrowing owl	Breeding and wintering surveys (8)	Four surveys between February 15 and April 15 and four surveys spread evenly between September 1 and January 31
	Preconstruction surveys (2)	Preconstruction surveys no less than 14 days before and 24 hours before ground disturbance
Bats	1) Tree removal	September 15–October 30
	2) Disturbance of maternity colony	No disturbance until September 15
	3) Monitor tree removal	October 30–August 31

3.9.4.3 Alternative 2

Alternative 2 includes levee improvements used for Alternative 1 (with the exception of clay ditch lining) as well as other measures, including stability berms and relief wells. The measures used for Alternative 2 would extend substantially beyond the current footprint of the Feather River west levee. Implementation of this alternative would potentially result in effects on wildlife resources that are similar or greater than those described for Alternative 1. The magnitude of habitat losses would be greater for some species because the footprint of Alternative 2 is larger. Table 3.9-7 summarizes wildlife effects and mitigation measure requirements for Alternative 2; see Alternative 1 for the text describing the these effects and mitigation measures. Table 3.9-8 provides a summary of the effects on special-status species habitat for Alternative 2.

Table 3.9-7. Wildlife Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-1: Potential Mortality of or Loss of Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle	Significant	WILD-MM-1: ~~Conduct Focused Surveys for~~ Fence and Avoid Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle and Implement Protective Measures	Less than significant
Effect WILD-2: Potential Mortality or Disturbance of VELB and its Habitat (Elderberry Shrubs)	Significant	WILD-MM-2: Conduct VELB Surveys Prior to Elderberry Shrub Transplantation WILD-MM-3: Implement Measures to Protect~~ive Measures and Compensate for Effects on~~ VELB and its Habitat WILD-MM-4: Compensate for Effects on VELB and its Habitat	Less than significant
Effect WILD-3: Potential Mortality or Disturbance of Western Pond Turtle	Significant	WILD-MM-5~~3~~: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed	Less than significant
Effect WILD-4: Potential Disturbance or Mortality of and ~~Temporary~~ Loss of Suitable Habitat for Giant Garter Snake	Significant	WILD-MM-6~~4~~: Avoid and Minimize Effects on Giant Garter Snake WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-MM-8~~5~~: Compensate for Permanent Loss of Suitable Giant Garter Snake Habitat WILD-MM-9: Restore Temporarily Disturbed Giant Garter Snake Aquatic and Upland Habitat to Pre-Project Conditions	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-11~~7~~: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction and Implement Protective Measures during Construction WILD-MM-12~~8~~: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk	Less than significant
Effect WILD-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special Status Birds and Removal of Suitable Breeding Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-13~~90~~: Conduct Nesting Surveys for Special-Status and Non–Special Status Birds and Implement Protective Measures during Construction	Less than significant
Effect WILD-7: Potential Loss or Disturbance of Western Burrowing Owl and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-14~~10~~: Conduct Surveys for Western Burrowing Owl prior to Construction and Implement Protective Measures if Found WILD-MM-15~~11~~: Compensate for the Loss of Occupied Western Burrowing Owl Habitat	Less than significant
Effect WILD-8: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-16~~12~~: ~~Conduct Preconstruction Surveys for~~Identify Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-9: Potential Injury, Mortality or Disturbance of Ringtail and Removal of Habitat	Significant	WILD-MM-17: Identify Suitable Shelter and Denning Habitat for Ringtail and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-10~~9~~: Disturbance to or Loss of Common Wildlife Species and Their Habitats	Less than significant	None required	Less than significant
Effect WILD-11~~0~~: Potential Disruption of Wildlife Movement Corridors	Less than significant	None required	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-121: Conflict with Provisions of an Adopted HCP/NCCP or other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

Table 3.9-8. Effects on Special-Status Species Habitat for Alternative 2

Special-Status Species	Habitat	Permanent/Temporary (acres)
Antioch Dunes anthicid, Sacramento anthicid, and Sacramento Valley tiger beetle	Sandy riparian areas	0/0
Valley elderberry longhorn beetle	Elderberry shrubs	91[1]*
Western pond turtle aquatic habitat	Canals and ditches, ponds and basins, forested/shrub wetland, open water, streams and rivers, tailings wetlands	31.0/0.96
Giant garter snake ~~and western pond turtle~~ aquatic habitat	Drainage ditch, ~~freshwater emergent,~~ irrigation ditch, open water, ponds	2.9/25.49
Giant garter snake upland habitat	Ruderal within 200 feet of aquatic habitat	1.170/149.99
Swainson's hawk, white-tailed kite, bald eagle, western yellow-billed cuckoo, purple martin, yellow warbler, and other birds nesting and foraging habitat, and ringtail	Riparian forest trees and other trees	1,585
Swainson's hawk, white-tailed kite, northern harrier, burrowing owl, and tricolored blackbird foraging habitat	Field and row crops and ruderal	92.03/780.84
Bank swallow	Bluffs and banks of streams/ levees adjacent to water	0/0
Bat roosting habitat	Riparian forest and orchard	693.13/40.85

[1]~~*~~ For valley elderberry longhorn beetle, the effect~~s~~ is the number of elderberry shrubs to be removed~~are given in numbers of shrubs~~, not acres.
[2] This is the number of trees over 4 inches in diameter at breast height that would be removed.

3.9.4.4 Alternative 3

Alternative 3 is a blend of levee improvement measures from Alternatives 1 and 2. Implementation of this alternative would potentially result in effects on wildlife resources similar to those described for Alternative 1. The magnitude of the majority of permanent and temporary habitat losses would be less than Alternatives 1 and 2; however, temporary impacts to foraging habitat for birds would be greater under Alternative 3 ~~temporary losses of habitat would be greater for some land cover types~~ than Alternatives 1 and 2. Table 3.9-9 summarizes wildlife effects and mitigation measure requirements for Alternative 3; see Alternative 1 for the text describing these effects and mitigation measures. Table 3.9-10 summarizes the effects on special-status species habitat for Alternative 3.

Table 3.9-9. Wildlife Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-1: Potential Mortality of or Loss of Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle	Significant	WILD-MM-1: ~~Conduct Focused Surveys for~~Fence and Avoid Habitat for Antioch Dunes Anthicid, Sacramento Anthicid, and Sacramento Valley Tiger Beetle and Implement Protective Measures	Less than significant
Effect WILD-2: Potential Mortality or Disturbance of VELB and its Habitat (Elderberry Shrubs)	Significant	WILD-MM-2: Conduct VELB Surveys Prior to Elderberry Shrub Transplantation WILD-MM-3: Implement Measures to Protect~~ive Measures and Compensate for Effects on~~ VELB and its Habitat WILD-MM-4: Compensate for Effects on VELB and its Habitat	Less than significant
Effect WILD-3: Potential Mortality or Disturbance of Western Pond Turtle	Significant	WILD-MM-5~~3~~: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed	Less than significant
Effect WILD-4: Potential Disturbance or Mortality of and ~~Temporary~~ Loss of Suitable Habitat for Giant Garter Snake	Significant	WILD-MM-6~~4~~: Avoid and Minimize Construction Effects on Giant Garter Snake WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-MM-5~~8~~: Compensate for Loss of Suitable Giant Garter Snake Habitat WILD-MM-9: Restore Temporarily Disturbed Giant Garter Snake Aquatic and Upland Habitat to Pre-Project Conditions	Less than significant
Effect WILD-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-11~~7~~: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction and Implement Protective Measures during Construction WILD-MM-12~~8~~: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk	Less than significant
Effect WILD-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special Status Birds and Removal of Suitable Breeding Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-13~~90~~: Conduct Nesting Surveys for Special-Status and Non–Special Status Birds and Implement Protective Measures during Construction	Less than significant

Effect	Finding	Mitigation Measure	With Mitigation
Effect WILD-7: Potential Loss or Disturbance of Western Burrowing Owl and Loss of Nesting and Foraging Habitat	Significant	WILD-MM-7: Avoid and Minimize Potential Maintenance Impacts on Suitable Habitat for Giant Garter Snake and Western Burrowing Owl WILD-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-14~~10~~: Conduct Surveys for Western Burrowing Owl prior to Construction and Implement Protective Measures if Found WILD-MM-15~~11~~: Compensate for the Loss of Occupied Western Burrowing Owl Habitat	Less than significant
Effect WILD-8: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat	Significant	WILD-MM-10~~6~~: Conduct Vegetation Removal Activities outside the Breeding Season for Birds WILD-MM-16~~12~~: ~~Conduct Preconstruction Surveys for~~Identify Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-9: Potential Injury, Mortality or Disturbance of Ringtail and Removal of Habitat	Significant	WILD-MM-17: Identify Suitable Shelter and Denning Habitat for Ringtail and Implement Avoidance and Protective Measures	Less than significant
Effect WILD-10~~9~~: Disturbance to or Loss of Common Wildlife Species and Their Habitats	Less than significant	None required	Less than significant
Effect WILD-11~~0~~: Potential Disruption of Wildlife Movement Corridors	Less than significant	None required	Less than significant
Effect WILD-12~~1~~: Conflict with Provisions of an Adopted HCP/NCCP or other Approved Local, Regional, or State Habitat Conservation Plan	No effect	None required	No effect

Table 3.9-10. Effects on Special-Status Species Habitat for Alternative 3

Special-Status Species	Habitat	Permanent/Temporary (acres)
Antioch Dunes anthicid, Sacramento anthicid, and Sacramento Valley tiger beetle	Sandy riparian areas	0/0
Valley elderberry longhorn beetle	Elderberry shrubs	91[1]
Western pond turtle aquatic habitat	Canals and ditches, forested/shrub wetland, open water, streams and rivers, tailings wetlands	9.83/0.11
Giant garter snake ~~and western pond turtle~~ aquatic habitat	Canal and ditches, ~~Drainage ditch, freshwater emergent, irrigation ditch,~~ open water, ponds	0.004/6.81
Giant garter snake upland habitat	Ruderal within 200 feet of aquatic habitat	0/118.80
Swainson's hawk, white-tailed kite, bald eagle, western yellow-billed cuckoo, purple martin, yellow warbler, and other birds nesting and foraging habitat, and ringtail	Riparian forest trees and other trees	1,151[2]
Swainson's hawk, white-tailed kite, northern harrier, burrowing owl, and tricolored blackbird foraging habitat	Field and row crops and ruderal	4.75/750.63
Bank swallow	Bluffs and banks of streams/ levees adjacent to water	0/0
Bat roosting habitat	Riparian forest and orchard	124.0/10.36

[1]~~*~~ For valley elderberry longhorn beetle, the effect~~s~~ is the number of elderberry shrubs to be removed ~~are given in numbers of shrubs~~, not acres.

[2] This is the number of trees over 4 inches in diameter at breast height that would be removed.

3.10 Fish and Aquatic Resources

3.10.1 Introduction

This section describes the regulatory and environmental setting for fish and aquatic resources; effects on fish and aquatic resources that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.10.2 Affected Environment

This section describes the affected environment for fish and aquatics in the project area. Following are the key sources of data and information used in the preparation of this section.

- USFWS list of endangered, threatened, and proposed species for Nicolaus, Yuba City, Sutter, Olivehurst, Biggs, Gridley, and Palermo (U.S. Fish and Wildlife Service 2012).
- Published and unpublished reports.
- ICF International file information.

3.10.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to fish and aquatic resources. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to fish and aquatics may apply to implementation of the proposed project.

Endangered Species Act

The ~~Federal Endangered Species Act (~~ESA~~)~~ protects fish and wildlife species and their habitats that have been identified by NMFS or USFWS as threatened or endangered. *Endangered* refers to species, subspecies, or ~~distinct population segments (~~DPSs~~)~~ that are in danger of extinction through all or a significant portion of their range. *Threatened* refers to species, subspecies, or DPSs that are likely to become endangered in the near future.

ESA is administered by USFWS and NMFS. In general, NMFS is responsible for protection of ESA-listed marine species and anadromous fish, and USFWS is responsible for other listed species. Provisions of Sections 9 and 7 of ESA are relevant to this project and are summarized below.

Section 9: ESA Prohibitions

Section 9 of the ESA prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species also is prohibited under Section 9, unless otherwise authorized by

Federal regulations.[1] *Take*, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harm* is defined as "any act that kills or injures the species, including significant habitat modification." In addition, Section 9 prohibits removing, digging up, cutting, and maliciously damaging or destroying federally listed plants on sites under Federal jurisdiction.

Section 7: ESA Authorization Process for Federal Actions

Section 7 of the ESA provides a means for authorizing take of threatened and endangered species by Federal agencies. Under Section 7, the Federal agency conducting, funding, or permitting an action (the lead Federal agency, such as USACE) must consult with NMFS or USFWS, as appropriate, to ensure that the proposed project would not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed project "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a BA to evaluate the nature and severity of the expected effect. In response, NMFS or USFWS issues a BO, with a determination that the proposed project either:

- may jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding), or
- would not jeopardize the continued existence of any listed species (no jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

The BO issued by NMFS or USFWS may stipulate discretionary conservation recommendations. If the project, or any reasonable or prudent alternative, would not jeopardize a listed species, USFWS or NMFS issues an incidental take statement to authorize take associated with the proposed activity or reasonable and prudent alternative. The incidental take statement will include mandatory *reasonable and prudent* measures designed to minimize the impacts of take associated with the project or reasonable and prudent alternative.~~The BO issued by NMFS or USFWS may stipulate discretionary "reasonable and prudent" conservation measures. If the project would not jeopardize a listed species, USFWS or NMFS issues an incidental take statement to authorize the proposed activity.~~

~~USACE and NMFS are in coordination to determine the ESA compliance documentation appropriate for the FRWLP~~The Corps has determined that the proposed project may affect, but is not likely to adversely affect federally listed CV spring-run Chinook salmon ESU (*O. tshawytscha*), Sacramento River winter-run Chinook salmon ESU (*O. tshawytscha*), CCV steelhead DPS (*O. mykiss*), Southern DPS of North American green sturgeon (*Acipenser medirostris*), or their designated critical habitats. In addition, the Corps has determined that the proposed project will not adversely affect EFH of Pacific salmon. A letter from NMFS was received on April 17, 2013 (2013/9542) concurring with the Corps determination concluding ESA section 7 consultation for the proposed project.

Below is the list of measures included in the NMFS concurrence letter that will be implemented to protect the federally listed species. The second column provides a reference to the section of the document or the mitigation measure where further information on the measure can be found.

[1] In some cases, exceptions may be made for threatened species under ESA Section 4(d); in such cases, USFWS or NMFS issues a 4(d) rule describing protections for the threatened species and specifying the circumstances under which take is allowed.

(1)	Construction personnel will receive worker environmental awareness training. This training will instruct workers to recognize sensitive species and their habitats.	VEG-MM-3
(2)	Erosion control BMPs and a SWPPP will be implemented to address and minimize water quality issues	Section 2.4.12
(3)	Where suitable habitat is present for listed species, SBFCA will clearly delineate the construction limits through the use of survey tape, pin flags, orange barrier fencing, or other means, and prohibit any construction-related traffic outside these boundaries.	VEG-MM-2
(4)	If a sensitive species is encountered by a biological monitor during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the species will not be harmed.	Section 2.4
(5)	Implementation of a spill prevention, control, and countermeasure plan and bentonite slurry spill contingency plan is anticipated to minimize the potential for toxic or hazardous spills or discharges into the Feather River.	Sections 2.4.13 and 2.4.14
(6)	To prevent possible resource damage from hazardous materials such as motor oil or gasoline, construction personnel will not service vehicles or construction equipment outside designated staging areas unless it is done offsite.	VEG-MM-3
(7)	The biological monitor will record all observations of federally listed species on California Natural Diversity Database field sheets and submit to the Corps, NMFS, USFWS, and CDFW.	Section 3.9
(8)	Because ground disturbance for the proposed project will be greater than one acre, SBFCA will obtain coverage under the U.S. Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System general construction activity stormwater permit.	Section 2.4.12
(9)	The specific BMPs that will be incorporated into the erosion and sediment control plan and SWPPP will be site-specific and will be prepared by the construction contractor in accordance with the California Regional Water Quality Control Board Field Manual.	Section 2.4.12
(10)	Compensation for permanent and temporary losses of woody riparian vegetation will be achieved through a combination of onsite and offsite compensation. To the extent feasible, SBFCA proposed to conduct onsite compensation in floodplain areas within the proposed project footprint or in the proposed project vicinity. SBFCA proposes to conduct offsite compensation for riparian impacts in the existing 48.5-acre Star Bend Conservation Area, located within the setback area adjacent to the west levee of the Feather River, approximately 6 miles south of Yuba City.	Appendix F (Part F.3)
(11)	SBFCA prepared and MMP for compensation of riparian impacts with the goal of ensuring no net loss of habitat functions and values. The MMP has been submitted to the agencies for review and approval. The MMP identifies the compensation ratios and describes how riparian habitat will be restored, monitored, and reported upon over a specified period of time.	Appendix F (Part F.3)
(12)	To help ensure that there is limited temporal habitat damage to riparian habitat, the mitigation project will be implemented during the fall of 2013.	Appendix F (Part F.3)

Critical Habitat

Critical habitat, as defined in ESA Section 3, is:

I. the specific area within the geographic area occupied by a species, at the time it is listed in accordance with ESA, on which are found those biological features

   i. essential to the conservation of the species, and

   ii. may require special management considerations or protection; and

II. specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Floodplain connectivity is recognized as contributing to critical habitat. Aquatic habitats in the study area have been designated as critical habitat for the following species (also see discussion on 3.10-7 under *Special-Status Species*).

- Central Valley spring-run Chinook salmon.
- Central Valley steelhead.
- Green sturgeon.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act requires consultation with USFWS, NMFS, and the state fish and wildlife agencies where the waters of any stream or other body of water are proposed, authorized, permitted, or licensed to be impounded, diverted, or otherwise controlled or modified under a Federal permit or license. Consultation ~~is in progress~~ for the purpose of preventing loss of and damage to wildlife resources, has been led by USFWS in coordination with NMFS and ~~DFG~~CDFW. More information on this Act can be found in Appendix A (Section A.1.8), as well as a discussion in Chapter 5. The USFWS issued the Coordination Act Report on May 8, 2013, found in Appendix F.4 ~~More complete text for this act is included in Appendix A, as well as a discussion in Chapter 5~~.

Magnuson-Stevens Fishery Conservation and Management Act

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

Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must also be considered. The Magnuson-Stevens Act states that consultation regarding essential fish habitat should be consolidated, where appropriate, with the interagency consultation, coordination, and environmental review procedures required by other Federal statutes, such as NEPA, Fish and Wildlife Coordination Act, CWA, and ESA. EFH consultation requirements can be satisfied through concurrent environmental compliance if the lead agency

provides NMFS with timely notification of actions that may adversely affect EFH and if the notification meets requirements for essential fish habitat assessments.

USACE and NMFS ~~are in coordination to determine~~have ~~the~~concluded the EFH compliance ~~documentation appropriate for the FRWLP~~requirements with the receipt of the concurrence letter received from NMFS on April 17, 2013.

State

The following state policies related to fish and aquatics may apply to implementation of the proposed project.

California Endangered Species Act

The CESA, which is administered by ~~DFG~~CDFW, protects wildlife and plants listed by the California Fish and Game Commission as threatened and endangered under the act. CESA prohibits all persons from taking species that are state-listed as threatened or endangered except under certain circumstances; the CESA definition of *take* is any action or attempt to "hunt, pursue, catch, capture, or kill."

CESA Section 2081 provides a means by which agencies or individuals may obtain authorization for incidental take of state-listed species, except for certain species designated as fully protected under the California Fish and Game Code. Take must be incidental to, and not the purpose of, an otherwise lawful activity. Requirements for a Section 2081 permit are similar to those used in the ESA Section 7 process. They include identification of effects on listed species, development of mitigation measures that minimize and fully mitigate effects, development of a monitoring plan, and assurance of funding to implement mitigation and monitoring.

California Fish and Game Code Section 1600: Streambed Alteration Agreements

~~DFG~~CDFW has jurisdictional authority over wetland resources associated with rivers, streams, and lakes under Sections 1600–1607. ~~DFG~~CDFW has the authority to regulate all work under the jurisdiction of the State of California that would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed.

In practice, ~~DFG~~CDFW marks its jurisdictional limit at the top of the stream or lake bank, or the outer edge of the riparian vegetation where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries, as defined by CWA Section 404, sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under Section 1600 may encompass a greater area than those regulated under CWA Section 404.

~~DFG~~CDFW enters into a streambed alteration agreement with an applicant and can impose conditions on the agreement to ensure that no net loss of wetland values or acreage would be incurred. The streambed or lakebed alteration agreement is not a permit, but a mutual agreement between ~~DFG~~CDFW and the applicant.

Local

Sutter and Butte Counties have each adopted policies related to fish and wildlife resources, as detailed in Appendix A.

3.10.2.2 Environmental Setting

The following considerations are relevant to fish and aquatic resources in the project area.

Study Area

The study area generally includes more than 40 miles of the Feather River's western bank from south of the Thermalito Afterbay to the Sutter Bypass. The study area spans the project footprint, which includes the maximum extent of all alternatives.

Fish Species in the Study Area

The various water bodies in the study area provide spawning, rearing, and migratory habitat for a diverse assemblage of native and nonnative fish species (Table 3.10-1). Native species present in these streams can be separated into anadromous (species that spawn in fresh water after migrating as adults from marine habitat) and resident species. Native anadromous species include two runs of Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*O. mykiss*), green and white sturgeon (*Acipenser medirostris* and *A. transmontanus*), Pacific lamprey (*Entosphenus tridentata*), and river lamprey (*Lampetra ayresi*). Native resident species include Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Sacramento sucker (*Catostomus occidentalis*), hardhead (*Mylopharodon conocephalus*), California roach (*Hesperoleucas symmetricus*), and rainbow trout (*O. mykiss*). Nonnative anadromous species include striped bass (*Morone saxatilis*) and American shad (*Alosa sapidissima*). Nonnative resident species include largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), white and black crappie (*Pomoxis annularis* and *P. nigromaculatus*), channel catfish (*Ictalurus punctatus*), white catfish (*Ameiurus catus*), brown bullhead (*Ictalurus nebulosus*), bluegill (*Lepomis macrochirus*), green sunfish (*L. cyanellus*), and golden shiner (*Notemigonus crysaleucas*).

Table 3.10-1. Representative Central Valley Fish Assemblage Likely to Be Present in the Feather River Study Area

Common Name—Origin	Scientific Name
Pacific lamprey—native	*Entosphenus tridentata*
River lamprey—native	*Lampetra ayresi*
Chinook salmon (spring-, fall-/late fall–runs)—native	*Oncorhynchus tshawytscha*
Steelhead/rainbow trout—native	*Oncorhynchus mykiss*
White sturgeon—native	*Acipenser transmontanus*
Green sturgeon—native	*Acipenser medirostris*
Wakasagi—nonnative	*Hypomesus nipponensis*
Sacramento sucker—native	*Catostomus occidentalis*
Sacramento pikeminnow—native	*Ptychocheilus grandis*
Sacramento splittail—native	*Pogonichthys macrolepidotus*
Sacramento blackfish—native	*Orthodon microlepidotus*
Hardhead—native	*Mylopharodon conocephalus*

Common Name—Origin	Scientific Name
Speckled dace—native	*Rhinichthys osculus*
California roach—native	*Hesperoleucas symmetricus*
Hitch—native	*Lavina exilicauda*
Golden shiner—nonnative	*Notemigonus crysoleucas*
Fathead minnow—nonnative	*Pimephales promelas*
Goldfish—nonnative	*Carassius auratus*
Common carp—nonnative	*Cyprinus carpio*
Threadfin shad—nonnative	*Dorosoma petenense*
American shad—nonnative	*Alosa sapidissima*
Black bullhead—nonnative	*Ictalurus melas*
Brown bullhead—nonnative	*Ictalurus nebulosus*
White catfish—nonnative	*Ictalurus catus*
Channel catfish—nonnative	*Ictalurus punctatus*
Mosquitofish—nonnative	*Gambusia affinis/G. holbrooki*
Inland silverside—nonnative	*Menidia beryllina*
Threespine stickleback—native	*Gasterosteus aculaetus*
Striped bass—nonnative	*Morone saxatilis*
Bluegill—nonnative	*Lepomis macrochirus*
Green sunfish—nonnative	*Lepomis cyanellus*
Redear sunfish—nonnative	*Lepomis microlophus*
Warmouth—nonnative	*Lepomis gulosus*
White crappie—nonnative	*Pomoxis annularis*
Black crappie—nonnative	*Pomoxis nigromaculatus*
Largemouth bass—nonnative	*Micropterus salmoides*
Redeye bass—nonnative	*Micropterus coosae*
Spotted bass—nonnative	*Micropterus punctulatus*
Smallmouth bass—nonnative	*Micropterus dolomieui*
Bigscale logperch—nonnative	*Percina macrolepida*
Prickly sculpin—native	*Cottus asper*
Riffle sculpin—native	*Cottus gulosus*
Tule perch—native	*Hysterocarpus traski*

Sources: Moyle 2002; California Department of Water Resources 2007; Seesholtz et al. 2004.

Special-Status Fish Species

Special-status fish species that occur or have the potential to occur in or near the study area, as well as their status in the study area, are presented in Table 3.10-2. Critical habitat for spring-run Chinook salmon and Central Valley steelhead falls within the study area in the Feather River. In addition, the Feather River is designated critical habitat for green sturgeon (74 FR 52345 October 9, 2009). While the Feather River is not designated critical habitat for winter-run Chinook salmon, effects on this species were considered as they have the potential to occur in the study area for at least part of their life-cycle.

Table 3.10-2. Special-Status Fish Species with Potential to Occur in the Study Area

Common and Scientific Name	Status[a] Federal/State	California Distribution	Habitats	Occurrence in the Study Area
Sacramento splittail *Pogonichthys macrolepidotus*	–/SSC	Occurs throughout the year in low-salinity waters and freshwater areas of the Sacramento–San Joaquin Delta, Yolo Bypass, Suisun Marsh, Napa River, and Petaluma River (Moyle 2002).	Spawning takes place among submerged and flooded vegetation in sloughs and the lower reaches of rivers.	High
Central Valley steelhead *Oncorhynchus mykiss*	T/–	Sacramento River and tributary Central Valley rivers	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18°C (Moyle 2002). Habitat types are riffles, runs, and pools.	High—spawning during migration
Sacramento River winter-run Chinook salmon *Oncorhynchus tshawytscha*	E/E	Mainstem Sacramento River below Keswick Dam (Moyle 2002)	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Habitat types are riffles, runs, and pools (Moyle 2002).	Low–Medium—juveniles may occur in study area during rearing and emigration (see text on page 3.10-10)
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	T/T	Upper Sacramento River and Feather River	Has the same general habitat requirements as winter-run Chinook salmon. Coldwater pools are needed for holding adults (Moyle 2002).	High—spawning during migration
Central Valley fall-/late fall–run Chinook salmon *Oncorhynchus tshawytscha*	SC/SSC	Sacramento and San Joaquin Rivers and tributary Central Valley rivers	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Habitat types are riffles, runs, and pools (Moyle 2002).	High—spawning during migration
Green sturgeon (southern DPS[b]) *Acipenser medirostris*	T/SSC	Sacramento, Klamath, and Trinity Rivers (Moyle 2002)	Spawns in large river systems with well-oxygenated water, with temperatures from 8.0 to 14°C.	Low
River lamprey *Lampetra ayresi*	–/SSC	Sacramento, San Joaquin, and Napa Rivers; tributaries of San Francisco Bay (Moyle 2002; Moyle et al. 1995)	Adults live in the ocean and migrate into fresh water to spawn.	High—spawning during migration

Common and Scientific Name	Status[a] Federal/State	California Distribution	Habitats	Occurrence in the Study Area
Hardhead *Mylopharodon conocephalus*	–/SSC	Tributary streams in the San Joaquin drainage; large tributary streams in the Sacramento River and the mainstem	Reside in low to mid-elevation streams and prefer clear, deep pools and runs with slow velocities. Also occur in reservoirs.	High

[a] Species Definitions

Federal

E = endangered under the Federal Endangered Species Act.
T = threatened under the Federal Endangered Species Act.
SC = species of concern.
– = no listing.

State

E = endangered under the California Endangered Species Act.
T = threatened under the California Endangered Species Act.
SSC = species of special concern.
– = no listing.

[b] DPS = distinct population segment.

Chinook Salmon

Chinook salmon are anadromous fish, meaning that adults live in marine environments and return to their natal freshwater streams to spawn. Juveniles rear in freshwater for a period of up to 1 year until smoltification (a physiological preparation for survival in marine environs) and subsequent ocean residence.

Four distinct runs of Chinook salmon occur in the Feather River system: winter-run, spring-run, fall-run, and late fall–run. The runs are named after the season of adult migration, with each run having a distinct combination of adult migration, spawning, juvenile residency, and smolt migration periods. In general, fall- and late fall–run Chinook salmon spawn soon after entering their natal streams, while spring-run Chinook salmon typically hold in their natal streams for up to several months before spawning.

Winter-Run

The Sacramento River winter-run Chinook salmon is listed as an endangered species under the ESA and CESA. Critical habitat for winter-run Chinook salmon includes the Sacramento River from Keswick Dam (RM 302) to Chipps Island (RM 0) in the Delta, and all waters of the San Francisco estuary to the Golden Gate Bridge north of the San Francisco/Oakland Bay Bridge (58 FR 33212). Critical habitat includes the water column, bottom, and adjacent riparian zone of the designated stream reaches (limited to streambank and nearshore areas used as cover and foraging habitat by juveniles) and the water column, foraging habitat, and food resources used by juvenile and adult winter-run Chinook salmon in the estuary.

Historically, winter-run Chinook salmon spawned in cold tributary streams upstream of present-day Shasta Reservoir, including the Little Sacramento, Pit, McCloud, and Fall Rivers and Battle Creek. Presently, winter-run Chinook salmon persist in the Sacramento River below Keswick Dam and are sustained by coldwater releases from Shasta Reservoir.

Adult winter-run Chinook salmon immigration (upstream migration) through the Delta and into the Sacramento River occurs from December through July (Table 3.10-3), with a peak in March. Winter-run Chinook salmon spawn primarily in the Sacramento River between Keswick Dam (RM 302) and Red Bluff Diversion Dam (RM 242) from mid-April to mid-August, with peak spawning occurring in May and June (National Marine Fisheries Service 2009).

Juvenile emigration (downstream migration) past the Red Bluff Diversion Dam (RM 242) may begin as early as mid-July and extend through March, with a peak in September (National Marine Fisheries Service 2009) (Table 3.10-3). The primary period of juvenile emigration through the lower Sacramento River into the Delta is November through early May, with a peak occurring between January and April (National Marine Fisheries Service 1997). Although winter-run Chinook salmon do not spawn in the Feather River, juveniles emigrating down the Sacramento River are reported to enter and rear in non-natal tributaries (Maslin et al. 1999) and thus may enter the Feather River during their downstream emigration period (November through March) (Table 3.10-3).

Spring-Run

The Central Valley spring-run Chinook salmon evolutionarily significant unit (ESU), which includes populations spawning in the Sacramento River and its tributaries, including the Feather River, as well as the Feather River Hatchery spring-run Chinook program. They are listed as threatened under

ESA and CESA. Critical habitat is designated for spring-run Chinook salmon in the Feather River (70 FR 52598 September 2, 2005).

Spring-run Chinook salmon historically occurred from the upper tributaries of the Sacramento River to the upper tributaries of the San Joaquin River. However, they have been extirpated from the San Joaquin River system. The only streams in the Central Valley with remaining wild spring-run Chinook salmon populations are the Sacramento River and its tributaries, including the Yuba River, Mill Creek, Deer Creek, and Butte Creek.

Spring-run Chinook salmon enter the Sacramento River from late March through September (Reynolds et al. 1993), but peak abundance of immigrating adults in the Delta and lower Sacramento River occurs from April through June (Table 3.10-3). From the Sacramento River, adult Central Valley spring-run Chinook salmon enter native tributaries primarily between mid-April and mid-June (National Marine Fisheries Service 2006). Based on run-time observations of spring-run Chinook salmon in the Feather River, adults are likely to be present in the project area during the upstream migration period between February and July. During this period, adults are assumed to migrate actively through the project area to summer holding habitat in the Low Flow Channel below Oroville Dam. Adult spring-run Chinook salmon remain in deepwater habitats downstream of spawning areas during summer until their eggs fully develop and become ready for spawning. This is the primary characteristic that distinguishes spring-run Chinook salmon from the other runs.

Results from Feather River Chinook salmon emigration studies indicate that most juvenile Chinook salmon (both spring- and fall-run) emigrate soon after emergence at sizes less than 50 mm in length (Seesholtz et al. 2004). Emigration typically begins in mid-November, peaks between January and March, and continues through June (Table 3.10-3) (Seesholtz et al. 2004). Therefore, rearing and emigrating juveniles are likely present in the project area from mid-November through June, with the greatest abundance of individuals in January, February, and March. Little information is available on Chinook salmon emigration in the lowermost portion of the lower Feather River, but most juveniles probably have emigrated from the river by mid-May in response to physiological cues and rising water temperatures.

Fall- and Late Fall–Run

Central Valley fall-run and late fall–run Chinook salmon are commercially and recreationally important. These ESUs are Federal species of concern. Because the fall-run Chinook salmon is currently the largest run of Chinook salmon in the Sacramento River system, it continues to support commercial and recreational fisheries of significant economic importance.

All Central Valley streams that had adequate flows in the fall, even if they were intermittent during the summer, probably supported fall-run Chinook salmon. Unlike spring-run Chinook salmon that migrated to higher-elevation streams, fall-run Chinook salmon likely were limited to streams of the valley floor and lower foothill reaches because of their egg-laden and generally deteriorated physical condition.

In general, adult fall-run Chinook salmon migrate into the Sacramento River and its tributaries from July through December, with immigration peaking from mid-October through November (Table 3.10-3). Fall-run Chinook salmon spawn in numerous tributaries of the Sacramento River, including the lower American River, lower Yuba River, Feather River, and tributaries of the upper Sacramento River. Spawning generally occurs from October through December, with fry emergence typically beginning in late December and January (Table 3.10-3). Fall-run Chinook salmon emigrate

as post-emergent fry, juveniles, and smolts after rearing in their natal streams for up to 6 months. Consequently, fall-run emigrants may be present in the lower Sacramento River from December through June (Reynolds et al. 1993) (Table 3.10-3) and remain in the Delta for variable lengths of time before ocean entry.

Adult immigration of late fall–run Chinook salmon into the Sacramento River generally begins in October, peaks in December, and ends in April (Moyle et al. 1995) (Table 3.10-3). Primary spawning areas for late fall–run Chinook salmon are located in tributaries of the upper Sacramento River (e.g., Battle Creek, Cottonwood Creek, Clear Creek, Mill Creek), although late fall–run Chinook salmon are believed to return to the Feather and Yuba Rivers as well (Moyle et al. 1995). Spawning occurs generally from January through April (Moyle et al. 1995). Juveniles emigrate through the lower Feather River primarily from October through April (Table 3.10-3).

Central Valley Steelhead

Central Valley steelhead is listed as threatened under the ESA. The Feather River Hatchery produces steelhead that are included as part of the listed steelhead population (74 FR 834 January 5, 2006). Critical habitat is designated for steelhead in the Feather River (70 FR 52614 September 2, 2005). Steelhead, an anadromous variant of rainbow trout, is closely related to Pacific salmon. The species was once abundant in California coastal and Central Valley drainages. However, population numbers have declined significantly in recent years, especially in the tributaries of the Sacramento River. Steelhead typically migrate to marine waters after spending 1 year or more in fresh water. In the marine environment, they typically mature for 1 to 3 years before returning to their natal streams to spawn as 3- or 4-year-olds. Unlike Pacific salmon, steelhead are capable of spawning more than once before they die. Immigration of adult steelhead in the Sacramento River occurs in nearly all months but peaks in late September and October (Moyle 2002). The steelhead spawning season typically stretches from December through April (Table 3.10-3). After several months, fry emerge from the gravel and begin to feed. Juveniles rear in fresh water from 1 to 4 years (usually 2 years), then migrate to the ocean as smolts in the spring (March through June).

Sacramento Splittail

Sacramento splittail is a California species of special concern. Sacramento splittail is an endemic California minnow that once was widely distributed in lakes and rivers throughout the Central Valley, including the Sacramento River upstream to Redding and the American River as far east as Folsom (Moyle 2002). Present distribution includes Suisun Bay, the Napa and Petaluma Rivers (Sommer et al. 1997), the Sacramento River as far north as the Red Bluff Diversion Dam, portions of the Delta, and the San Joaquin River upstream of its confluence with the Tuolumne River (Moyle 2002). In the Feather River, Sacramento splittail were found as far upstream as Oroville (Moyle et al. 2003).

Adult splittail usually reach sexual maturity in their second year. They then migrate upstream in late fall to early winter before spawning. Spawning occurs from mid-winter through July in water temperatures between 48°F and 68°F (Wang 1986) at times of high winter or spring runoff (Moyle et al. 1995). Eggs acquire adhesive properties following exposure to water and adhere to vegetation or other benthic substrates (Wang 1986). Fertilized eggs generally hatch in 3 to 5 days, and larvae begin feeding on plankton soon thereafter. Juvenile splittail inhabit shallow areas with abundant vegetation that are devoid of strong currents (Wang 1986) as they travel downstream from the spawning grounds to the Delta.

Mature splittail generally are found in the shallows of sloughs in edgewater habitat by emergent vegetation. They feed primarily on benthic invertebrates and aquatic insect larvae (Moyle 2002). Although they are tolerant of brackish water (Moyle 2002), splittail tend to move from areas of relatively high salinity to those characterized by fresh water (Moyle et al. 1995).

There have been incidental observations of splittail in the Feather River, but no detailed studies to determine population numbers. It is thought that splittail use the lower Feather River from February through May for spawning, egg incubation, and initial rearing during years when shallow flooded vegetation is inundated. Spawning splittail are infrequently observed in the lower Feather River from the confluence with the Sacramento River up to Honcut Creek. The majority of spawning activity in the lower Feather River is thought to occur below the Yuba River confluence and occurs in greatest abundance in the Sutter Bypass during high-flow events (California Department of Water Resources 2007).

Hardhead

Hardhead are a California species of concern. Hardhead are found in undisturbed, low- to mid-elevation streams with summer water temperatures greater than 68°F (20°C). They are common in the Sacramento River and lower mainstems of the American and Feather Rivers. Adults typically move upstream into tributaries to spawn primarily in April and May (Moyle 2002). Spawning behavior is not well-documented, but it is thought that fertilized eggs are deposited on beds of gravel in riffles, runs, or the heads of pools. While little is known about the early life history of hardhead, it is thought that young hardhead use shallow stream edges and/or backwater habitat with aquatic vegetation along perimeters of shallow pools as cover, and once they grow larger, move into deeper habitats (Moyle 2002).

Hardhead are resident year-round; therefore, all life stages are present in the Feather River. Hardhead frequently are observed in the Feather River from the Fish Barrier Dam downstream to the confluence with the Sacramento River (Moyle 2002).

Green Sturgeon

NMFS has divided sturgeon into two DPSs: the southern DPS and northern DPS. The northern DPS comprises sturgeon from the Eel River northward; the southern DPS comprises populations below the Eel, specifically the Sacramento River population (71 FR 17757). The southern DPS, which occurs in the study area, is federally listed as threatened (71 FR 17757, April 7, 2006). NMFS designated critical habitat for green sturgeon in the Feather River, which includes the project area (74 FR 52300 October 2009).

Green sturgeon are known to occur in the lower reaches of large rivers, including the Klamath, Eel, and Smith Rivers, from the Delta northward (Moyle 2002). Green sturgeon also have been found in saltwater from Ensenada, Mexico, to the Bering Sea and Japan (Miller and Lea 1972). Adults of this species tend to be associated with marine environments more than the more common white sturgeon, although spawning populations have been identified in the Sacramento and Klamath Rivers (Beak Consultants 1993). Spawning has been confirmed in only three rivers, the Rogue River in Oregon, and the Klamath and Sacramento Rivers in California (National Marine Fisheries Service 2008). Green sturgeon may spawn in the Feather River during high-flow years (California Department of Fish and Game 2002), but sightings to confirm this have not been documented. Historical use of the Feather River, prior to construction of Oroville Dam, is unknown. Historical and current records confirm the presence of adult green sturgeon in the Feather River (Beamesderfer et

al. 2004; Seesholtz pers. comm.). In 2008, one adult was detected by a fixed telemetry monitor at Star Bend in May, and another adult was sighted in early June at Shanghai Bend (Seesholtz pers. comm.). In 2006, a dozen sturgeon, of which four were green sturgeon, were observed near the Thermalito Outlet on the Feather River (Seesholtz pers. comm.).

River Lamprey

River lamprey is a state species of special concern. River lamprey are relatively small (averaging 6.7 inches long) and highly predaceous (Moyle 2002). They are anadromous and will attack fish in both fresh and saltwater (Moyle 2002). A great deal of what is known about the species is based on populations in British Columbia. River lamprey adults are likely to occur in the project area during upstream movements to spawning areas in September through May (Table 3.10-3). It is unlikely that spawning would occur in the immediate project area based on reported spawning preferences (gravelly riffles in small tributaries). Adults excavate a saucer-shaped depression in sand or gravel riffles and deposit eggs. After spawning, the adults perish. Juvenile river lampreys, called ammocoetes, remain in backwaters for several years where they feed on algae and microorganisms (Moyle et al. 1986). The metamorphosis from juvenile to adult begins in July and is complete by the following April. From May through July, following completion of metamorphosis, river lamprey aggregate in the Delta before entering the ocean.

River lamprey is distributed in streams and rivers along the eastern Pacific Ocean from Juneau, Alaska, to San Francisco Bay. They may be most abundant in the Sacramento and San Joaquin River systems, although they are observed only rarely (Moyle et al. 1986).

Table 3.10-3. Life Stage Timing and Distribution of Selected Species Potentially Affected by the Feather River West Levee Project

Species/Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Spring-Run Chinook Salmon													
Adult migration	San Francisco Bay to Feather River and Tributaries			■	■	■	■	■	■	■			
Adult spawning	Upper Sacramento River, lower Yuba and Feather Rivers									■	■		
Juvenile movement	Feather River and Tributaries to San Francisco Bay	■	■	■	■	■	■					■	■
Winter-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to upper Sacramento River	■	■	■	■	■	■	■					■
Juvenile rearing (natal stream)	Upper Sacramento River to San Francisco Bay	■	■	■								■	■
Juvenile movement and rearing	Feather River to San Francisco Bay	■	■	■				■	■	■	■	■	■
Late Fall–Run Chinook Salmon													
Adult migration	San Francisco Bay to Upper Sacramento River and Tributaries	■	■	■	■						■	■	■
Adult spawning	Feather River	■	■	■	■								

Species/Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Juvenile movement and rearing	Upper Sacramento River and Tributaries	■	■	■	■						■	■	■
Fall-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to Upper Sacramento River and Tributaries							■	■	■	■	■	■
Adult spawning	Feather River										■	■	■
Juvenile movement and rearing	Upper Sacramento River and Tributaries to San Francisco Bay	■	■	■	■	■	■						■
Steelhead													
Adult migration	San Francisco Bay to Upper Sacramento River and Feather River	■	■	■									■
Adult spawning	Upper Sacramento River, lower Yuba and Feather Rivers	■	■	■	■								■
Juvenile and smolt movement	Upper Sacramento River and Feather River to San Francisco Bay			■	■	■	■						
Green Sturgeon													
Adult migration and holding	San Francisco Bay to Upper Sacramento River		■	■	■	■	■						
Juvenile rearing (natal stream to estuary)	Upper Sacramento River to San Francisco Bay	■	■	■	■	■	■	■	■	■	■	■	■
Juvenile movement and rearing	Upper Sacramento River to San Francisco Bay					■	■	■	■				
Splittail													
Adult migration and holding	San Francisco Bay to Upper Sacramento River					■	■	■	■				
Juvenile rearing	Upper Sacramento River to San Francisco Bay					■	■	■	■				
Juvenile movement and rearing	Upper Sacramento River to San Francisco Bay					■	■	■	■				
Hardhead													
Adult spawning	Feather River				■	■							
Juvenile rearing	Feather River	■	■	■	■	■	■	■	■	■	■	■	■
River Lamprey													
Adult migration and spawning	Pacific Ocean to Feather River	■	■	■	■	■				■	■	■	■
Metamorphosis and movement	Feather River to Delta		■	■	■	■				■	■	■	

Sources: Wang and Brown 1993; U.S. Fish and Wildlife Service 1996; McEwan 2001; Moyle 2002; Hallock 1989; Beamesderfer et al. 2006; California Department of Water Resources 2007.

Note: Primary occurrence included in the assessment of project effects.

Factors that Affect Abundance of Fish Species

Information relating abundance with environmental conditions is most available for listed species, especially Chinook salmon. The following section focuses on factors that potentially have affected the abundance of listed species in the Central Valley. Although not all species are discussed, factors affecting the listed species are assumed to affect the abundance of other native and nonnative species in similar fashion.

Aquatic Habitat

All of the information included below was taken from Foothill Associates (2010) Lower Feather River HUC/Honcut Creek Watershed Existing Conditions Assessment.

Between the Thermalito Afterbay Outlet and Verona (where the Feather River meets the Sacramento River), about 10% of the river is riprapped. Although the majority of the river is controlled by levees, only about 5% of the levees are directly adjacent to the active channel. Levees severely constrict the floodplain along the upper portion of this reach. Much of the reach has been mined for gravel, resulting in many pits, multiple channel areas, and somewhat jumbled floodplain topography.

Historically, seasonal flooding covered basins throughout the Central Valley and provided important spawning and rearing habitat for many fish species, including Sacramento splittail and juvenile Chinook salmon. Levee construction has reduced the overall amount of seasonal flooding and shallow-water habitat in the Feather River system. In winter, however, some agricultural fields are allowed to flood during high flows (e.g., Butte Basin, Sutter Bypass) and are used by splittail for spawning and rearing, and by Chinook salmon for rearing.

Floodplain Habitat

Recognition is growing that naturally functioning floodplains provide many benefits, including direct economic benefits, ecosystem services, and habitat for a wide diversity of species (Bayley 1991; Tockner and Stanford 2002, as cited in Ahearn et al. 2006). Floodplains provide freshwater habitat for the migration, reproduction, and rearing of native fishes (Moyle et al. 2003; Crain et al. 2004) and mitigate flood damage to human settlements (Sommer et al. 2001a).

Floodplains are highly productive habitats that flood during high flows in the winter and spring. Floodplains are important habitats for young fish, especially Chinook salmon and splittail (Moyle et al. 2005). Chinook salmon, which spawn in freshwater rivers and streams upstream of the Delta, use inundated floodplain habitats (when available) for rearing. Chinook salmon growth has been shown to be faster in floodplain habitat than in river systems (Sommer et al. 2001b). Sacramento splittail, which spawn in inundated floodplains, produce the highest numbers of young when flows are high and floodplain habitat is inundated (Moyle 2002).

Some floodplain habitat on the Feather River has been converted to agricultural land for irrigated crops and orchards (California Department of Water Resources 2007). Floodplain habitat is still present on the Feather River and provides habitat for Chinook salmon and splittail when inundated during high winter and spring flows.

Nearshore and Shaded Riverine Aquatic Habitat

Nearshore areas support large and diverse fish and wildlife populations. These areas are important to fish for rearing and migration because they create attachment sites for aquatic insects (a food source for fish) and provide fish with shelter from predators. For example, juvenile Chinook salmon and steelhead rely on nearshore habitats as fry, smolt, or yearlings and to some extent as adults. In addition, vegetated nearshore habitat can provide spawning areas for some fish species, such as splittail, black bass, and sunfish.

Shaded riverine aquatic (SRA) cover provides important riverine fish habitat along the water bodies in the study area. SRA cover is defined as the nearshore aquatic habitat occurring at the interface between a river and adjacent woody riparian habitat (U.S. Fish and Wildlife Service 1992). The principal attributes of this cover type are: (1) an adjacent bank composed of natural, eroding substrates supporting riparian vegetation that either overhangs or protrudes into the water; and (2) water that contains variable amounts of woody debris, such as leaves, logs, branches, and roots, and has variable depths, velocities, and currents. The quantity and quality of SRA cover for fish are primary determinants of habitat availability and suitability in streams. The occurrence of many aquatic species, including juvenile salmonids, depends on the size, density, and continuity of suitable nearshore cover.

Riparian vegetation is a component of nearshore and SRA cover and directly influences the quality of fish habitat. Its presence has an effect on cover, food, instream habitat complexity, streambank stability, and temperature regulation. Instream woody material (IWM) usually originates from riparian trees and provides habitat complexity in aquatic environments, an essential component of fish habitat. The roots of riparian vegetation at the land-water interface and on adjacent berms provide streambank stability and cover for rearing fish (Meehan and Bjorn 1991).

Riparian vegetation also provides shade and an insulating canopy that moderates water temperatures in both summer and winter. While the influence of shade on regulating river temperatures decreases as rivers become larger, the moderating effects of shade on nearshore water temperatures may be important to some fish species, including juvenile salmonids, during the growing season.

Riparian vegetation also influences the food chain of a stream, providing organic detritus and terrestrial insects. Terrestrial organisms falling from overhanging branches contribute to the food base of the aquatic community. Salmonids in particular are primarily insectivores and feed mainly on drifting food organisms. Areas of riparian floodplain on the Feather River have been converted to irrigated crops and orchards (California Department of Water Resources 2007). However, there are areas of riparian vegetation on the Feather River that provide large woody debris and organic detritus and terrestrial insects for fish.

Spawning Habitat

Spawning habitat area may limit the production of juveniles and subsequent adult abundance of some species. Spawning habitat area for fall- and late fall–run Chinook salmon, which compose more than 90% of the Chinook salmon returning to the Central Valley streams, has been identified as limiting their population abundance. Existing spawning habitat area has not been identified as a limiting factor for the less-abundant winter-run and spring-run Chinook salmon (National Marine Fisheries Service 1996; U.S. Fish and Wildlife Service 1996), although habitat may be limiting in some streams (e.g., Butte Creek) during years of high adult abundance.

A lack of sufficient seasonally flooded vegetation may limit splittail spawning success (Young and Cech 1996; Sommer et al. 1997). Splittail spawn over flooded vegetation and debris on floodplains inundated by high flows from February to early July in the Sacramento River and San Joaquin River systems. The onset of spawning appears to be associated with rising water levels, increasing water temperature, and day length (Moyle 2002). The Sutter and Yolo Bypasses along the Sacramento River are important spawning habitat areas during high flow.

The Feather River provides both warmwater and coldwater spawning habitat for native and sport fish. The upper section of the lower Feather River is managed for coldwater fish (salmonids), and the downstream extent of the lower Feather River is suitable for warmwater spawning. Approximately two thirds of the natural Chinook salmon spawning occurs between the Fish Barrier Dam and the Thermalito Afterbay Outlet (RM 67–59), and one third of the spawning occurs between the Thermalito Afterbay Outlet and Honcut Creek (RM 59–44). Most natural steelhead spawning occurs in the low-flow channel near Hatchery Ditch, a side channel located between RM 66 and RM 67. Some steelhead spawning also occurs below Thermalito Afterbay Outlet (California Department of Water Resources 2007).

Rearing Habitat

Rearing habitat area may limit the production of juveniles and subsequent adult abundance of some species. USFWS (1996) indicates rearing habitat area in Central Valley streams and rivers limits the abundance of juvenile fall-run and late fall–run Chinook salmon and juvenile steelhead. Rearing habitat for salmonids is defined by environmental conditions such as water temperature, DO, turbidity, substrate, water velocity, water depth, and cover (Jackson 1992; Bjornn and Reiser 1991; Healey 1991). Chinook salmon also rear along the shallow vegetated edges of Delta channels (Grimaldo et al. 2000).

Environmental conditions and interactions among individuals, predators, competitors, and food sources determine habitat quantity and quality and the productivity of the stream (Bjornn and Reiser 1991). Everest and Chapman (1972) found juvenile Chinook salmon and steelhead of the same size using similar in-channel rearing area.

Rearing area varies with flow. High flow increases the area available to juvenile Chinook salmon because they extensively use submerged terrestrial vegetation on the channel edge and the floodplain. Deeper inundation provides more overhead cover and protection from avian and terrestrial predators than shallow water. In broad, low-gradient rivers, change in flow can greatly increase or decrease the lateral area available to juvenile Chinook salmon, particularly in riffles and shallow glides (Jackson 1992).

Rearing habitat has not been identified as a limiting factor in splittail population abundance, but as with spawning, a lack of sufficient seasonally flooded vegetation may be limiting population abundance and distribution (Young and Cech 1996). Rearing habitat for splittail encompasses the Delta, Suisun Bay, Suisun Marsh, the lower Napa River, the lower Petaluma River, and other parts of San Francisco Bay (Moyle 2002). In Suisun Marsh, splittail concentrate in the dead-end sloughs that have small streams feeding into them (Daniels and Moyle 1983; Moyle 2002). As splittail grow, salinity tolerance increases (Young and Cech 1996). Splittail are able to tolerate salinity concentrations as high as 29 ppt and as low as 0 ppt (Moyle 2002).

Rearing habitat for all fish species discussed above is available in the Feather River (California Department of Water Resources 2007).

Migration Habitat

The Feather River and the Delta provide a migration pathway between freshwater and ocean habitats for adult and juvenile steelhead and all runs of Chinook salmon.

Migration habitat conditions include streamflows that provide suitable water velocities and depths that provide successful passage. Flow in the Feather River and in the Delta provides the necessary depth, velocity, and water temperature; however, flow and environmental conditions in the Central Valley are not always at optimal levels (e.g., see discussion below for water temperature).

Adult splittail gradually move upstream during the winter and spring months to spawn. Year-class success of splittail is positively correlated with wet years, high Delta outflow, and floodplain inundation (Sommer et al. 1997; Moyle 2002). Low flow impedes access to floodplain areas that support rearing and spawning.

Water Temperature

Fish species have different responses to water temperature conditions depending on their physiological adaptations. Salmonids in general have evolved under conditions in which water temperatures need to be relatively cool. Splittail can tolerate warmer temperatures. In addition to species-specific thresholds, different life stages have different water temperature requirements. Eggs and larval fish are the most sensitive to warm water temperature.

Unsuitable water temperatures for adult salmonids such as Chinook salmon and steelhead during upstream migration lead to delayed migration and the potential for lower reproduction rates. Elevated summer water temperatures in holding areas cause mortality of spring-run Chinook salmon (U.S. Fish and Wildlife Service 1996). Warm water temperature and low ~~dissolved oxygen (~~DO~~)~~ concentrations also increase egg and fry mortality. USFWS (1996) cited elevated water temperatures as limiting factors for fall- and late fall–run Chinook salmon.

Juvenile salmonid survival, growth, and vulnerability to disease are affected by water temperature. In addition, water temperature affects prey species abundance and predator occurrence and activity. Juvenile salmonids alter their behavior depending on water temperature, including movement to take advantage of local water temperature refugia (e.g., movement into stratified pools, shaded habitat, subsurface flow) and improve feeding efficiency (e.g., movement into riffles).

Water temperature in Central Valley rivers frequently exceeds the tolerance of Chinook salmon and steelhead life stages. For example, adult fall-run Chinook salmon have been observed to stop their upstream migration when water temperatures exceed 66°F (Hallock et al. 1970). For Chinook salmon eggs and larvae, survival during incubation is assumed to decline with increasing temperature between 54°F and 61°F (Myrick and Cech 2001). For juvenile Chinook salmon, survival is assumed to decline as temperature warms from 64°F to 75°F (Myrick and Cech 2001; Rich 1987). Relative to rearing, Chinook salmon require cooler temperatures to complete the parr-smolt transformation and maximize their saltwater survival. Successful smolt transformation is assumed to deteriorate at temperatures ranging from 63°F to 73°F (Baker et al. 1995).

For steelhead, successful adult migration and holding are assumed to deteriorate as water temperature warms between 52°F and 70°F. Adult steelhead appear to be much more sensitive to thermal extremes than are juveniles (National Marine Fisheries Service 1996; McCullough 1999). Conditions supporting steelhead spawning and incubation are assumed to deteriorate as temperature warms between 52°F and 59°F (Myrick and Cech 2001). Juvenile rearing success is

assumed to deteriorate at water temperatures ranging from 63°F to 77°F (Raleigh et al. 1984; Myrick and Cech 2001). Relative to rearing, smolt transformation requires cooler temperatures, and successful transformation occurs at temperatures ranging from 43°F to 50°F. Juvenile steelhead, however, have been captured at Chipps Island in June and July at water temperatures exceeding 68°F (Nobriga and Cadrett 2001). Juvenile Chinook salmon also have been observed to migrate at water temperatures warmer than expected based on laboratory experimental results (Baker et al. 1995).

Splittail populations are adapted to water temperature conditions in the Delta. Splittail may withstand temperatures as warm as 91°F but prefer temperatures between 66°F and 75°F (Young and Cech 1996).

Water temperatures in the lower Feather River below the Thermalito Afterbay Outlet in the spring, summer, and fall can be increased by releases from Thermalito Afterbay. The amount of water temperature increase in the lower Feather River below the Thermalito Afterbay Outlet is affected by ambient air temperatures, the proportion of flows released from the afterbay in comparison to flows in the low-flow channel, and the duration of residence time of water in the afterbay (California Department of Water Resources 2007). Water temperatures may be too warm for pre-spawning adult salmonids and rearing salmonids.

Entrainment

All fish species are entrained to varying degrees by the ~~State Water Project (~~SWP~~)~~ and Central Valley Project (CVP) Delta export facilities and many other smaller diversions in Central Valley rivers. Entrainment of juvenile fish by unscreened or poorly screened diversions is one factor in degradation of rearing and migrating habitat (National Marine Fisheries Service 2009). Fish entrainment and subsequent mortality are highly variable among species and may be a function of the size of the diversion, the location of the diversion, the behavior of the fish (Swanson et al. 2004, 2005), and other factors, such as fish screens, the presence of predatory species, and water temperature. Diversions that divert relatively little water from the total channel and with low approach velocities are assumed to minimize stress and protect fish from entrainment.

Young-of-year splittail are entrained between April and August when fish are moving downstream into the estuary (Moyle 2002). Juvenile Chinook salmon are entrained in all months but primarily from November through June when juveniles are migrating downstream.

Contaminants

In the Sacramento and San Joaquin River basins, industrial and municipal discharge and agricultural runoff transport contaminants into rivers and streams that ultimately flow into the Delta. Principal pollutants in the Delta are agricultural chemicals and their derivatives (Herbold et al. 1992). Organophosphate insecticides, such as carbofuran, chlorpyrifos, and diazinon, are present throughout the Central Valley and dispersed in agricultural and urban runoff. The “first-flush” storm event or the “dormant spray” storm event is of most concern because of the higher concentration of contaminants in the runoff. In particular, diazinon and chlorpyrifos are applied to control wood-boring insects in dormant stone fruit orchards from December to February (Zamora et al. 2003). These contaminants enter rivers in winter runoff and enter the estuary in concentrations that can be toxic to invertebrates (CALFED Bay-Delta Program 2000). Unlike severe bioaccumulators such as organochlorine pesticides, organophosphate pesticides typically are metabolized by most invertebrates. However, some organophosphate pesticides do bioaccumulate, and some do not

bioaccumulate. In particular, diazinon has a solubility of 68.9 mg/L (at 68°F) but should not bioaccumulate in aquatic organisms (Zamora et al. 2003). Chlorpyrifos, on the other hand, is more persistent in the environment and tends to be hydrophobic to the water column. Chlorpyrifos has a lower solubility than diazinon (1.12 mg/L at 75°F) and has a significant potential to bioaccumulate in aquatic organisms (Zamora et al. 2003). Because some organophosphates may accumulate in living organisms, they may become toxic to fish species, especially those life stages that remain in the system year-round and spend considerable time there during the early stages of development, such as Chinook salmon, steelhead, splittail, and green sturgeon.

Mercury contamination from historical mining activities is extensive on both sides of the Central Valley and occurs primarily from widely scattered hydraulic mining debris along eastside tributaries and active and abandoned mines and associated debris piles on the west side. These sources continue to deposit significant amounts of mercury into the Bay-Delta system. The Cosumnes River, Yolo Bypass, and Sacramento River are the primary ongoing sources of mercury contamination in the Bay-Delta. Mercury occurs in several forms, including pure elemental mercury and toxic methylmercury. Mercury is mobile in aquatic systems as aqueous mercury or when attached to suspended particulate matter. Methylmercury is a significant water quality concern because small amounts can bioaccumulate in fish to levels that are toxic to humans and wildlife. In the Delta, mercury concentrations in bluegill, Sacramento sucker, and largemouth bass have been found to exceed the human health standard of 0.5 ~~part per million (~~ppm~~)~~ by two to six times (Slotten 1991).

Other contaminants of particular concern in the Bay-Delta system include high concentrations of trace elements such as selenium, copper, cadmium, and chromium; however, their effects on higher trophic levels are poorly understood, in part as a result of the complex distribution of high concentrations in both time and space (Herbold et al. 1992). In general, it appears that the highest concentrations occur in areas where human activity adjacent to the bay is the highest. Although these trace elements occur naturally, concentrations of these trace elements have been found to be high enough to adversely affect the growth and reproduction of aquatic animals in laboratory experiments (Herbold et al. 1992).

In the Feather River, historical gold mining practices, as well as the development of municipal and industrial land uses in the upper watershed and along the lower Feather River, continue to be the primary sources for most of the metals found in the river. Pesticides used to control mosquitoes and herbicides are applied for routine and ongoing maintenance of recreational and other facilities (California Department of Water Resources 2007).

Predation

Nonnative species cause substantial predation mortality on native species. Although the predation contribution to mortality is uncertain, the estimated mortality suggests that striped bass and other predatory fish, primarily nonnative, pose a threat to juvenile Chinook salmon moving downstream, especially where the stream channel has been altered from natural conditions. Turbulence from water passing over dams and other structures may disorient juvenile Chinook salmon and steelhead, increasing their vulnerability to predators. Predators such as striped bass, largemouth bass, and catfish also prey on splittail (U.S. Fish and Wildlife Service 1996).

On the Feather River, water temperatures are a limiting factor in determining species composition, and predator species in the low-flow channel are low (Seesholtz et al. 2003). In the high-flow channel below the Thermalito Afterbay Outlet, predatory species are more numerous and probably contribute to predation on juvenile salmonids (California Department of Water Resources 2005).

Food

Food availability and type affect survival of fish species. Introduction of nonnative food organisms may have an effect on special-status fish species' survival. Nonnative zooplankton species are more difficult for small striped bass to capture, increasing the likelihood of larval starvation (Moyle 2002). Splittail feed on opossum shrimp, which in turn feed on native copepods that have shown reduced abundance, potentially because of the introduction of nonnative zooplankton and the Asiatic clam (*Potamorcorbula amurensis)*. In addition, flow affects the abundance of food in rivers, the Delta, and Suisun Bay. In general, higher flows result in higher productivity, including a higher input of nutrients from channel margins and floodplain inundation, and higher production when low salinity occurs in the shallows of Suisun Bay. Higher productivity increases the availability of prey organisms for fish species.

In the Feather River, macroinvertebrate diversity was consistent with expectations for large rivers in the Sacramento–San Joaquin River watershed. Plankton was not limiting downstream of Oroville Dam, and the macroinvertebrate community in the sampling stations included taxa that are important prey species for fish in the river (California Department of Water Resources 2005).

3.10.3 Environmental Consequences

This section describes the environmental consequences relating to fish for the proposed project. It describes the methods used to determine the effects of the action and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the action, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.10.3.1 Assessment Methods

To prepare for the analysis of the potential effects of the proposed project on fish species, fish biologists reviewed existing resource information related to the study area to evaluate whether sensitive habitats and special-status fish species are known from or could occur in the study area. The information reviewed included the following sources.

- USFWS list of endangered, threatened, and proposed species for the Nicolaus, Yuba City, Sutter, Olivehurst, Biggs, Gridley, Palermo quads (U.S. Fish and Wildlife Service 2012).
- Published and unpublished documents and reports pertaining to the study area.

Construction activities near or in water can cause a range of short- and long-term effects on fish and aquatic resources. Short-term effects are those associated with construction-related activities that typically are limited to the immediate project area and duration of construction. The assessment methods for evaluating potential short-term, construction-related effects in the project area considered construction timing; physical habitat disturbance; potential for physical injury, hazardous spills, turbidity, sedimentation, and erosion resulting from short-term changes in habitat conditions; and the lifestage periodicity and habitat use by species of primary management concern. Long-term effects are those that result in adverse changes to habitat variables that reduce the suitability of fish habitat over a long time period.

Overall, potential effects on fish and aquatic resources were qualitatively assessed by identifying key effect mechanisms associated with construction activities, including the proximity to the Feather

River, and evaluating the risk of those effects to harm fish or aquatic resources. Effects assessment methods rely on an understanding of potential effect mechanisms, general construction activities and timing, and a detailed understanding of species habitat use and life history characteristics. The potential effect mechanisms associated with construction activities that could occur under the project alternatives and evaluated as part of this effects assessment are described below.

Erosion, Sedimentation, and Turbidity

Ground-disturbing activities, such as grading and excavation, and vegetation removal can result in large areas of exposed soils that are susceptible to erosion. Increased erosion could increase sedimentation and siltation, resulting in increased turbidity in the Feather River, adjacent to the project footprint area. Construction-related increases in sedimentation and siltation above background condition potentially could affect listed anadromous fish and their habitat by reducing egg and alevin (juveniles still relying on the yolk sac for energy) survival, interfering with feeding activities, causing breakdown of social organization, and reducing primary and secondary productivity. The magnitude of potential effects on fish would depend on the timing and extent of sediment loading and flow in the stream before, during, and immediately following construction. Therefore, the effects assessment considers each of the aforementioned factors to evaluate qualitatively whether the project alternatives would change conditions in the Feather River as a result of increased erosion, sedimentation, and turbidity.

Hazardous Materials and Chemical Spills

Use and storage of hazardous materials and chemicals (e.g., diesel fuel, lubricants, uncured concrete) near waterways potentially could impair water quality if chemicals or other construction materials are spilled or enter waterways. In general, construction-related chemical spills could affect fish by increasing physiological stress, reducing biodiversity, altering primary and secondary production, and possibly causing direct mortality (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1998). Therefore, the effects assessment qualitatively evaluates the potential for hazardous materials and chemical spills to alter aquatic habitat conditions in the Feather River.

Habitat Modification

Long-term effects of levee repair and bank protection projects on aquatic habitat include loss or degradation of SRA cover, including physical alteration of bank slope, substrate, and instream and overhead cover. Therefore, the potential for significant effects on fisheries resources was based on an assessment of the degree to which the project would affect these key habitat attributes in nearshore and seasonal inundation areas of the Feather River. Analyzing seasonal inundation areas involves understanding the relationships between the characteristics that define the floodplain, such as topography, vegetative cover, water surface elevation, depth, duration, and frequency of hydrologic events. Analysis of effects on woody vegetation relative to OHWM is the primary method for determining effects on critical habitat. OHWM is described in Section 3-8, *Vegetation and Wetlands*.

Hydrostatic Pressure Waves, Noise, and Vibration

In-water construction activities would not occur associated with any of the action alternatives evaluated in this EIS/EIR. Therefore, the potential for hydrostatic pressure waves, noise, and vibration to affect fish is relatively small. However, installation of sheet piles along proposed levee

segments would involve equipment and activities that could produce subsurface pressure waves that could reach the Feather River and potentially affect fish and aquatic resources. These waves could result in underwater noise and vibration, thereby temporarily altering in-river conditions compared to background conditions.

Of particular concern is the noise associated with pile driving that can cause sharp and dramatic hydrostatic pressure waves and vibration that can adversely affect all life stages of fish over relatively long distances (Washington et al. 1992). Hydrostatic pressure waves potentially could rupture the swim bladders and other internal organs of all life stages of fish in the immediate construction area (Bonneville Power Administration 2002; Jones & Stokes Associates 2001; Washington et al. 1992). Additionally, noise and vibration generated by pile driving activities potentially could have sublethal effects on individual fish by inciting movement into lower quality habitats (Bonneville Power Administration 2002). There is evidence that lethal effects can occur from pile driving, but accurately analyzing and addressing these effects, as well as sublethal effects (e.g., injury, temporary hearing threshold shifts, stress, behavioral disturbance), is complicated by several factors. Sound levels and particle motion produced from pile driving can vary depending on pile type, pile size, substrate composition, and type of equipment used. Also, the effects of underwater noise vary among species as a function of species morphology and species physiology. Further, Oriard (1985) and Jones & Stokes Associates (2001) noted that the effects of energy resulting from blasting in rock adjacent to waterways differs depending on the composition and slope of the bank and specifically is reduced relative to in-water blasting. Presumably, pile driving activities on land result in similar reductions in energy transfer to waterways, and thus would result in lesser effects than in-river pile driving activities. Therefore, the effects assessment qualitatively evaluates whether the project alternatives would be anticipated to change conditions in the Feather River as a result of hydrostatic pressure waves and increased noise and vibration caused by construction along the levee footprint.

~~**Predation Risk**~~

~~Proposed construction activities may increase river turbidity, reduce habitat suitability, and cause disorientation, which in turn, could affect normal fish behavior. Deviation from normal behavior, associated with increased turbidity, reportedly increases the risk of predation (DeVore et al. 1980; Birtwell et al. 1984). However, it also has been reported that increased turbidity potentially could decrease predation on fish. In a study conducted in the Fraser River, it was found that juvenile Pacific salmon were less likely to encounter and be consumed by piscivorous (fish-eating) fish predators in turbid waters relative to clear waters (Gregory and Levings 1998). The effects assessment qualitatively evaluates whether the project alternatives would alter habitat conditions in the Feather River that potentially could increase the risk of predation.~~

3.10.3.2 Determination of Effects

The purpose of this assessment is to determine whether the proposed project effects on fish and aquatic resources are significant. Criteria defining significant effects under CEQA are provided in Mandatory Findings of Significance in Section 15065(a)(1) of the State CEQA Guidelines. This section of the State CEQA Guidelines related to fish and wildlife resources states that a project may have a significant effect on the environment if:

> …the project has the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-

sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare, or threatened species…

Consistent with this guidance, effects on fish and aquatic habitat are broadly defined as significant for this analysis if the project would contribute to any of the following effects in the study area.

- Degradation in the quantity or suitability of aquatic habitat of sufficient magnitude and/or duration to reduce the population levels of species of primary management concern.
- Loss of existing riparian habitat, especially that occurring below OHWM.
- Increase in predation of substantial magnitude and/or frequency to reduce the population levels of fish species in the Feather River.
- Interference with the movement of any resident or migratory fish species.
- Substantial long- or short-term loss of habitat quality or quantity.
- Substantial adverse effects on rare or endangered species, candidate species, other special-status species, or habitat of the species.

To further characterize effects on specific habitat parameters, qualitative thresholds (Table 3.10-4) were used to assess how individual effect mechanisms may contribute to the overall project effect.

Table 3.10-4. Construction-Related Impact Indicators

Impact Mechanism	Indicator Value
Shaded riverine aquatic habitat quantity and quality	Loss of existing shaded riverine aquatic habitat value, acreage, and riverside length resulting in habitat modification or degradation in the form of a reduction in physical habitat availability or habitat constituent element suitability for a species to substantially affect this species, relative to the basis of comparison.
Erosion, sedimentation, and turbidity	Increase in erosion, sedimentation, and turbidity resulting in habitat modification or degradation in the form of a reduction in physical habitat availability or habitat constituent element suitability for a species to substantially affect this species, relative to the basis of comparison.
Potential hazardous materials and chemical spills	Potential hazardous materials and chemical spills resulting in habitat modification or degradation in the form of a reduction in physical habitat availability or habitat constituent element suitability for a species to substantially affect this species, relative to the basis of comparison.
Hydrostatic pressure waves, noise, and vibration	Hydrostatic pressure waves, noise, and vibration resulting in habitat modification or degradation in the form of a reduction in physical habitat availability or habitat constituent element suitability for a species to substantially affect this species, relative to the basis of comparison.
Predation risk	Increase in predation of a species to substantially affect this species, relative to the basis of comparison.

3.10.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning fish and aquatic resources are summarized in Table 3.10-5.

Table 3.10-5. Summary of Effects on Fish and Aquatic Resources

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)	Less than significant	None required	Less than significant
Effect FISH-2: Construction-Related Erosion Resulting in Substantially Increased Sedimentation and Turbidity	Less than significant	None required	Less than significant
Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities	Less than significant	None required	Less than significant
Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration	Less than Significant	None required	Less than Significant

3.10.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, and there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions.

No construction-related release of contaminants would occur, and no noise and disturbance effects on special-status fish species or construction-related loss of habitat for special-status fish species would occur.

Because no levee improvements would be made under the No Action Alternative, the risk that the Feather River west levee could fail because of under-seepage, slope stability, or geometry issues would continue. Failure of the Feather River west levee, depending on the magnitude of the event, could cause catastrophic flooding.

A catastrophic levee failure could result in the displacement of fish into flooded areas and the potential for stranding and mortality. In addition, adverse water quality effects could result from the release of hazardous materials during a flood event, which could lead to stress and direct mortality of fish that could adversely affect migration, spawning, and rearing habitat of fish species in the Feather River and adjacent water bodies. Emergency clean-up and earth-moving activities also could result in an increase in sediment and turbidity and the release of hazardous materials into the Feather River and adjacent waterways that could adversely affect migration, spawning, or rearing habitat or result in direct mortality of special- status fish species. Depending on the magnitude of the flood, emergency clean-up activities could last for days, weeks, or even months. If a flood occurred in late winter, clean-up activities could last into the spring, a critical time for migration, movement, and rearing of spring-run Chinook salmon, steelhead, and green sturgeon. Given the unpredictable nature of emergency clean-up activities, is it likely that implementation of BMPs and measures to reduce effects on fish would not be possible. All of these effects would be considered significant. Furthermore, if levees along the Feather River were to collapse, important SRA habitat would be lost. Restoration of this critical habitat could require decades. All of these effects would be considered significant; however, given the uncertainty of the occurrence or magnitude of such an event, potential effects on fish cannot be quantified based on available information.

As presented in Chapter 2, removal of vegetation on the land side and waterside of the levees could occur at varying levels depending on which No Action scenario is implemented. Estimates of the total acres of riparian vegetation losses are presented in Section 3.8, *Vegetation and Wetlands*.

Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)

Loss of riparian and SRA cover resulting from removal of riparian vegetation and IWM along the shoreline of a river can adversely affect aquatic organisms and their habitat. Riparian vegetation serves important functions in stream ecosystems by providing shade, sediment storage, nutrient inputs, channel and streambank stability, habitat diversity, and cover and shelter for fish (Murphy and Meehan 1991). Shoreline areas are particularly important to juvenile salmonids and other native fishes that depend on such habitat for shelter from fast currents, protection from predators, and favorable feeding and growth conditions relative to open-water habitat. Riparian vegetation also acts to moderate stream temperatures. The effect of riparian vegetation on stream temperatures is greatest on small streams and decreases with increasing stream size. Because of the large size of the Feather River relative to its existing shoreline canopy, the effect of riparian vegetation in moderating water temperatures is minor compared with the effects of reservoir operations, discharge, and meteorological conditions (National Marine Fisheries Service 2006).

Although existing SRA cover values are relatively low along much of the existing levee, moderate- to high-quality SRA cover is present in some areas where dense riparian vegetation and IWM occurs below OHWM. The vegetation loss associated with full application of the USACE levee vegetation policy would be about 1,164 trees on the waterside of the levee, of the approximately 2,000 total trees that are non-compliant. These trees would be considered a loss of riparian habitat and the effect would be considered significant and unavoidable at least in the short term, but may be mitigated to a less-than-significant level over the long term with compensatory habitat. Under modified application of the USACE levee vegetation policy, the effect would be considered less than significant because there would not be a substantial temporal loss and because much of the existing riparian and SRA cover below the OHWM within the project area would remain intact.

3.10.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on fish and aquatic resources. These potential effects and related mitigation measure requirements are summarized in Table 3.10-6 and discussed below.

Table 3.10-6. Fish and Aquatic Resources Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including (Critical Habitat)	Less than significant	None required	Less than significant
Effect FISH-2: Construction-Related Erosion Resulting in Substantially Increased Sedimentation and Turbidity	Less than significant	None required	Less than significant
Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities	Less than significant	None required	Less than significant
Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration	Less than Significant	None required	Less than Significant

Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)

Alternative 1 construction activities are assumed to be limited to removal of riparian vegetation only within the construction footprint, and no additional removal would be required in application of the USACE levee vegetation policy. An estimate of the total ~~acreage~~ number of riparian ~~vegetation~~ trees on the waterside of the levee to be removed under Alternative 1 is provided in Section 3.8, *Vegetation and Wetlands*, Table 3.8-6.

As discussed under the No Action Alternative, the removal of riparian vegetation and IWM adversely affects the quantity and quality of shoreline habitat available to juvenile salmonids and other native fishes. However, there are no construction activities proposed in-river or below OHWM; all activities that would result in physical disturbance and removal of vegetation on the waterside slope of the levee would be limited to areas above OHWM. Therefore, no physical modification of critical habitat for ESA-listed fish species would be expected because all proposed construction activities would occur above the OHWM of the Feather River. However, there would be effects on floodplain riparian habitat that may affect listed fish species. For the purposes of NEPA and CEQA, the effect on fisheries resources would be less than significant.

Effect FISH-2: Construction-Related Erosion Resulting in Sedimentation and Turbidity

Construction of cutoff walls, seepage berms, and slope reconstruction of levee sections; depression infill; and ditch lining—and associated clearing and grubbing of vegetation—has the potential to cause soil erosion and contribute sediment to the Feather River. Depending on the level of exposure, suspended sediment can cause lethal, sublethal, and behavioral effects in fish (Newcombe and Jensen 1996). For salmonids, elevated suspended sediment (turbidity) has been linked to a number of behavioral and physiological responses (gill flaring, coughing, avoidance, and increase in blood sugar levels) that indicate some level of stress (Bisson and Bilby 1982; Sigler et al. 1984; Berg and Northcote 1985; Servizi and Martens 1992). Most of these studies observed chronic turbidity levels rather than the brief spikes that are likely under the proposed project. Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35 to 150 ~~nephelometric turbidity units [~~NTUs~~]~~) accelerate foraging rates among juvenile Chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect). The effects would be most acute directly below the construction work area and would decrease with distance downstream as suspended sediment settles out of the water column. Juvenile salmonids tend to avoid highly turbid waters (Bisson and Bilby 1982) and fish near the project area may move laterally or downstream to avoid suspended sediments (Lloyd 1987; Servizi and Martens 1992).

Increases in turbidity and suspended sediment during construction can affect adult and juvenile salmonids by displacing them from preferred habitat. Migrating adults have been reported to avoid high silt loads or cease migration when avoidance is not possible (Cordone and Kelley 1961, as cited by Bjornn and Reiser 1991). Bell (1986) cited a study in which adult salmon did not move in streams where the sediment concentration exceeded 4,000 mg/L (as a result of a landslide). Juveniles tend to avoid streams that are chronically turbid (Lloyd 1987) or move laterally or downstream to avoid turbidity plumes (Sigler et al. 1984). Juvenile coho salmon have been reported to avoid turbidities exceeding 70 NTU (Bisson and Bilby 1982) and cease territorial behavior when exposed to a pulse of turbidity of 60 NTU (Berg 1982). Displacement of juveniles from preferred habitat may reduce growth and survival of juveniles by affecting feeding success or increasing their susceptibility to predation.

Laboratory studies have demonstrated that chronic or prolonged exposure to high turbidity and suspended sediment levels can lead to reduced growth rates. For example, Sigler and coauthors (1984) found that juvenile coho salmon and steelhead trout exhibited reduced growth rates and higher emigration rates in turbid water (25–50 NTU) compared to clear water. Reduced growth rates generally have been attributed to an inability of fish to effectively feed in turbid water (Waters 1995). Chronic exposure to high turbidity and suspended sediment also may affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Waters 1995). High suspended-sediment concentrations also can indirectly affect feeding and growth by burying stream substrates and degrading the quality of the substrate for aquatic invertebrates, an important food source for juvenile salmonids and other fishes.

Based on observations during levee repair activities at project sites on the Sacramento River, construction activities are expected to result in periodic turbidity levels that exceed 25–75 NTUs (National Marine Fisheries Service 2006). These areas likely would be defined by turbidity plumes that may extend along the shoreline up to 1,000 feet downstream from construction activities. The magnitude and duration of exposure would be well below levels associated with injury or reduced growth of juvenile salmonids but would be expected to temporarily disrupt normal feeding, sheltering, and migratory behavior. Some individuals may respond by moving away from protective cover, increasing their susceptibility to predation. Other species may be affected in similar ways, although their tolerance levels vary depending on the species and life stage. For example, NMFS (2008) noted that short-term increases in suspended sediments or turbidity were unlikely to affect the foraging success of green sturgeon because this species uses olfactory cues as opposed to vision to locate prey. The most sensitive species to turbidity, sedimentation, and other physical disturbances are those that spawn in the project area.

Increased turbidity and sediment loading also can result in longer-term effects due to the siltation of gravel streambeds (decreasing their suitability as spawning habitat), filling of pool habitat, and reduction in benthic macroinvertebrate prey organisms. The removal of deposited material from affected habitats is dependent on subsequent flow conditions, physical attributes of the watercourse such as gradient and streambed composition, and the characteristics of the deposited sediment. Full recovery of streambed conditions has been reported to occur between 6 weeks and 2 years after construction. Anderson and coauthors (1996) stated,

> …based on all of the information available, it is anticipated that minor accumulations of surficially deposited sediments downstream of instream construction would normally be removed by the stream during normal, high flow events such as large spate or spring freshet. Larger accumulations of surficial sediments, especially coarse-grained sand slugs (not likely at any of the proposed crossing sites), may require larger flood events, but in most cases should be removed within a year in areas which experience a spring freshet.

In addition, increased turbidity and sedimentation downstream of the construction areas may negatively affect benthic invertebrates through alteration of water quality and substrate conditions. Benthic macroinvertebrates in the area isolated by cofferdams and areas immediately downstream are expected to recover rapidly following construction. Organisms that occur in the drift such as mayflies, caddisflies, and midge larvae are usually the first colonizers . Full recovery of benthic invertebrate communities usually requires 6 months to a year after construction (Tsui and McCart 1981; Young and Mackie 1991; Vinikour and Schubert 1987). Because no instream work would occur, and juvenile salmonids have the ability to use other food resources (e.g., terrestrial insects)

during the summer months, few if any measurable effects on the growth or survival of juvenile salmonids are anticipated.

With implementation of the environmental commitment to implement a SWPPP, and standard erosion and sediment control BMPs (see Section 2.4, *Environmental Commitments*), these effects are expected to be less than significant.

Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities

Releases of contaminants such as bentonite, gasoline, diesel fuel, lubricants, hydraulic fluid, and others contained in construction equipment, potentially could result in acute negative effects on fish, invertebrates, and instream habitat (National Marine Fisheries Service 2006). In addition, long-term effects could result if a spill were not properly remediated. The only potential sources of contaminants in the project would be the construction equipment itself (lubricating oils and fuel). The worst-case scenario for a hazardous materials release from construction equipment likely would be 100 gallons (estimated maximum size of fuel tanks, hydraulic fluid reservoirs, etc.). These substances can kill aquatic organisms through exposure to lethal concentrations or exposure to non-lethal levels that cause physiological stress and increased susceptibility to other sources of mortality such as predation. Petroleum products also tend to form oily films on the water surface that can reduce DO levels available to aquatic organisms. Adverse effects related to contaminant spills and leaks are potentially significant but would be adequately mitigated by implementing a SWPPP and a spill prevention, control, and countermeasure plan (see Section 2.4, *Environmental Commitments*) as part of the environmental commitments for the project.

There is also a slight risk of the release of bentonite into the Feather River during jet grouting or deep soil mixing used to construct slurry cut off walls. Bentonite is a naturally occurring, inert, nontoxic material that meets National Sanitation Foundation/American National Standards Institute (NSF/ANSI) Drinking Water Additives Standards 60 and 61. Therefore, any inadvertent release of drilling fluid containing only water and bentonite would not have toxicity effects on ESA-listed fish. However, bentonite released into streams still could clog the gills of fish and cause suffocation and fill interstitial spaces, reducing the suitability of spawning gravels. It could smother vegetation and macroinvertebrate habitats and interfere with filter-feeding of invertebrates. The implementation of a spill prevention, control, and countermeasure plan as part of the environmental commitments of the project is anticipated to minimize the potential for hazardous spills or chemical inputs to the Feather River. The spill prevention, control, and countermeasure plan also would identify appropriate measures for immediately cleaning up all spills regardless of size, and provide for staging and storage areas for equipment, materials, fuels, lubricants, solvents, and other possible contaminants away from watercourses and their watersheds. Release of bentonite is not anticipated, and implementation of the spill prevention, control, and countermeasure plan would reduce the extent of potential effects to a less-than-significant level.

Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration

Construction activities (e.g., excavation, driving sheet pile, grading) near the Feather River may result in noise and vibrations that potentially could alter fish behavior (Feist et al. 1992). In general, exposure to high sound levels “can damage the inner ear sensory cells, produce hearing loss, elicit stress responses, and alter the behavior of fishes” (Popper et al. 2003). Vibrations and sound pressure waves generated from driving sheet pile through the crown of levees that travels through

the soil to create underwater noise is expected to attenuate quickly because pile driving would occur on land adjacent to the river and not within the watercourse itself. Therefore, the level of underwater noise from the upland sheet pile driving under Alternative 1 is anticipated to result in a less-than-significant effect on fish species of primary management concern.

3.10.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on fish and aquatic resources. These potential effects and related mitigation measure requirements are summarized in Table 3.10-7 and discussed below.

Table 3.10-7. Fish and Aquatic Resources Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)	Less than significant	None required	Less than significant
Effect FISH-2: Construction-Related Erosion Resulting in Substantially Increased Sedimentation and Turbidity	Less than significant	None required	Less than significant
Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities	Less than significant	None required	Less than significant
Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration	Less than Significant	None required	Less than Significant

Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)

Compared to Alternative 1, implementation of Alternative 2 is expected to result in potentially greater removal of riparian vegetation. Alternative 2 construction activities are assumed to result in removal of all riparian vegetation within the construction footprint. An estimate of the total ~~acreage~~ number of riparian ~~vegetation~~ trees on the waterside of the levee to be removed is presented in Section 3.8, *Vegetation and Wetlands*, Table 3.8-6.

Similar to Alternative 1, there are no construction activities proposed in-river or below OHWM; all activities that would result in physical disturbance and removal of vegetation on the waterside slope of the levee would be limited to areas above OHWM. Therefore, no physical modification of critical habitat for ESA-listed fish species would be expected because all proposed construction activities would occur above the OHWM of the Feather River. However, there would be effects on floodplain riparian habitat that may affect listed fish species. For the purposes of NEPA and CEQA, the effect on fisheries resources would be less than significant.

Effect FISH-2: Construction-Related Erosion Resulting in Sedimentation and Turbidity

As described above under Alternative 1, temporary disturbance of fish and degradation of habitat may occur during construction activities. Effects on fish and habitat would be greater under this alternative because more levee construction and disturbance are expected to occur. Construction activities occurring along the levee footprint could cause increased sedimentation and turbidity during spawning periods, resulting in significant and adverse effects on these special-status species. However, with implementation of the environmental commitment to implement a SWPPP, described

above under Alternative 1, and standard erosion and sediment control BMPs, as part of the project, these effects are expected to be less than significant.

Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities

As discussed under Alternative 1, accidental spills or leakage of contaminants such as bentonite, gasoline, lubricants, and other petroleum-based products could kill or injure fish in the project area. Effects on fish could be greater under this alternative because of the potentially greater extent and duration of construction activities on the waterside slope of the levee. Adverse effects related to contaminant spills and leaks are potentially significant but would be adequately mitigated by implementing a spill prevention, control, and countermeasure plan and a SWPPP, described above under Alternative 1, as part of the environmental commitments for the project. Therefore, potential effects associated with contaminant spills are expected to be less than significant.

Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration

As described above under Alternative 1, temporary disturbance of fish and degradation of habitat may occur during construction activities. Effects on fish and habitat would be greater under this alternative because levee construction and disturbance are expected to occur. However, as described under Alternative 1, because construction would occur only on land near the Feather River and not in the water, potential effects associated with noise and vibration would be less than significant.

3.10.4.4 Alternative 3

Like Alternatives 1 and 2, Alternative 3 includes construction of cutoff walls along the entire construction footprint from Reaches 2 through 41. In addition, Alternative 3 includes a limited number of seepage berms, relief wells, slope flattening and depression infilling, ditch lining and levee reconstruction actions. Approximately 9,500 feet of canal would be kept in place and monitored with a Flood Safety Plan. Implementation of the Flood Safety Plan would occur as described in Section 2.3. This alternative would result in approximately the same amount of disturbance as Alternative 1.

Implementation of Alternative 3 would potentially result in effects on fish and aquatic resources. These potential effects and related mitigation measure requirements are summarized in Table 3.10-8 and discussed below.

Table 3.10-8. Fish and Aquatic Resources Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)	Less than significant	None required	Less than significant
Effect FISH-2: Construction-Related Erosion Resulting in Substantially Increased Sedimentation and Turbidity	Less than significant	None required	Less than significant
Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities	Less than significant	None required	Less than significant
Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration	Less than Significant	None required	Less than Significant

Effect FISH-1: Loss or Degradation of Riparian and SRA Cover (including Critical Habitat)

The amount of riparian vegetation removed along the shoreline under Alternative 3 is expected to be similar to that under Alternative 1. An estimate of the total ~~acreage~~ number of riparian ~~vegetation~~ trees on the waterside of the levee to be removed is presented in Section 3.8, *Vegetation and Wetlands*, Table 3.8-6.

Similar to Alternative 1, there are no construction activities proposed in-river or below OHWM; all activities that would result in physical disturbance and removal of vegetation on the waterside slope of the levee would be limited to areas above OHWM. Therefore, no physical modification of critical habitat for ESA-listed fish species would be expected because all proposed construction activities would occur above the OHWM of the Feather River. However, there would be effects on floodplain riparian habitat that may affect listed fish species. For the purposes of NEPA and CEQA, the effect on fisheries resources would be less than significant.

Effect FISH-2: Construction-Related Erosion Resulting in Sedimentation and Turbidity

Temporary disturbance of fish and degradation of habitat may occur during construction activities for Alternative 3 and is anticipated to be the same as under Alternative 1. Construction activities occurring along the levee footprint could cause increased sedimentation and turbidity during spawning periods that would result in significant and adverse effects on special-status species. However, with implementation of the project environmental commitment to implement a SWPPP, described above, and standard erosion and sediment control BMPs, these effects are expected to be less than significant.

Effect FISH-3: Adverse Effects on Fish Health and Survival Associated with Potential Discharge of Contaminants during Construction Activities

As discussed under Alternative 1, accidental spills or leakage of contaminants such as bentonite, gasoline, lubricants, and other petroleum-based products could kill or injure fish in the project area. Effects on fish under Alternative 3 would be the same as described under Alternative 1. Adverse effects related to contaminant spills and leaks are potentially significant but would be adequately mitigated by implementing a spill prevention, control, and countermeasure plan and a SWPPP, described above, as part of the environmental commitments for the project. Therefore, potential effects associated with contaminant spills are expected to be less than significant.

Effect FISH-4: Adverse Effects Caused by Construction Equipment Noise and Vibration

Temporary disturbance of fish and degradation of habitat may occur during construction activities. Effects on fish and habitat under Alternative 3 would be similar to those under Alternative 1. Therefore, the level of underwater noise from the upland sheet pile driving under Alternative 3 is anticipated to result in a less-than-significant effect on fish.

3.11 Agriculture, Land Use, and Socioeconomics

3.11.1 Introduction

This section describes the regulatory and environmental setting for agriculture, land use, and socioeconomics; effects on agriculture, land use, and socioeconomics that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.11.1 Affected Environment

This section describes the affected environment for agriculture, land use, and socioeconomics in the project area. Following are the key sources of data and information used in the preparation of this section.

- Butte County General Plan 2030 (Butte County 2010).
- Sutter County General Plan, Public Draft (Sutter County 2010a).
- Sutter County General Plan Draft Environmental Impact Report (Sutter County 2010b).
- City of Yuba City General Plan (City of Yuba City 2004).
- City of Live Oak 2030 General Plan (City of Live Oak 2010).

3.11.1.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to agriculture, land use, and socioeconomics. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to agriculture and land use may apply to implementation of the proposed project. Socioeconomic issues are generally handled at the state and local level; therefore, this section contains no Federal regulations related to socioeconomics.

Farmland Protection Policy Act

The National Agricultural Land Study conducted in 1980–1981 found that each year millions of acres of farmland were being converted to other uses in the United States. In addition, a 1981 Congressional report acknowledged the need for Congress to carry out programs and policies to protect farmland. Congress passed the Agriculture and Food Act of 1981, which contained the Farmland Protection Policy Act (FPPA). The FPPA requires Federal agencies to identify the amount of farmland converted by Federal programs to nonagricultural use, assess the potential effects of a proposed project on prime and unique farmland, and consider alternative actions that would lessen such effects. Projects are subject to FPPA requirements if they may, directly or indirectly, irreversibly convert farmland to nonagricultural use and are implemented by a Federal agency or with assistance from a Federal agency. The Natural Resources Conservation Service (NRCS) is the Federal agency responsible for ensuring compliance with these laws and policies.

The purpose of the FPPA is to minimize the contribution of Federal programs to the irreversible conversion of farmland to nonagricultural uses and ensure that Federal programs are administered in a manner compatible with Federal, state, local, and private farmland protection programs and policies. Lands subject to the FPPA do not have to be currently used for crops, but do include prime farmland, unique farmland, and lands of statewide or local importance. These lands can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

During preparation of this EIS/EIR, ICF (as proxy for USACE) coordinated with NRCS on Form NRCS-CPA-106 to determine a Farmland Conversion Impact Rating and to ensure that all important farmland in the project area subject to conversion has been properly identified and considered in the analysis. The Oroville regional NRCS office oversaw the scoring of the Butte County portion of the project and the Yuba City regional NRCS office oversaw the scoring of the Sutter County portion of the project. The forms are located at the end of this chapter (Figure 3.11-1).

State

The following state policies related to agriculture, land use, and socioeconomics may apply to implementation of the proposed project.

Farmland Mapping and Monitoring Program

California established the Farmland Mapping and Monitoring Program (FMMP) in 1982 to continue the Important Farmland Inventory efforts begun by the NRCS in 1975. The FMMP is a non-regulatory program intended to aid in assessing the location, quality, and quantity of agricultural lands and conversion of such lands over time. The FMMP provides consistent and impartial data for the analysis of agricultural land uses and land use changes in California. Under the FMMP, the first Important Farmland Maps were produced in 1984, covering 38 of the state's 58 counties; current maps, released every 2 years, cover almost 98% of the state's privately held land (California Department of Conservation 2011). The FMMP rates agricultural land according to soil quality and irrigation status within the designations discussed below.

Prime Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables.

Farmland of Statewide Importance

Farmland of statewide importance is land of statewide or local importance identified by state or local agencies for agricultural use, but not of national significance.

Farmland of Local Importance

Farmland of local importance is land identified as important to the local agricultural economy by each county's board of supervisors and a local advisory committee.

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 11/1/12	4. Sheet 1 of 1
1. Name of Project **Feather River West Levee Project**	5. Federal Agency Involved **US Army Corps of Engineers**	
2. Type of Project **Levee Improvements**	6. County and State **Sutter County, CA**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 11/1/12	2. Person Completing Form **Gabe Garbarino**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated 231,713	Average Farm Size 285
5. Major Crop(s) **Rice, walnuts, prunes**	6. Farmable Land in Government Jurisdiction Acres: 274,439 % 71.2	7. Amount of Farmland As Defined in FPPA Acres: 292,256 % 75.8
8. Name Of Land Evaluation System Used **CA Revised Storie Index**	9. Name of Local Site Assessment System **None**	10. Date Land Evaluation Returned by NRCS 11/15/12

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	170.30			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	0			
C. Total Acres In Corridor	676.65			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	122.4			
B. Total Acres Statewide And Local Important Farmland	22.8			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	.04			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	Not available			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	79			

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	13			
2. Perimeter in Nonurban Use	10	9			
3. Percent Of Corridor Being Farmed	20	0			
4. Protection Provided By State And Local Government	20	0			
5. Size of Present Farm Unit Compared To Average	10	10			
6. Creation Of Nonfarmable Farmland	25	0			
7. Availablility Of Farm Support Services	5	5			
8. On-Farm Investments	20	2			
9. Effects Of Conversion On Farm Support Services	25	0			
10. Compatibility With Existing Agricultural Use	10	0			
TOTAL CORRIDOR ASSESSMENT POINTS	160	39	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	79	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	39	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	118	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
Corridor A (Alt 3)	168.5	12/3/12	YES ☐ NO ☑

5. Reason For Selection:

Corridor A (Alternative 3) was selected because it is the preferred alternative and scored under the threshold of 160 on this form.

Signature of Person Completing this Part: [signature] DATE 12/3/12

NOTE: Complete a form for each segment with more than one Alternate Corridor

Figure 3-11

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 11/1/12	4. Sheet 1 of 1
1. Name of Project **Feather River West Levee Project**	5. Federal Agency Involved **US Army Corps of Engineers**	
2. Type of Project **Levee Improvements**	6. County and State **Butte County, CA**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 11/6/12	2. Person Completing Form **Dan Taverner**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated 222713	Average Farm Size 183
5. Major Crop(s) **Rice, almonds, walnuts**	6. Farmable Land in Government Jurisdiction Acres: 242,058 % 21.2	7. Amount of Farmland As Defined in FPPA Acres: 242,058 % 23.1
8. Name Of Land Evaluation System Used **California Revised Storie Index**	9. Name of Local Site Assessment System **None**	10. Date Land Evaluation Returned by NRCS 11/6/12

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment (Afterbay outlet to Butte County line)			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	74			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	0			
C. Total Acres In Corridor	102.87			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	74			
B. Total Acres Statewide And Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.706			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	not available			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	60			

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	15			
2. Perimeter in Nonurban Use	10	10			
3. Percent Of Corridor Being Farmed	20	0			
4. Protection Provided By State And Local Government	20	20			
5. Size of Present Farm Unit Compared To Average	10	10			
6. Creation Of Nonfarmable Farmland	25	0			
7. Availablility Of Farm Support Services	5	5			
8. On-Farm Investments	20	4			
9. Effects Of Conversion On Farm Support Services	25	0			
10. Compatibility With Existing Agricultural Use	10	0			
TOTAL CORRIDOR ASSESSMENT POINTS	160	64	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	60	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	64	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	124	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
Corridor A (Alt 3)	74	12/3/12	YES ☐ NO ☑

5. Reason For Selection:

Corridor A (Alternative 3) was selected because it is the preferred alternative and scored under the threshold of 160 on this form.

Signature of Person Completing this Part: *Dan Taverner* DATE 12/3/12

NOTE: Complete a form for each segment with more than one Alternate Corridor

Figure 3-11. Continued

Williamson Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is a state policy administered at the local government level. The Williamson Act is intended to preserve agricultural and open space lands through contracts with private landowners. By entering into a Williamson Act contract, the landowner foregoes the possibility of converting agricultural land to non-agricultural use for a rolling period of 10 years in return for lower property taxes. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971.

The Williamson Act was amended in August 1998 to establish Farmland Security Zones. In return for a 20-year contract commitment, property owners are granted greater tax reductions. Neither Sutter County nor Butte County currently participates in the Farmland Security Zone program.

Of California's 58 counties, 53 have adopted the Williamson Act program, including Sutter and Butte Counties. The Environmental Setting section below discusses the location of Williamson Act lands within the project area.

Senate Bill 5

Circumstances regarding flood risk may influence community development and population growth. One such circumstance is the imposition of development restrictions if target levels of ~~flood protection~~performance are not in place. Specifically, as required by California SB 5 (signed by then-Governor Schwarzenegger in October 2007), the CVFPB must adopt a CVFPP by July 1, 2012. The CVFPP will require a 200-year level of ~~flood protection~~performance for urban and urbanizing areas by 2025. No new development will be permitted if this level of protection is not met. As an interim measure, no new development will be permitted if adequate progress is not being made toward this goal by 2015

Local

Portions of the project area fall under the jurisdiction of the Sutter County, Butte County, and Yuba City general plans. In addition, part of the project area lies outside the Live Oak City limit but within its Sphere of Influence. Each of these municipalities has adopted goals and policies related to agriculture, land use, and socioeconomics, detailed in Appendix A, which may apply to implementation of the proposed project.

3.11.1.2 Environmental Setting

The following considerations are relevant to agricultural, land use, and socioeconomic conditions in the proposed project area.

The proposed project would take place within a narrow strip of Sutter and Butte Counties, including a small area on the eastern edge of Yuba City, approximately 41 miles long and 600 feet wide, along and encompassing the Feather River West Levee. For purposes of agricultural and land use evaluations, the project area consists primarily of the area directly subjected to the proposed project activities, as well as overall issues of agricultural productivity and land use patterns within the two counties and Yuba City. For purposes of evaluating socioeconomic effects, relevant countywide economic data is also considered.

Study Area Farmland Mapping and Monitoring Program Classifications

The FMMP designates the vast majority of Sutter County land as important farmland. According to the most recent mapping, the county has approximately 162,673 acres of prime farmland, 105,395 acres of farmland of statewide importance, 17,752 acres of unique farmland, and 53,538 acres of grazing land (California Department of Conservation, Division of Land Resource Protection 2011). Within the Sutter County portion of the project area, much of the land along the west bank of the Feather River is classified as prime farmland, with farmland of statewide importance located immediately south of Yuba City and near Live Oak (Plate 3.11-1).

Only about one-third of Butte County is designated by the FMMP as important farmland; however, this land is almost exclusively located in the flat, western half of the county. According to the most recent mapping, Butte County has approximately 193,290 acres of prime farmland; 21,792 acres of farmland of statewide importance; 22,190 acres of unique farmland; and 403,078 acres of grazing land (California Department of Conservation, Division of Land Resource Protection 2010). Within the Butte County portion of the project area, prime farmland, located along the western edge of the Feather River between Reaches 25 and 40 (Plate 3.11-1), is the most common. A small area of unique farmland lies south of Thermalito Afterbay.

Sutter County Agriculture

Sutter County is largely rural, with agriculture being the dominant land use. More than 86% of land within the county is used for agriculture (Sutter County 2011a). As of 2010, food and agricultural production accounted for approximately 20% of the total economic output of all industries in the county (Sutter County 2010a).

Agricultural Production

Agriculture in Sutter County is either intensive (i.e., field crops, seed crops, vegetable crops, fruit and nut crops, nursery stock, and apiary products) or extensive (i.e., animal-related forms of agriculture). The dominant crops produced in the county are rice and other field crops, dried plums, English walnuts, almonds and other fruits and nuts, seed crops, tomatoes and other vegetable crops, nursery products, and apiary and livestock products. The top 10 crops for Sutter County in 2010, by value, were milling rice, English walnuts, dried plums, clingstone peaches, processing tomatoes, almonds, orchard biomass, seed rice, nursery products, and vegetable and vinecrop seed (U.S. Department of Agriculture, National Agricultural Statistics Service 2011). A list of the harvested acreages for these crops is provided in Table 3.11-1.

For the 2010 crop year, compared with other California counties, Sutter County ranked first in dried plum production and orchard biomass production, second in rice production, vegetable and vinecrop seed production, and honeydew melon production, fourth in peach production, and fifth in alfalfa seed production (U.S. Department of Agriculture, National Agricultural Statistics Service 2011).

Orchards, with their associated fruit and nut crops, predominate within the Sutter County portion of the project area, both from Reaches 2 through 11 and north of Yuba City, from Reach 18 north to the county line (Reach 25). Along these project reaches, agricultural lands not planted to orchard crops are currently in use for field crops.

Table 3.11-1. Sutter County Primary Crop Harvested Acreage, 2010

Crop	Crop Type	Harvested Acres	Crop Values
Almonds	Fruit and nut	4,453	$17,374,000
Peaches	Fruit and nut	7,120	$32,284,100
Dried plums	Fruit and nut	18,577	$48,830,000
Walnuts (English)	Fruit and nut	21,999	$71,760,700
Kiwifruit	Fruit and nut	104	$993,000
Lima beans	Field	1,965	$1,774,000
Miscellaneous beans	Field	4,765	$3,178,500
Corn, field grain	Field	4,317	$3,940,600
Hay (alfalfa)	Field	5,759	$4,360,000
Pasture (irrigated)	Field	10,500	$1,470,000
Pasture (range, dry)	Field	64,500	$645,000
Rice	Field	115,449	$202,945,800
Safflower	Field	1,938	$629,500
Wheat	Field	12,490	$5,967,000
Straw	Field	6,696	$359,200
Wild Rice	Field	550	$481,300
Melons (honeydew)	Vegetable	2,639	$7,678,500
Tomatoes (processing)	Vegetable	7,331	$22,390,000
Beans	Seed	614	$601,100
Rice	Seed	5,542	$14,952,800
Safflower	Seed	1,038	$191,000
Sunflower	Seed	7,740	$8,703,900

Source: Sutter County 2011b.

Williamson Act Lands

As of 2009, the most recent data available, a total of 64,573 acres of Williamson Act lands were located throughout Sutter County (Sutter County 2011b**:**24). No parcels within the Sutter County portion of the project area are currently under Williamson Act protection (Plate 3.11-2).

City of Yuba City Agriculture

Within the Yuba City Planning Area, agriculture is the most common open space land use and is vital to the city's economy (City of Yuba City 2004). However, very little agricultural land lies within the city limits. Orchards are the primary agricultural use within the Yuba City Planning Area.

As of 2002, the Yuba City Planning Area had 913 acres of prime farmland, 4,432 acres of farmland of statewide importance, 273 acres of unique farmland, no farmland of local importance, and 264 acres of grazing land (City of Yuba City 2004). Of this, no undeveloped acres of prime farmland, unique farmland, or grazing land fall within the project area. One agricultural area, planted to orchard crops, lies east of Reach 17 and within the city limit.

City of Live Oak Agriculture

Live Oak is located in a part of the Sacramento Valley with some of the richest soils in the state. Orchards occupy a large portion of the Live Oak SOI, and crops such as plums, peaches, apricots,

almonds, walnuts, citrus, and alfalfa are grown in the area (City of Live Oak 2010). Farmland surrounds the town and is considered a vital component of the character, economy, history, and culture of Live Oak. As of 2006, important farmland within the city SOI was largely farmland of statewide importance, with small areas of prime farmland located to the southeast of the city (California Department of Conservation, Division of Land Resource Protection 2011). Within the Live Oak SOI portion of the project area, agricultural uses consist almost entirely of orchards.

Butte County Agriculture

Butte County is mostly rural, and agriculture is the most common land use in the county, totaling nearly 60% of all land use. Most of this agricultural land falls within the western portion of the county.

Agricultural Production

The main crops produced in Butte County include fruits and nuts as well as field, seed, and vegetable crops; livestock, apiary, and nursery products are also produced. The three most land-intensive crops in the county are rice, almonds, and English walnuts, accounting for more than one-third of the agricultural land (Butte County 2011). Table 3.11-2 lists the harvested acreage of Butte County's primary crops. The county's top 10 crops by value in 2010 were milling rice, English walnuts, almonds, dried plums, miscellaneous nursery products, seed rice, cattle and calves, unspecified fruits and nuts, clingstone peaches, and kiwi fruit (U.S. Department of Agriculture, National Agricultural Statistics Service 2011).

For the 2010 crop year, compared with other California counties, Butte County ranked second in dried plum production, English walnut production, and kiwi fruit production, third in rice production, and fifth in olive production (U.S. Department of Agriculture, National Agricultural Statistics Service 2011). Agricultural lands along the Butte County project reaches are dedicated almost exclusively to orchard crops.

Table 3.11-2. Butte County Primary Crop Harvested Acreages, 2010

Crop	Crop Type	Harvested Acres	Crop Values
Almonds	Fruit and nut	39,262	$113,781,000
Olives (oil)	Fruit and nut	2,055	$4,904,000
Peaches (clingstone)	Fruit and nut	2,288	$9,690,000
Dried plums	Fruit and nut	10,790	$42,556,000
Walnuts (English)	Fruit and nut	33,330	$173,392,000
Kiwi fruit	Fruit and nut	710	$8,177,000
Beans, dry	Field	950	$1,970,000
Hay (alfalfa)	Field	1,080	$809,000
Pasture (irrigated)	Field	16,500	$2,030,000
Pasture (other)	Field	245,000	$3,553,000
Rice	Field	93,800	$182,248,000
Wheat	Field	3,964	$1,591,000
Rice	Seed	4,327	$10,865,000

Source: Butte County 2011.

Williamson Act Lands

Butte County has Williamson Act tracts scattered throughout its western half. As of 2009, the most recent data available, Williamson Act contracts protected 217,151 acres of the county's agricultural land (California Department of Conservation, Division of Land Resources Protection 2010). Within the Butte County portion of the project area, the Williamson Act lands consist primarily of prime farmland (California Department of Conservation, Division of Land Resource Protection 2011).

3.11.1.3 Sutter County Land Use

Sutter County, whose southern boundary is located about 10 miles north of Sacramento, is the southernmost of the two project area counties. The Feather River serves as much of the county's eastern boundary; the Sacramento River and the Butte Sink area of Colusa County form the county's western boundary. Butte County adjoins Sutter County to the north and Sacramento, Yolo, and Placer Counties lie to the south. Sutter County covers approximately 607 square miles, 592 of which are unincorporated (Sutter County 2011a). The population of unincorporated Sutter County as of January 2010 was 21,408 (California Department of Finance 2011).

The county's overall land use pattern is rural in nature and dominated by expansive agricultural areas, significant natural and recreational resources (including the Sutter Buttes, the Feather River Wildlife Refuge, Gray Lodge Wildlife Area, and Bobelaine Audubon Sanctuary), and relatively low population density. Two incorporated cities, Yuba City and Live Oak, fall within the Sutter County portion of the project area and are discussed separately below.

Eighty-six percent of Sutter County's lands are dedicated to agriculture. Uses include field and row crops, orchards, rice, livestock grazing, dry farming, and timber (Sutter County 2010a). Agricultural lands are primarily limited to the unincorporated areas of the county, although approximately 598 acres and 98 acres of agricultural uses lie within the city limits of Yuba City and Live Oak, respectively (Sutter County 2010b:4-10). Sutter County's second-largest land use is open space, comprising nearly 12% of the county's area. Existing Sutter County land uses are described in Table 3.11-3 and shown in Plate 3.11-3 (Sutter County 2010b:4-7).

Table 3.11-3. Existing Land Uses in Sutter County

Land Use	Acres	Percentage of County Land
Agricultural	328,208	86.6%
Residential	1,971	1.0%
Public and Airport	472	0.1%
Commercial	424	0.1%
Industrial	749	0.2%
Open Space, Parks, and Golf Course	44,919	11.9%
Transportation and Utilities	1,809	0.5%
Vacant	323	0.1%
Total	378,875	100%

Source: Sutter County 2010b:4-7.

With the exception of urbanized Yuba City, agriculture and its accessory uses dominates the land use pattern of the Sutter County project reaches. As the proposed project would primarily affect lands

west of the Feather River, this discussion focuses on those areas, with some exceptions. South of Yuba City, most of the project area lands are designated either AG-20 (agriculture, 20-acre minimum) or AG-80 (agriculture, 80-acre minimum) by Sutter County; lands east of the project area (within the Feather River floodway) are primarily designated OS (open space), with a floodplain overlay. In keeping with these designations, agricultural uses predominate west of the Feather River from Reaches 2 through 11, consisting mainly of orchards interspersed with parcels devoted to field crops. A variety of farm structures, including residences, barns, shop buildings, and other agricultural accessory uses, are scattered throughout the project area reaches. Abbott Lake lies immediately east of Reach 7, and Boyd's Boat Launch is located east of Reach 9. From the northernmost section of Reach 11 through Reach 17, the project area follows the eastern edge of Yuba City, with the exception of Reaches 14 and 15, which pass east of the city limit through lands designated open space by Sutter County. Near the northern part of Yuba City, the project area crosses the Union Pacific Railroad line, re-entering unincorporated Sutter County near the transition from Reach 17 to 18, and continues northward, east of Live Oak, to the county line through lands designated AG-20, an area of agricultural uses similar in character to those south of Yuba City. As with the southern Sutter County project area, lands immediately east of the project reaches are designated open space with a floodplain overlay. Reach 25 is the northernmost portion of the project area within Sutter County.

3.11.1.4 City of Yuba City Land Use

Yuba City, the Sutter County seat and the most densely populated portion of the project area, lies 42 miles north of Sacramento. Its boundaries encompass approximately 14 square miles (9,355 acres) of land. Portions of the city abut the west bank of the Feather River. As of January 2010, Yuba City's population was 64,929 (California Department of Finance 2011). The majority of Sutter County's population lives in Yuba City, which contains a broad range of residential, commercial, office, industrial, open space, and public facility uses (Plate 3.11-3).

Residential uses are the principal land use in the city, encompassing nearly 56% of the city's incorporated area, followed by commercial and office uses, public uses, and industrial uses (Table 3.11-4) (Sutter County 2010b:4-10). Within the city limits, approximately 598 acres of agriculture border the urbanized area to the west, north, and south, and 383 acres of open space exist, most of which serve as a buffer between the city and the Feather River to the east (City of Yuba City 2004).

Lands along the Yuba City portion of the project area consist primarily of urban uses. Single family residential neighborhoods and the southern boundary of Yuba City coincide with the northernmost portion of Reach 11, and single-family residential areas also border Reaches 12 and 13. Industrial and light industrial uses adjoin the northern section of Reach 13. Reaches 14 and 15 lie outside the city limit, along the east side of the Sutter County Airport facilities. North of the airport and south of the SR 20 bridge, areas of multi-family residential, office, and commercial uses border the western edge of Reach 16; part of the Feather River Levee Bike Trail also lies within this portion of the project area. Junctures with both the Twin Cities Memorial Bridge and the SR 20 (Colusa Avenue) bridge also distinguish Reach 16. North of the SR 20 bridge, Reaches 16 and 17 border a variety of light industrial and commercial uses. Lands east of Reaches 16 and 17 include some agricultural uses and carry AH (agricultural holding district) and F (flood district) designations.

Table 3.11-4. Existing Land Uses in the City of Yuba City

Land Use	Acres	Percentage of City Land
Agriculture	598	7%
Open space	383	4%
Public uses	900	10%
Residential	5,020	56%
Commercial and office	1,100	12%
Industrial	800	9%
Other uses	164	2%
Total	8,965	100%

Source: Sutter County 2010b:4-10.

3.11.1.5 City of Live Oak Land Use

The city of Live Oak lies about 1 mile west of the project area and 10 miles north of Yuba City; however, the Live Oak SOI extends north to the Sutter–Butte County line, south to Paseo Road, and east to the Feather River, encompassing portions of project Reaches 22 through 25. Live Oak occupies approximately 2 square miles (1,165 acres), with a population of 8,428 as of January 2010 (California Department of Finance 2011).

Land uses in Live Oak include residential, commercial, industrial, public, and agricultural uses. Approximately 70% of Live Oak's land use is residential in nature (Sutter County 2010b:4-10). Single-family housing accounts for 80% of the city's housing stock (City of Live Oak 2010:IN-13). The second most common land use is public uses, followed by agricultural, transportation and utilities, commercial, and industrial (Sutter County 2010b:4-10). Parks, schools, churches, and government offices are scattered throughout the city, while commercial and industrial uses are primarily concentrated near SR 99, which bisects the city. In addition, Live Oak contains approximately 98 acres of small agricultural parcels (Sutter County 2010b:4-10). Table 3.11-5 and Plate 3.11-3 outline the land uses in the city.

Although the project area does not enter the Live Oak city limit, Reaches 22 through 25 pass east of Live Oak, within Sutter County jurisdiction but also within the city's SOI. Agricultural uses in this area consist almost entirely of orchards, with scattered residences and related agricultural facilities; the area carries a designation of AG-20 (Agriculture, 20-acre minimum).

Table 3.11-5. Existing Land Uses in the City of Live Oak

Land Use Designation	Acres
Single-Family Residential	485
Multi-Family Residential	21
Rural Residential	471
Duplex	12
Mobile Home	11
Office	2
Commercial	25
Industrial	35
Open Land	125
Civic/Public	151
Vacant	72
Railroad	44
Park	6
Agriculture	2,766
Total	4,228

Source: City of Live Oak 2010:4.1-4.

3.11.1.6 Butte County Land Use

The northern reaches of the proposed project traverse southern Butte County, home to Thermalito Afterbay (a part of the Oroville Dam project), the northern edge of the project area. Butte County's southernmost boundary lies about 52 miles north of Sacramento, and its northernmost boundary is less than 150 miles from the California–Oregon border. The Feather River emerges from Thermalito Afterbay and runs south through the center of the southern portion of Butte County and into Sutter County. The county has a total area of 1,677 square miles, of which 1,639 square miles are land and 38 square miles are water. The population of unincorporated Butte County as of January 2010 was 83,809 (California Department of Finance 2011).

Agricultural and public uses occupy most of Butte County. Nearly 60% of Butte County lands are devoted to agriculture (Butte County 2010:41). The county's second most common land use is public/quasi-public, which includes parcels owned by Federal, state, and county agencies; publicly owned parcels; parcels owned by special districts; and parcels that accommodate civic and institutional uses, such as churches and hospitals, and utilities. Public and quasi-public uses account for approximately 178,400 acres, roughly 17% of land in the unincorporated county (Butte County 2010:45). Slightly more than 10% of unincorporated Butte County consists of residential uses (Butte County 2010). Existing land uses for Butte County are outlined in Table 3.11-6 and in Plate 3.11-3 (Butte County 2010:41).

Butte County has five incorporated cities, as well as numerous unincorporated communities: Oroville, the county seat; Chico; Paradise; Gridley; and Biggs. Other than the unincorporated community of East Gridley, these cities and communities are outside the area expected to experience the proposed project's land use and agricultural effects and are therefore not discussed further.

Table 3.11-6. Existing Land Uses in Butte County

Land Use	Acres	Percentage of County Land
Agriculture	599,040	58.11%
Public/quasi-public	178,400	17.3%
Residential—single-family	117,210	11.4%
Vacant	93,800	9%
Undefined	26,820	2.6%
Residential—multi-family	9,700	0.9%
Commercial and office	4,140	0.4%
Industrial	1,400	0.14%
Tribal lands	400	0.038%
Total	1,030,910	99.89%

Source: Butte County 2010:42.
Note: This table includes the acreages of land uses as they exist on the ground, as recorded by the Butte County Assessor.

Project Reaches 25 through 41 are within the boundaries of Butte County, and are characterized by agricultural and open space uses. Agricultural uses in this area consist primarily of orchards, with associated residences and agricultural facilities. Lands between Reaches 25 and 40 carry either an AG-40 or a P-Q designation, including the community of East Gridley, located immediately south of East Gridley Road within Reach 30. East Gridley contains a variety of uses, including residential, commercial, and school facilities. North of East Gridley, from Reach 31 to Reach 40, agricultural uses again predominate. The final project Reach, 41, is located at the southern edge of Thermalito Afterbay and falls within a Resource Conservation Zone.

3.11.1.7 Sutter County Socioeconomics

Sutter County is one of northern California's major agricultural counties (California Employment Development Department 2010a), and its traditional job base is agriculture. Agriculture and agriculture-related support industries have been and continue to be the county's top "competitive edge" private industries (California Economic Development Partnership 2009a).

As residential growth increased, so did the number of service and retail industries in the county (Sutter County 2010a:5-1). Government, health care, and construction have become some of the county's largest employment sectors (Bureau of Economic Analysis 2010a; California Economic Development Partnership 2009a). The fastest growing job markets between 2001 and 2007 included mining, administrative and waste services, utilities, and information (Table 3.11-7) (California Economic Development Partnership 2009a). The projected fastest growing job sectors in the county are home health and home care aides, truck and heavy equipment mechanics and drivers, and retail workers (California Economic Development Partnership 2009a). The county plans to diversify its economic base and create a regulatory climate conducive to new businesses and business growth (Sutter County 2010a:5-2). Sutter County has a labor force of 41,800, and its unemployment rate is 21.5% (California Employment Development Department 2010a).

Table 3.11-7. Total Full-Time and Part-Time Employment in Sutter County between 2001 and 2008

Employment by Industry	2001	2002	2003	2004	2005	2006	2007	2008
Total employment	40,171	40,109	41,098	41,561	41,972	43,067	44,561	44,316
Farm employment	4,000	4,099	4,146	3,735	2,947	2,602	2,873	2,655
Nonfarm employment	36,171	36,010	36,952	37,826	39,025	40,465	41,688	41,661
Private employment	31,774	31,648	32,625	33,424	34,639	35,885	37,005	36,888
Forestry, fishing, and related activities	1,465	1,408	1,507	1,407	1,625	1,613	1,607	1,482
Mining	93	99	116	96	108	129	167	251
Utilities	49	100	98	88	85	73	70	99
Construction	2,673	2,559	2,649	2,753	2,990	3,056	3,039	2,761
Manufacturing	2,379	1,785	1,844	1,813	1,820	1,804	1,900	1,908
Wholesale trade	1,178	1,366	1,170	1,298	1,252	1,340	1,458	1,338
Retail trade	5,696	5,931	6,130	6,094	6,326	6,711	6,797	6,561
Transportation and warehousing	1,428	1,356	1,324	1,267	1,330	1,427	1,683	1,714
Information	278	259	281	309	305	319	357	353
Finance and insurance	1,347	1,208	1,204	1,272	1,241	1,288	1,452	1,528
Real estate and rental and leasing	1,821	1,877	1,978	2,184	2,333	2,320	2,247	2,450
Professional, scientific, and technical services	(D)	1,547	1,644	1,760	1,839	1,793	1,845	1,922
Management of companies and enterprises	(D)	327	(D)	262	246	241	236	234
Administrative and waste services	1,710	1,663	2,131	2,229	2,468	2,766	2,722	2,544
Educational services	476	613	669	652	452	470	478	482
Health care and social assistance	3,660	3,941	4,021	4,237	4,455	4,660	4,847	5,010
Arts, entertainment, and recreation	671	676	(D)	715	696	725	757	811
Accommodation and food services	2,281	2,397	2,331	2,344	2,417	2,573	2,665	2,730
Other services, except public administration	2,631	2,536	2,540	2,644	2,651	2,577	2,678	2,710
Government and government enterprises	4,397	4,362	4,327	4,402	4,386	4,580	4,683	4,773
Federal, civilian	176	174	176	173	174	173	174	177
Military	151	152	154	154	147	147	146	151
State and local	4,070	4,036	3,997	4,075	4,065	4,260	4,363	4,445
State government	246	79	80	80	87	91	93	87
Local government	3,824	3,957	3,917	3,995	3,978	4,169	4,270	4,358

Source: Bureau of Economic Analysis 2010b.

Notes:

Estimates for 2001–2006 based on 2002 North American Industry Classification System (NAICS). Estimates for 2007 forward based on 2007 NAICS.

(D) = Not shown to avoid disclosure of confidential information but included in totals.

In 2008, total personal income in Sutter County was $3,067,966, and the per capita personal income was $33,301 (Bureau of Economic Analysis 2010a). For comparison, in 2009, total personal income in California was $1,564,388,897,000, and the per capita personal income was $42,325 (California Employment Development Department 2010b). As of 2010, food and agricultural production accounted for approximately 20% of the total economic output of all industries in Sutter County (Sutter County 2010b).

3.11.1.8 Butte County Socioeconomics

Agriculture is a major employment sector in Butte County (Butte County 2010:117). According to the Butte County General Plan 2030, in 2008 the estimated gross value of agricultural production countywide was approximately $580 million. Trends indicate that agriculture will maintain a strong position within Butte County's economy. The 2008 production value is an increase of almost $73 million over the 2007 production value.

Construction, health care, education, and government are other major employment sectors (Bureau of Economic Analysis 2010c; California Economic Development Partnership 2009b). Between 2001 and 2007, construction, retail, and education services were the fastest growing sectors in Butte County (California Economic Development Partnership 2009b) (Table 3.11-8). Occupational projections by the California Economic Development Partnership (2009b) indicate that the fastest growing occupations in the county are those involving pharmaceutical workers, home health care providers, and medical assistants. The county has a total labor force of 104,700, and its unemployment rate is 13.8% (California Employment Development Department 2010b).

Table 3.11-8. Total Full-Time and Part-Time Employment in Butte County between 2001 and 2008

Employment by Industry	2001	2002	2003	2004	2005	2006	2007	2008
Farm employment	3,909	4,092	3,785	3,491	3,166	2,974	3,181	3,270
Nonfarm employment	97,098	97,568	97,961	100,373	103,130	103,880	104,666	105,250
Private employment	81,406	81,539	81,925	84,672	87,092	87,696	88,344	89,098
Forestry, fishing, and related activities	1,406	1,384	1,360	(D)	1,446	1,264	1,356	1,366
Mining	116	92	95	(D)	80	117	130	157
Utilities	408	381	372	372	358	429	537	523
Construction	5,501	5,560	5,940	6,798	7,564	7,575	7,059	6,587
Manufacturing	5,300	4,646	4,635	4,790	4,855	4,831	5,016	4,995
Wholesale trade	1,976	2,046	2,180	2,520	2,425	2,441	2,558	2,417
Retail trade	12,868	13,359	13,231	13,178	13,606	13,750	13,514	13,171
Transportation and warehousing	2,435	2,514	2,063	2,195	2,205	2,220	2,187	2,196
Information	1,748	1,580	1,673	1,756	1,601	1,564	1,547	1,558
Finance and insurance	3,693	3,883	3,911	3,840	3,980	4,091	4,485	4,918
Real estate and rental and leasing	4,073	4,138	4,485	4,445	4,861	4,884	4,880	5,229
Professional, scientific, and technical services	4,831	4,777	5,025	5,329	5,538	5,558	5,737	5,818
Management of companies and enterprises	451	629	568	470	465	414	413	335
Administrative and waste services	5,730	5,842	4,928	4,879	4,828	4,724	4,493	4,542
Educational services	664	645	670	744	843	931	959	1,004
Health care and social assistance	13,265	13,227	14,094	14,501	14,683	14,889	15,206	15,772
Arts, entertainment, and recreation	2,005	2,045	1,985	2,079	2,111	2,120	2,241	2,332
Accommodation and food services	6,854	6,720	6,464	6,753	7,119	7,465	7,591	7,643
Other services, except public administration	8,082	8,071	8,246	8,543	8,524	8,429	8,435	8,535
Government and government enterprises	15,692	16,029	16,036	15,701	16,038	16,184	16,322	16,152
Federal, civilian	539	536	561	555	559	542	535	541
Military	390	391	396	387	369	365	361	361
State and local	14,763	15,102	15,079	14,759	15,110	15,277	15,426	15,250
State government	3,581	3,636	3,377	3,302	3,374	3,454	3,516	3,492
Local government	11,182	11,466	11,702	11,457	11,736	11,823	11,910	11,758

Source: Bureau of Economic Analysis 2010d.

Notes:

Estimates for 2001–2006 based on 2002 NAICS. Estimates for 2007 forward based on 2007 NAICS.

(D) = Not shown to avoid disclosure of confidential information but included in totals.

In 2008, total personal income in Butte County was $7,100,740, and the per capita personal income in Butte County was $32,349 (Bureau of Economic Analysis 2010c).

3.11.2 Environmental Consequences

This section describes the environmental consequences relating to agriculture, land use, and socioeconomics for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.11.2.1 Assessment Methods

This qualitative evaluation of agriculture, land use, and socioeconomics is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of the project.

The agriculture and land use evaluations are based on a review of the regulatory setting and environmental setting above, including review of the proposed project's compliance with Federal, state and local land use plans and regulations, and existing project area conditions. Key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of the proposed project.

Effects on socioeconomic conditions were evaluated qualitatively based on a review of the employment and project information outlined above and the criterion listed in Section 3.11.2.2, *Determination of Effects*. The proposed project was also evaluated for consistency with relevant socioeconomic plans and policies at the Federal, state, and local level, as applicable.

3.11.2.2 Determination of Effects

For this analysis, an effect pertaining to agriculture, land use, or socioeconomics was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

Agriculture

For the purposes of this analysis, effects on agriculture are considered significant if implementation of the proposed project would result in any of the following.

- Irretrievable conversion of a substantial acreage of prime farmland, unique farmland, or farmland of statewide importance.
- Conflicts with existing zoning for agricultural use, or a Williamson Act contract.
- Changes to the existing environment which, because of their location or nature, could result in substantial loss of crop production in the project area.

Land Use

For the purposes of this analysis, effects on land use are considered significant if implementation of the proposed project would result in any of the following.

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Implementation of the project would not physically divide an established community, as the affected rural areas do not constitute established communities and the structures that would be removed within Yuba City are located the edge of the city along the Feather River. Consequently, the first criterion above does not apply to the project and is not considered further in this analysis. Section 3.12, *Population, Housing, and Environmental Justice*, addresses the potential displacement of residents and businesses due to implementation of the proposed project.

Implementation of the project would not conflict with any applicable habitat conservation plan or natural community conservation plan, as both the Yuba-Sutter Natural Community Conservation Plan and Habitat Conservation Plan (Yuba-Sutter NCCP/HCP) and the Butte Regional Conservation Plan (BRCP) are currently in development but have not yet been adopted. Consequently, the third criterion above does not apply to the proposed project and is not considered further in this analysis.

Socioeconomics

For the purposes of this analysis, socioeconomic effects are considered significant if implementation of the proposed project would result in the following conditions.

- A substantial change in employment.
- Conflict with any applicable socioeconomic plan or policy.

3.11.3 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning agriculture, land use, and socioeconomics are summarized in Table 3.11-9.

Table 3.11-9. Summary of Effects for Agriculture, Land Use, and Socioeconomics

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities	Less than significant	None required	Less than significant
Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance	Less than significant	None required	Less than significant
Effect AG-3: Conflict with Existing Zoning for Agricultural Use	Less than significant	None required	Less than significant
Effect AG-4: Conflict with Williamson Act Contract	Less than significant	None required	Less than significant
Effect AG-5: Loss of Agricultural Production	Less than significant	None required	Less than significant
Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation	Less than significant	None required	Less than significant
Effect SOC-1: Employment Effects during Construction	Beneficial	None required	Beneficial
Effect SOC-2: Conflict with Applicable Socioeconomic Plan or Policy	Less than significant	None required	Less than significant

3.11.3.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions.

Agriculture

No construction-related effects to agriculture would occur under the No Action Alternative. However, because no levee improvements would be made under the No Action Alternative, the risk of levee failure and flooding along the Feather River West Levee would continue. Plates 2-13 through 2-19 show the areas subject to inundation from a potential 200-year flood event.

A flood event could have severe consequences for agriculture in the project area. Flooding could cause inundation, erosion, or sedimentation from high flows, destruction, or damage to agricultural equipment, outbuildings, and processing facilities, all of which could lead to reduced agricultural productivity. This damage could cause depression of the agricultural economy and cause abandonment of or prolonged delay in cultivation of productive lands, which could ultimately result in a change in the use of these lands that may be difficult to reverse. Clean-up and repair would likely take months or years after a large flood event, during which time the affected parcels would be temporarily unable to support agricultural uses. Additionally, the cost of cleanup and repair after

flooding could be too great to make restoring agricultural operations practicable. As the effects of levee failure on agriculture in the project area are unpredictable, a precise determination of significance cannot be made.

Land Use

No construction-related effects to land use would take place under the No Action Alternative, as no construction would occur. However, because no levee improvements would be made under the No Action Alternative, the risk of levee failure and flooding along the Feather River West Levee would continue. Plates 2-13 through 2-19 show the areas subject to inundation from a potential 200-year flood event.

A flood event could have severe consequences for land use in the project area. Flooding may substantially change the land uses in urban areas, both temporarily and permanently, and result in the physical division of established communities. A period of months or years would be required for clean-up and repair after a large flood event, during which time the affected parcels would be temporarily unable to support their designated land uses. Damages sustained by residential, commercial, civic, and industrial uses in areas inundated by flooding could be so great as to render the properties permanently unusable. Additionally, the cost of cleanup and repair after flooding could be too great to make restoring the current land use worthwhile, resulting in permanent changes to land use in the project area and potential division of established communities. As the effects of levee failure on project area land uses are unpredictable, a precise determination of significance cannot be made.

Socioeconomics

Under the No Action Alternative, none of the proposed project improvements would be implemented. Consequently, no socioeconomic effects associated with levee construction would occur because there would be no construction workforce utilized and, therefore, no increase in employment or change in local economic conditions. In addition, no changes to agricultural income related to project construction would take place. However, because no levee improvements would be made under the No Action Alternative, the risk of levee failure and flooding along the Feather River West Levee would continue. Plates 2-13 through 2-19 show the areas subject to inundation from a potential 200-year flood event. A flood event could have severe consequences for agriculture and land use in the project area, thereby affecting the project area's economic productivity. Flooding could cause inundation, erosion, or sedimentation from high flows, destruction, or damage to agricultural equipment, outbuildings, and processing facilities, all of which could lead to reduced agricultural productivity. Similar damage could occur to commercial and industrial uses in the project area. This damage could cause depression of the local economy. However, as the effects of levee failure on the economy are unpredictable, a precise determination of significance cannot be made.

3.11.3.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on agriculture, land use, and socioeconomics. These potential effects and related mitigation measure requirements are summarized in Table 3.11-10 and discussed below.

Table 3.11-10. Agriculture, Land Use, and Socioeconomic Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities	Less than significant	None required	Less than significant
Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance	Less than significant	None required	Less than significant
Effect AG-3: Conflict with Existing Zoning for Agricultural Use	Less than significant	None required	Less than significant
Effect AG-4: Conflict with Williamson Act Contract	Less than significant	None required	Less than significant
Effect AG-5: Loss of Agricultural Production	Less than significant	None required	Less than significant
Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation	Less than significant	None required	Less than significant
Effect SOC-1: Employment Effects during Construction	Beneficial	None required	Beneficial
Effect SOC-2: Conflict with Applicable Socioeconomic Plan or Policy	Less than significant	None required	Less than significant

Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities

During construction of Alternative 1, temporary staging areas to house construction materials and equipment would be necessary. Temporary earthen access ramps would also be built to facilitate construction activities and allow equipment to access the levees. Due to these construction requirements, implementation of Alternative 1 would temporarily convert up to 18.7 acres of prime farmland and 4.99 acres of farmland of statewide importance from agricultural use within Sutter County, as well as up to 11.77 acres of prime farmland within Butte County. However, all of this farmland in both Sutter County and Butte County would be returned to its original use after completion of project construction. The temporary conversion of this farmland constitutes a less-than-significant effect. No mitigation is required.

Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance

To accommodate the ~~flood control~~flood risk management facilities and improvements proposed under Alternative 1, 181.72 acres of prime farmland, 2.79 acres of unique farmland, and 36.37 acres of farmland of statewide importance in Sutter County and 82.49 acres of prime farmland and 3.08 acres of unique farmland in Butte County would be permanently converted to non-agricultural use. This acreage represents 0.11% of the prime farmland, 0.02% of the unique farmland, and 0.03% of the farmland of statewide importance acreage in Sutter County and 0.04% of the prime farmland and 0.01% of the unique farmland acreage in Butte County. The conversion of agricultural land under Alternative 1 would occur only in a narrow corridor adjacent to the existing levee, the remainder of the affected parcel feasible and economically viable for continued farming. Furthermore, the proposed improvements to the ~~flood control~~flood risk management system would benefit hundreds of thousands of acres of valuable agricultural land in Sutter and Butte Counties,

including prime farmland, unique farmland, and farmland of local importance, by providing increased protection from future flood damage. Consequently, the conversion of this farmland constitutes a less than significant effect. No mitigation is required.

Effect AG-3: Conflict with Existing Zoning for Agricultural Use

With the exception of the portions of the project area within and immediately adjacent to Yuba City along the Feather River, and Reach 41 immediately south of Thermalito Afterbay, lands along the project reaches are zoned for agricultural use. Flood risk management~~protection~~ measures and facilities are not specifically identified within any of the local zoning ordinances, but would constitute a public facility, which the local jurisdictions recognize as consistent with all zoning districts. Implementation of Alternative 1 would therefore not conflict with existing agricultural zoning. No mitigation is required.

Effect AG-4: Conflict with a Williamson Act Contract

Public agencies may acquire Williamson Act contracted land for a variety of public improvements, including water resource management, provided that there is no other non-contracted land reasonably feasible for the purpose, and that the lower cost of contracted land is not a primary factor in its decision.

No lands in the Sutter County portion of the project area are currently under Williamson Act contract; however, within Butte County, approximately 87.91 acres of contracted lands fall within the footprint of Alternative 1. Of these 87.91 acres, 83.02 acres would be permanently converted to flood risk management ~~protection~~ uses and 4.89 acres would be returned to agricultural use following project construction. Implementation of Alternative 1 would therefore conflict with Williamson Act contracts on 83.02 acres of land within Butte County. The 83.02 acres of Williamson Act lands that would be removed from contracts under Alternative 1 represent 0.04% of Butte County's contracted Williamson Act lands. Furthermore, the nature of the proposed project precludes consideration of lands in other areas. This constitutes a less-than-significant effect. No mitigation is required.

Effect AG-5: Loss of Agricultural Production

As discussed above for Effect AG-2, implementation of Alternative 1 would involve the permanent conversion of up to 401.24 acres of agricultural land within Sutter County and up to 186.22 acres of agricultural land within Butte County. This loss would primarily consist of orchard and field crop land. The loss of a total of 587.46 acres of productive agricultural land, with associated annual losses in agricultural production, would represent approximately 0.06% of the total agricultural land under production in Sutter and Butte Counties, a less than significant effect. No mitigation is required.

Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation

Construction of Alternative 1 would be generally consistent with the policies of the Sutter County , City of Yuba City , City of Live Oak , and Butte County general plans. These policy documents support the implementation of ~~flood control~~flood risk management operations where appropriate. ~~Flood control~~Flood risk management activities are typically considered public uses, which are largely consistent with the land use policies and regulations governing the project area. The consistency of

Alternative 1 with the relevant land use plans, policies and regulations would constitute a less-than-significant effect. No mitigation is required.

Effect SOC-1: Employment Effects during Construction

Construction activities associated with implementation of Alternative 1 would temporarily increase employment and personal income in the local area. Preliminary cost estimates indicate that total construction-related expenditures associated with Alternative 1 would be approximately $321,535,000 (HDR et al. 2011). This is an estimate of direct costs only, and does not include indirect or induced changes in employment and personal income resulting from project construction. Project construction would benefit the local economy by temporarily increasing employment and personal income. Although the increase in employment is not considered substantial when compared to total employment in the region, this effect on employment would be beneficial.

Effect SOC-2: Conflict with Applicable Land Use Plan, Policy, or Regulation

Construction of Alternative 1 would be generally consistent with the socioeconomic policies of the , City of Yuba City , City of Live Oak , and Butte County general plans. The consistency of Alternative 1 with the relevant socioeconomic plans, policies and regulations would constitute a less-than-significant effect. No mitigation is required.

3.11.3.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on agriculture, land use, and socioeconomics. These potential effects and related mitigation measure requirements are summarized in Table 3.11-11 and discussed below.

Table 3.11-11. Agriculture, Land Use, and Socioeconomic Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measures	With Mitigation
Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities	Less than significant	None required	Less than significant
Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance	Less than significant	None required	Less than significant
Effect AG-3: Conflict with Existing Zoning for Agricultural Use	Less than significant	None required	Less than significant
Effect AG-4: Conflict with Williamson Act Contract	Less than significant	None required	Less than significant
Effect AG-5: Loss of Agricultural Production	Less than significant	None required	Less than significant
Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation	Less than significant	None required	Less than significant
Effect SOC-1: Employment Effects during Construction	Beneficial	None required	Beneficial
Effect SOC-2: Conflict with Applicable Socioeconomic Plan or Policy	Less than significant	None required	Less than significant

Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities

During construction of Alternative 2, temporary staging areas to house construction materials and equipment would be necessary. Temporary earthen access ramps would also be built to facilitate construction activities and allow equipment to access the levees. Due to these construction requirements, implementation of Alternative 2 would temporarily convert 18.8 acres of prime farmland and 5.24 acres of farmland of statewide importance from agricultural use within Sutter County, as well as 12.11 acres of prime farmland within Butte County. However, all of this farmland would be returned to its original use after completion of project construction. The temporary conversion of this farmland constitutes a less-than-significant effect. No mitigation is required.

Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance

To accommodate the ~~flood control~~flood risk management facilities and improvements proposed under Alternative 2, 555.24 acres of prime farmland, 2.79 acres of unique farmland, and 117.87 acres of farmland of statewide importance in Sutter County and 166.78 acres of prime farmland, plus 3.19 acres of unique farmland in Butte County would be permanently converted to non-agricultural use. This acreage represents 0.34% of the prime farmland, 0.02% of the unique farmland, and 0.1% of the farmland of statewide importance acreage in Sutter County and 0.09% of the prime farmland and 0.01% of the unique farmland acreage in Butte County. The conversion of agricultural land under Alternative 2 would occur only in a narrow corridor adjacent to the existing levee, the remainder of the affected parcel feasible and economically viable for continued farming. Furthermore, the proposed improvements to the ~~flood control~~flood risk management system would benefit hundreds of thousands of acres of valuable agricultural land in Sutter and Butte Counties, including prime farmland, unique farmland, and farmland of local importance, by providing increased protection from future flood damage. Consequently, the conversion of this farmland constitutes a less-than-significant effect. No mitigation is required.

Effect AG-3: Conflict with Existing Zoning for Agricultural Use

With the exception of the portions of the project area within and immediately adjacent to Yuba City along the Feather River, and Reach 41 immediately south of Thermalito Afterbay, lands along the project reaches are zoned for agricultural use. Flood risk management~~protection~~ measures and facilities are not specifically identified within any of the local zoning ordinances, but would constitute a public facility, which the local jurisdictions recognize as consistent with all zoning districts. Implementation of Alternative 2 would therefore not conflict with existing agricultural zoning. No mitigation is required.

Effect AG-4: Conflict with a Williamson Act Contract

Public agencies may acquire Williamson Act contracted land for a variety of public improvements, including water resource management, provided that there is no other noncontracted land reasonably feasible for the purpose, and that the lower cost of contracted land is not a primary factor in its decision.

No lands in the Sutter County portion of the project area are currently under Williamson Act contract; however, within Butte County, 138.89 acres of contracted lands fall within the footprint of Alternative 2. Of these 138.89 acres, 133.99 acres would be permanently converted to flood risk

management ~~protection~~ uses and 4.9 acres would be returned to agricultural use following project construction. Implementation of Alternative 2 would therefore conflict with Williamson Act contracts on 133.99 acres of land within Butte County. The 133.99 acres of Williamson Act lands that would be removed from contracts under Alternative 2 represent 0.06% of Butte County's contracted Williamson Act lands. Furthermore, the nature of the proposed project precludes consideration of lands in other areas. This constitutes a less-than-significant effect. No mitigation is required.

Effect AG-5: Loss of Agricultural Production

As discussed above for Effect AG-2, implementation of Alternative 2 would involve the permanent conversion of up to 856.26 acres of agricultural land within Sutter County and up to 270.62 acres of agricultural land within Butte County. This loss would primarily consist of orchard and field crop land. The loss of a total of 1,126.88 acres of productive agricultural land, with associated annual losses in agricultural production, would represent approximately 0.1% of the total agricultural land under production in Sutter and Butte Counties, a less-than-significant effect. No mitigation is required.

Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation

Effect LU-1, Conflict with Applicable Land Use Plan, Policy, or Regulation, would be the same for Alternative 2 as discussed above for Alternative 1. Flood ~~control~~ risk management activities are typically considered public uses, which are largely consistent with the land use policies and regulations governing the project area. The consistency of Alternative 2 with the relevant land use plans, policies and regulations would constitute a less-than-significant effect. No mitigation is required.

Effect SOC-1: Employment Effects during Construction

Construction activities associated with implementation of Alternative 2 would temporarily increase employment and personal income in the local area. Preliminary cost estimates anticipate that total construction-related expenditures associated with Alternative 2 would be approximately $527,373,000 (HDR et al. 2011). This is an estimate of direct costs only, and does not include indirect/induced changes in employment and personal income resulting from project construction. Project construction would benefit the local economy by temporarily increasing employment and personal income. Although the increase in employment is not considered substantial when compared to total employment in the region, this effect on employment would be beneficial.

Effect SOC-2: Conflict with Applicable Land Use Plan, Policy, or Regulation

Construction of Alternative 2 would be generally consistent with the socioeconomic policies of the , City of Yuba City , City of Live Oak , and Butte County general plans. The consistency of Alternative 2 with the relevant socioeconomic plans, policies and regulations would constitute a less-than-significant effect. No mitigation is required.

3.11.3.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on agriculture, land use, and socioeconomics. These potential effects and related mitigation measure requirements are summarized in Table 3.11-12 and discussed below.

Table 3.11-12. Agriculture, Land Use, and Socioeconomic Effects, and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities	Less than significant	None required	Less than significant
Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance	Less than significant	None required	Less than significant
Effect AG-3: Conflict with Existing Zoning for Agricultural Use	Less than significant	None required	Less than significant
Effect AG-4: Conflict with Williamson Act Contract	Less than significant	None required	Less than significant
Effect AG-5: Loss of Agricultural Production	Less than significant	None required	Less than significant
Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation	Less than significant	None required	Less than significant
Effect SOC-1: Employment Effects during Construction	Beneficial	None required	Beneficial
Effect SOC-2: Conflict with Applicable Socioeconomic Plan or Policy	Less than significant	None required	Less than significant

Effect AG-1: Temporary Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Accommodate Construction Activities

During construction of Alternative 3, temporary staging areas to house construction materials and equipment would be necessary. Temporary earthen access ramps would also be built to facilitate construction activities and allow equipment to access the levees. Due to these construction requirements, implementation of Alternative 3 would temporarily convert 5.57 acres of prime farmland and 0.57 acre of farmland of statewide importance from agricultural use within Sutter County, as well as 8.2 acres of prime farmland and 0.25 acre of unique farmland within Butte County. However, all of this farmland would be returned to its original use after completion of project construction. The temporary conversion of this farmland constitutes a less-than-significant effect. No mitigation is required.

Effect AG-2: Irretrievable Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance

To accommodate the ~~flood control~~flood risk management facilities and improvements proposed under Alternative 3, 85.03 acres of prime farmland, 4.37 acres of unique farmland, and 13.83 acres of farmland of statewide importance in Sutter County and 41.38 acres of prime farmland as well as 4.65 acres of unique farmland in Butte County would be permanently converted to non-agricultural use. This acreage represents 0.05% of the prime farmland, 0.02% of the unique farmland, and 0.01% of the farmland of statewide importance acreage in Sutter County and 0.02% of the prime farmland and 0.02% of the unique farmland acreage in Butte County. The conversion of agricultural land under Alternative 3 would occur only in a narrow corridor adjacent to the existing levee, leaving the remainder of the affected parcel feasible and economically viable for continued farming.

In accordance with the FPPA, ICF (as proxy for USACE) coordinated with NRCS on Form NRCS-CPA-106 ("Farmland Conversion Impact Rating for Corridor Type Projects") to determine a Farmland

Conversion Impact Rating for Alternative 3. Projects are scored on a scale of 260 points, and under the FPPA, projects receiving a total score of less than 160 need not be given further consideration for protection and no alternative sites need to be evaluated. The Oroville regional NRCS office oversaw the scoring of the Butte County portion of the project and the Yuba City regional NRCS office oversaw the scoring of the Sutter County portion of the project. The completed forms are located at the end of this chapter (Figure 3.11-1). The total score for the Butte County portion of Alternative 3 is 124 points, and the total score for the Sutter County portion of Alternative 3 is 118 points. A score for Alternative 3 as a whole was determined as shown in Table 3.11-13 below, and totals 136 points. This score is below the threshold of 160, so under the FPPA, no further consideration for protection of agricultural land needs to be undertaken, and no alternative sites need to be evaluated.

In addition, the proposed improvements to the ~~flood control~~flood risk management system would benefit hundreds of thousands of acres of valuable agricultural land in Sutter and Butte Counties, including prime farmland, unique farmland, and farmland of local importance, by providing increased protection from future flood damage. Consequently, the conversion of this farmland constitutes a less-than-significant effect. No mitigation is required.

Table 3.11-13. Combined Farmland Conversion Impact Rating for Alternative 3

Category	Score
Land Evaluation (Relative Value of Farmland)[a]	**74**
Corridor Assessment	
1. Area in Nonurban Use	14
2. Perimeter in Nonurban Use	10
3. Percent of Corridor Being Farmed	0
4. Protection Provided by State and Local Government	20
5. Size of Present Farm Unit Compared to Average	10
6. Creation of Nonfarmable Farmland	0
7. Availability of Farm Support Services	5
8. On-Farm Investments	3
9. Effects of Conversion on Farm Support Services	0
10. Compatibility with Existing Agricultural Use	0
Total Corridor Assessment Points	**62**
Total Points (Land Evaluation plus Corridor Assessment)	**136**

[a] NRCS provided separate "Land Evaluation" scores for the portions of Alternative 3 in Sutter County and in Butte County. A combined "Land Evaluation" score for Alternative 3 was determined using a weighted average for the separate county scores. 71% of the project area is located in Sutter County and 29% of the project area is located in Butte County, so Sutter County's "Land Evaluation" score (79 points) makes up 71% of the combined "Land Evaluation" score and Butte County's score (60 points) makes up 29% for an average of 74 points.

Effect AG-3: Conflict with Existing Zoning for Agricultural Use

With the exception of the portions of the project area within and immediately adjacent to Yuba City along the Feather River, and Reach 41 immediately south of Thermalito Afterbay, lands along the project reaches are zoned for agricultural use. Flood risk management~~protection~~ measures and

facilities are not specifically identified within any of the local zoning ordinances, but would constitute a public facility, which the local jurisdictions recognize as consistent with all zoning districts. Implementation of Alternative 3 would therefore not conflict with existing agricultural zoning. No mitigation is required.

Effect AG-4: Conflict with a Williamson Act Contract

Public agencies may acquire Williamson Act contracted land for a variety of public improvements, including water resource management, provided that there is no other noncontracted land reasonably feasible for the purpose, and that the lower cost of contracted land is not a primary factor in its decision.

No lands in the Sutter County portion of the project area are currently under Williamson Act contract; however, within Butte County, approximately 81.32 acres of contracted lands fall within the footprint of Alternative 3. Of these 81.32 acres, 67.65 acres would be permanently converted to flood risk management ~~protection~~ uses and 13.67 acres would be returned to agricultural use following project construction. Implementation of Alternative 3 would therefore conflict with Williamson Act contracts on 67.65 acres of land within Butte County. The 67.65 acres of Williamson Act lands that would be removed from contracts under Alternative 3 represent 0.03% of Butte County's contracted Williamson Act lands. Furthermore, the nature of the proposed project precludes consideration of lands in other areas. This constitutes a less-than-significant effect. No mitigation is required.

Effect AG-5: Loss of Agricultural Production

As discussed above for Effect AG-2, implementation of Alternative 3 would involve the permanent conversion of up to 283.69 acres of agricultural land within Sutter County and up to 146.69 acres of agricultural land within Butte County. This loss would primarily consist of orchard and field crop land. The loss of a total of 430.38 acres of productive agricultural land, with associated annual losses in agricultural production, would represent less than 0.05% of the total agricultural land under production in Sutter and Butte Counties, a less-than-significant effect. No mitigation is required.

Effect LU-1: Conflict with Applicable Land Use Plan, Policy, or Regulation

Effect LU-1, Conflict with Applicable Land Use Plan, Policy, or Regulation, would be the same for Alternative 3 as discussed above for Alternative 1. Flood ~~control~~ risk management activities are typically considered public uses, which are largely consistent with the land use policies and regulations governing the project area. The consistency of Alternative 3 with the relevant land use plans, policies and regulations would constitute a less-than-significant effect. No mitigation is required.

Effect SOC-1: Employment Effects during Construction

Construction activities associated with implementation of Alternative 3 would temporarily increase employment and personal income in the local area. Preliminary cost estimates anticipate that total construction-related expenditures associated with Alternative 3 would be approximately $288,847,000 (HDR et al. 2011). This is an estimate of direct costs only, and does not include indirect/induced changes in employment and personal income resulting from project construction. Project construction would benefit the local economy by temporarily increasing employment and

personal income. Although the increase in employment is not considered substantial when compared to total employment in the region, this effect on employment would be beneficial.

Effect SOC-2: Conflict with Applicable Land Use Plan, Policy, or Regulation

Construction of Alternative 3 would be generally consistent with the socioeconomic policies of the Sutter County, City of Yuba City, City of Live Oak, and Butte County general plans. The consistency of Alternative 3 with the relevant socioeconomic plans, policies and regulations would constitute a less-than-significant effect. No mitigation is required.

3.12 Population, Housing, and Environmental Justice

3.12.1 Introduction

This section describes the regulatory and environmental setting for population, housing, and environmental justice; effects on population, housing, and environmental justice that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.12.2 Affected Environment

This section describes the affected environment for population, housing, and environmental justice in the project area. Following are the key sources of data and information used in the preparation of this section.

- Butte County General Plan 2030, Housing Element (Butte County 2010).
- City/County Population and Housing Estimates (California Department of Finance 2010).
- City of Biggs General Plan, Housing Element 2009-20014 (Pacific Municipal Consultants 2010).
- City of Gridley General Plan, Housing Plan (City of Gridley 2010).
- City of Live Oak General Plan, 2008-2013 Housing Element (City of Live Oak 2010).
- City of Yuba City 2008 Housing Element Update (Stuart and Graham 2009).
- Sutter County General Plan, 2008–2013 Housing Element (Sutter County 2010).
- American FactFinder (U.S. Census Bureau 2010).

3.12.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to population, housing, and environmental justice. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to population, housing, and environmental justice may apply to implementation of the proposed project.

Uniform Relocation Assistance and Real Property Acquisition Policies Act

Federal, state, and local government agencies and other agencies receiving Federal financial assistance for public programs and projects that require the acquisition of real property must comply with the policies and provisions set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in 1987 (42 USC 4601 et seq.) (Uniform Act), and implementing regulation, Title 49 CFR Part 24. Relocation advisory services, moving cost reimbursement, replacement housing, and reimbursement for related expenses and rights of appeal are provided for in the Uniform Act.

Executive Order 12898: Environmental Justice

Federal EO 12898, Environmental Justice, requires that, to the greatest extent practicable and permitted by law,

> …each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

EO 12898 charges each cabinet department to "make achieving environmental justice part of its mission," with the EPA responsible for implementation of EO 12898. The CEQ has oversight of the Federal government's compliance with Executive Order 12898 and NEPA.

For purposes of this analysis, the definitions of minority and low-income populations provided in the CEQ's Guidance for Agencies on Key Terms in Executive Order 12898 (Council on Environmental Quality 1997) are used.

- Minority individuals are defined as members of the following population groups.
  - American Indian or Alaskan Native.
  - Asian or Pacific Islander.
  - Black.
  - Hispanic.
- Minority populations are identified by the following.
  - Where the minority population percentage of the affected area is meaningfully greater than the minority population percentage of the general population.
  - Where the minority population percentage of the affected area exceeds 50% (Council on Environmental Quality 1997).
- Low-income populations are identified based upon poverty thresholds provided by the U.S. Census Bureau (Council on Environmental Quality 1997:25), and identified as one of the following.
  - The population percentage below the poverty level is meaningfully greater than that of the population percentage in the general population.
  - The population percentage below the poverty level in the affected area exceeds 50%.
- Significant concentrations of minority or low-income individuals are sometimes referred to as environmental justice populations.

State

The following state policies related to population, housing, and environmental justice may apply to implementation of the proposed project.

California Relocation Act

The State of California's Government Code Section 7260, et seq., brings the California Relocation Act into conformity with the Federal Uniform Act. In the acquisition of real property by a public agency, both the Federal and state acts seek to (1) ensure consistent and fair treatment of owners of real

property, (2) encourage and expedite acquisition by agreement to avoid litigation and relieve congestion in the courts, and (3) promote confidence in public land acquisition.

The Relocation Assistance and Real Property Acquisition Guidelines were established by 25 CCR 1.6. The guidelines were developed to assist public entities with developing regulations and procedures for implementing 42 USC 61—the Uniform Act, for Federal and federally assisted programs. The guidelines are designed to ensure that uniform, fair, and equitable treatment is given to people displaced from their homes, businesses, or farms as a result of the actions of a public entity. Under the Uniform Act, persons required to relocate temporarily are not considered "displaced," but must be reimbursed for all reasonable out-of-pocket expenses. In accordance with these guidelines, people would not suffer disproportionate injury as a result of action taken for the benefit of the public as a whole. Additionally, public entities must ensure consistent and fair treatment of owners of such property, and encourage and expedite acquisitions by agreement with displaced owners of property to avoid litigation.

Property acquisition and relocation services, compensation for living expenses for temporarily relocated residents, and negotiations regarding any compensation for temporary loss of business would be accomplished in accordance with the Uniform Act (see discussion above) and California Government Code Section 7267, et seq.

CEQA

Unlike Federal guidelines, CEQA does not require consideration of environmental justice.

General Plans

State law requires each city and county to adopt a general plan for its future growth. This plan must include a housing element that identifies housing needs for all economic segments and provide opportunities for housing development to meet those needs. At the state level, the Housing and Community Development Department estimates the relative share of California's projected population growth that would occur in each county presented by the Department of Finance's demographic research unit.

Each city and county must update its general plan housing element on a regular basis (usually every 5 years). Among other things, the housing element must incorporate policies and identify potential sites that would accommodate the city's and county's share of the regional housing need. Prior to adopting a general plan update for housing, the city or county must submit the draft to the Housing and Community Development Department for its review. The Housing and Community Development Department would take action to advise the local jurisdiction whether its housing element complies with provisions of California Housing Element Law. County and city housing elements in the planning area are described below.

Local

Sutter County, Butte County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley each have adopted goals and policies to promote housing that is affordable, safe, sanitary, efficient, and available at equal opportunity, detailed in Appendix A.

3.12.2.2 Environmental Setting

The following considerations are relevant to population, housing, and environmental justice conditions in the proposed project area.

Affected Area

The population, housing, and environmental justice affected area has been defined to include the 2010 U.S. Census of Population and Housing census tracts near the proposed project (U.S. Census 2010), and comprises the corridor along the Feather River west levee approximately 500 feet toward the land side and 100 feet toward the water side that stretches from the Thermalito Afterbay south for 41 miles. The corridor is shown on Plates 1-3a and 1-3b. The population, housing, and environmental justice affected area is intended to encompass an area where the potential population, housing, and environmental effects, if any, of construction and operation of the proposed project would be reasonably foreseeable. The affected area consists of 18 census tracts adjacent to the proposed project area and are located within Butte County and Sutter County.

Population

Butte County

The California Department of Finance provides population data estimates and projections for cities and counties throughout California. Between April 2000 and January 2010, the overall population of Butte County increased by 9.2%, growing from 203,171 to 221,768. For that same timeframe, the incorporated City of Gridley saw an increase of 19.3%, with the estimated population rising from 5,408 to 6,454. During that time, the City of Biggs saw a 0.9% decrease in population, going from 1,793 to 1,787. For comparison, the state's population rose 14.1% during the same period, from 33,873,086 to 38,648,090 (California Department of Finance 2010.) Although the county population has been increasing steadily, the population of the unincorporated portion of the county has been declining as people move to urban areas and cities' annex areas to accommodate this growth (Butte County 2010:32). According to the U.S. Census Bureau (2010), Butte County had a population density of approximately 134 persons per square mile, compared with the state average of 239 persons per square mile.

Sutter County

The California Department of Finance provides population data estimates and projections for cities and counties throughout California. Between April 2000 and January 2010, the overall population of Sutter County increased by 25.6%, growing from 78,930 to 99,154. For that same timeframe, the incorporated cities of Live Oak and Yuba City saw increases of 41.1% and 77.8%, respectively, with their estimated populations rising from 6,229 to 8,791 and 36,758 to 65,372. In contrast, the state's population rose more slowly at 14.1% during that time, as noted above (California Department of Finance 2010).

Sutter County is primarily rural, with extensive agricultural areas and a low population density (Sutter County 2010:4-16). Nearly two-thirds of the county's residents live in the incorporated cities of Live Oak and Yuba City (California Department of Finance 2010). According to the U.S. Census Bureau (2010), Sutter County had a population density of approximately 157 persons per square mile, compared with the state average of 239 persons per square mile.

Table 3.12-1 presents the latest race and ethnicity data from the U.S. Census Bureau (2010) for Butte County and Sutter County and affected census tracts in the affected area.

Table 3.12-1. Census 2010 Race and Ethnicity for Butte and Sutter Counties and the Affected Area

	Total Population for Which Data Were Compiled	White Alone	Black or African American Alone	American Indian and Alaskan Native Alone	Native Hawaiian and Other Pacific Islanders Alone	Asian Alone	Some Other Race Alone	Two or More Races Alone	Hispanic Ethnicity	Non-Hispanic Ethnicity
Butte County	220,000	180,096 (81.9%)	3,415 (1.6%)	4,395 (2.0%)	452 (0.2%)	9,057 (4.1%)	12,141 (5.5%)	10,444 (4.7%)	31,116 (14.1%)	188,884 (85.9%)
Affected Area [a]	*15,717*	*11,886* *75.6%*	*139* *0.9%*	*594* *3.8%*	*39* *0.2%*	*813* *5.2%*	*1,467* *9.3%*	*779* *5.0%*	*3,224* *(20.5%)*	*12,493* *(79.5%)*
CT 33	4,852	3,723 (76.7%)	59 (1.2%)	253 (5.2%)	7 (0.1%)	131 (2.7%)	396 (8.2%)	283 (5.8%)	785 (16.2%)	4,067 (83.8%)
CT 34	2,956	2,157 (73.0%)	8 (0.3%)	48 (1.6%)	0 (0.0%)	92 (3.1%)	518 (17.5%)	133 (4.5%)	1,091 (36.9%)	1,865 (63.1%)
CT 36	3,404	2,724 (80.0%)	30 (0.9%)	94 (2.8%)	2 (0.1%)	50 (1.5%)	369 (10.8%)	135 (4.0%)	847 (24.9%)	2,557 (75.1%)
CT 37	4,505	3,282 (72.9%)	42 (0.9%)	199 (4.4%)	30 (0.7%)	540 (12.0%)	184 (4.1%)	228 (5.1%)	501 (11.1%)	4,004 (88.9%)
Sutter County	94,737	57,749 (61.0%)	1,919 (2.0%)	1,365 (1.4%)	281 (0.3%)	13,663 (14.4%)	14,463 (15.3%)	5,297 (5.6%)	27,251 (28.8%)	67,486 (71.2%)
Affected Area [a]	*62,676*	*39,065* *(62.3%)*	*1,375* *(2.2%)*	*892* *(1.4%)*	*208* *(0.3%)*	*6,551* *(10.5%)*	*10,910* *(17.4%)*	*3,675* *(5.9%)*	*20,744* *(33.1%)*	*41,932* *(66.9%)*
CT 501.01	6,438	3,937 (61.2%)	285 (4.4%)	89 (1.4%)	32 (0.5%)	667 (10.4%)	969 (15.1%)	459 (7.1%)	1,831 (28.4%)	4,607 (71.6%)
CT 501.02	4,559	3,065 (67.2%)	130 (2.9%)	99 (2.2%)	22 (0.5%)	157 (3.4%)	788 (17.3%)	298 (6.5%)	1,549 (34.0%)	3,010 (66.0%)
CT 502.01	3,249	1,924 (59.2%)	60 (1.8%)	56 (1.7%)	11 (0.3%)	275 (8.5%)	702 (21.6%)	221 (6.8%)	1,410 (43.4%)	1,839 (56.6%)
CT 502.02	4,037	2,348 (58.2%)	102 (2.5%)	85 (2.1%)	14 (0.3%)	91 (2.3%)	1,148 (28.4%)	249 (6.2%)	2,102 (52.1%)	1,935 (47.9%)
CT 503.01	2,403	1,701 (70.8%)	33 (1.4%)	23 (1.0%)	13 (0.5%)	173 (7.2%)	307 (12.8%)	153 (6.4%)	561 (23.3%)	1,842 (76.7%)
CT 503.02	6,071	3,241 (53.4%)	111 (1.8%)	97 (1.6%)	10 (0.2%)	357 (5.9%)	1,880 (31.0%)	375 (6.2%)	3,396 (55.9%)	2,675 (44.1%)
CT 504.01	4,783	2,982 (62.3%)	87 (1.8%)	67 (1.4%)	14 (0.3%)	708 (14.8%)	604 (12.6%)	321 (6.7%)	1,149 (24.0%)	3,634 (76.0%)

	Total Population for Which Data Were Compiled	White Alone	Black or African American Alone	American Indian and Alaskan Native Alone	Native Hawaiian and Other Pacific Islanders Alone	Asian Alone	Some Other Race Alone	Two or More Races Alone	Hispanic Ethnicity	Non-Hispanic Ethnicity
CT 504.02	3,970	2,555 (64.4%)	95 (2.4%)	21 (0.5%)	28 (0.7%)	646 (16.3%)	390 (9.8%)	235 (5.9%)	805 (20.3%)	3,165 (79.7%)
CT 504.03	3,585	2,258 (63.0%)	114 (3.2%)	39 (1.1%)	19 (0.5%)	400 (11.2%)	501 (14.0%)	254 (7.1%)	937 (26.1%)	2,648 (73.9%)
CT 506.01	6,029	4,034 (66.9%)	98 (1.6%)	85 (1.4%)	13 (0.2%)	1,065 (17.7%)	481 (8.0%)	253 (4.2%)	973 (16.1%)	5,056 (83.9%)
CT 506.03	4,528	3,249 (71.8%)	93 (2.1%)	41 (0.9%)	7 (0.2%)	660 (14.6%)	272 (6.0%)	206 (4.5%)	561 (12.4%)	3,967 (87.6%)
CT 507.01	4,358	2,604 (59.8%)	25 (0.6%)	64 (1.5%)	13 (0.3%)	436 (10.0%)	1,025 (23.5%)	191 (4.4%)	1,896 (43.5%)	2,462 (56.5%)
CT 507.02	6,205	3,540 (57.1%)	118 (1.9%)	99 (1.6%)	11 (0.2%)	690 (11.1%)	1,389 (22.4%)	358 (5.8%)	2,732 (44.0%)	3,473 (56.0%)
CT 510	2,461	1,627 (66.1%)	24 (1.0%)	27 (1.1%)	1 (0.0%)	226 (9.2%)	454 (18.4%)	102 (4.1%)	842 (34.2%)	1,619 (65.8%)
Total Butte and Sutter Counties	*314,737*	*237,845 (75.6%)*	*5,334 (1.7%)*	*5,760 (1.8%)*	*733 (0.2%)*	*22,720 (7.2%)*	*26,604 (8.5%)*	*15,741 (5.0%)*	*58,367 (18.5%)*	*256,370 (81.5%)*
Total Affected Area[a]	*78,393*	*50,951 (65.0%)*	*1,514 (1.9%)*	*1,486 (1.9%)*	*247 (0.3%)*	*7,364 (9.4%)*	*12,377 (15.8%)*	*4,454 (5.7%)*	*23,968 (30.6%)*	*50,358 (64.2%)*

Source: U.S. Census Bureau 2010.

CT = Census Tract.

[a] The affected area consists of four census tracts in Butte County, and 14 census tracts in Sutter County, for a total of 18 census tracts.

Housing

Butte County

The number of housing units in Butte County continues to grow. The California Department of Finance (2010) estimates that Butte County had a total of 96,623 housing units in January 2010, up 1.3% from the 85,523 housing units in January 2000. The county's vacancy rate was 6.44% in 2010.

Housing stock also continued to grow in the cities of Biggs and Gridley. The California Department of Finance estimates that Biggs had 634 housing units and Gridley had 2,449 housing units in January 2010. These figures are up 3.4% and 24.1%, respectively, from the 613 and 1,973 total housing units in Biggs and Gridley in January 2000. The vacancy rate in Biggs was 6.62%, while the vacancy rate in Gridley was 6.17%, in 2010 (California Department of Finance 2010).

Sutter County

As the population of Sutter County grew, the county's housing stock grew as well. The California Department of Finance (2010) estimates that Sutter County had a total of 33,772 housing units in January 2010. This is up 19.3% from the 28,319 housing units in January 2000. The county's vacancy rate was 4.47% in 2010.

The California Department of Finance also estimates that housing stock grew in the cities of Live Oak and Yuba City. Live Oak had 2,427 housing units in January 2010. Yuba City had 22,706 housing units in January 2010. These figures are up 33.5% and 63.2%, respectively, from the 1,818 and 13,912 total housing units in Live Oak and Yuba City in January 2000. The vacancy rate in Live Oak was 4.99%, while the vacancy rate in Yuba City was 4.12% in 2010 (California Department of Finance 2010).

To supplement the summary of California Department of Finance estimates above, Table 3.12-2 presents the latest housing data from the U.S. Census Bureau (2010) for Butte and Sutter Counties and the affected area.

Table 3.12-2. Housing Data for Butte and Sutter Counties and the Affected Area (2010)

	Total Households	Average Household Size	Housing Units			Occupied Housing Units	
			Total	Occupied	Vacant	Owner Occupied	Renter Occupied
Butte County	87,618	2.46	95,835	87,618	8,217	50,991	36,627
Affected Area[a]	*5,625*	*2.86*[b]	*6,211*	*5,625*	*586*	*3,933*	*1,191*
CT 33	1,786	2.78	2,015	1,786	229	1,366	420
CT 34	1,023	2.89	1,133	1,023	110	585	438
CT 36	1,166	2.98	1,284	1,166	118	833	333
CT 37	1,650	2.80	1,779	1,650	129	1,149	501
Sutter County	31,437	2.99	33,858	31,437	2,421	19,212	12,225
Affected Area[a]	*21,038*	*2.98*[b]	*22,754*	*21,038*	*1,716*	*12,170*	*8,868*
CT 501.01	2,308	2.74	2,487	2,308	179	1,073	1,235
CT 501.02	1,779	2.51	1,974	1,779	195	581	1,198
CT 502.01	1,140	2.76	1,265	1,140	125	322	818
CT 502.02	1,405	2.74	1,578	1,405	173	382	1,023
CT 503.01	940	2.56	1,018	940	78	535	405
CT 503.02	1,820	3.27	2,004	1,820	184	721	1,099
CT 504.01	1,562	3.08	1,660	1,562	98	1,004	558
CT 504.02	1,285	3.08	1,363	1,285	78	959	326
CT 504.03	1,009	3.75	1,076	1,009	67	838	171
CT 506.01	2,040	3.07	2,170	2,040	130	1,648	392
CT 506.03	1,852	2.52	1,950	1,852	98	1,529	323
CT 507.01	1,342	3.29	1,438	1,342	96	927	415
CT 507.02	1,748	3.29	1,882	1,748	134	1,142	606
CT 510	808	3.10	889	808	81	509	299
Total Butte and Sutter Counties	*119,055*	*2.72*[c]	*129,693*	*119,055*	*10,638*	*70,203*	*48,852*
Total Affected Area[a]	*26,663*	*2.92*[d]	*28,965*	*26,663*	*2,302*	*16,103*	*10,059*

Source: U.S. Census Bureau 2010.

CT = Census Tract.

[a] The affected area consists of four census tracts in Butte County, and 14 census tracts in Sutter County, for a total of 18 census tracts.

[b] This number was obtained by averaging the average household size of the census tracts in the respective county planning area.

[c] This number was obtained by averaging the average household size for Butte and Sutter Counties.

[d] This number was obtained by averaging the average household size for Butte and Sutter Counties.

Income and Poverty Level

Income and poverty data from the American Community Survey (ACS) for Butte and Sutter Counties and the affected area are summarized in Table 3.12-3. For Census 2010, the ACS eliminated the decennial census long form on which it had collected income and poverty data in previous decennial census years, with income and poverty data as part of the decennial census. Now, income and

poverty data are collected only through the ACS, which collects information throughout the decade and publishes statistics yearly, rather than once every 10 years. At the time of writing, the most recent ACS data for the population, housing, and environmental justice affected area were the ACS 5-year estimates from 2006–2010.

Butte County

As shown in Table 3.12-3, per capita income in the Butte County portion of the affected area is $3,812 lower than in Butte County overall, which amounts to approximately 20% lower income in the Butte County affected area than in Butte County as a whole. In addition, the poverty rate in the Butte County affected area is 0.17% higher than in Butte County in its entirety.

Sutter County

Per capita income in the Sutter County portion of the affected area is $705 lower than in Sutter County overall (Table 3.12-3), which amounts to approximately 3% lower income in the Sutter County affected area than in Sutter County. In addition, the poverty rate in the Sutter County affected area is 4.07% higher than in Sutter County as a whole.

Table 3.12-3. Income and Poverty Data for Butte and Sutter Counties and the Affected Area (2006–2010)

Census Tract	Per Capita Income ($)[a]	Population for Whom Poverty Is Determined: Total[a]	Population for Whom Poverty Status Is Determined: Income below Poverty Level[a]
Butte County	23,404	213,501	39,290 (18.40%)
Affected Area[b]	19,592[c]	15,673	2,910 (18.57%)
CT 33	21,138	4,653	534 (11.48%)
CT 34	17,908	2,913	643 (22.07%)
CT 36	19,776	3,651	543 (14.87%)
CT 37	19,544	4,456	1,190 (26.71%)
Sutter County	22,344	92,477	13,194 (14.27%)
Affected Area[b]	21,639[c]	48,638	8,920 (18.34%)
CT 501.01	20,542	5,647	963 (17.05%)
CT 501.02	15,393	4,711	1,446 (30.69%)
CT 502.01	15,074	3,569	1,192 (33.40%)
CT 502.02	13,914	3,693	1,091 (29.54%)
CT 503.01	28,767	2,649	181 (6.83%)
CT 503.02	14,842	6,215	1,548 (24.91%)
CT 504.01	25,700	4,808	370 (7.70%)
CT 504.02	26,491	3,434	315 (9.17%)
CT 504.03	23,523	2,851	87 (3.05%)
CT 506.01	26,659	5,816	531 (9.13%)
CT 506.03	31,433	4,519	234 (5.18%)
CT 507.01	19,884	4,389	1,129 (25.72%)
CT 507.02	17,661	5,447	946 (17.37%)
CT 510	23,065	2,622	235 (8.96%)

Census Tract	Per Capita Income ($)[a]	Population for Whom Poverty Is Determined: Total[a]	Population for Whom Poverty Status Is Determined: Income below Poverty Level[a]
Butte and Sutter Counties	22,874[d]	305,978	52,484 (17.15%)
Affected Area[a]	20,615[e]	64,311	11,830 (18.39%)

Source: U.S. Census Bureau 2010.

[a] Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90% margin of error. The margin of error can be interpreted roughly as providing a 90% probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value.

[b] The affected area consists of four census tracts in Butte County, and 14 census tracts in Sutter County, for a total of 18 census tracts.

[c] This number was obtained by averaging the per capita income of the census tracts in the respective county affected area.

[d] This number was obtained by averaging the per capita income of Butte and Sutter Counties.

[e] This number was obtained by averaging the per capita income of the affected area in Butte and Sutter Counties.

3.12.3 Environmental Consequences

This section describes the environmental consequences relating to population, housing, and environmental justice for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.12.3.1 Assessment Methods

This evaluation of population, housing, and environmental justice is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction of this project.

Effects on population, housing, and environmental justice were evaluated qualitatively based on the criteria listed under Section 3.12.3.2, *Determination of Effects*.

The data that are pertinent to the analysis of population, housing, and environmental justice include race, housing, and income characteristics such as the following.

- Percent of minority population (Black or African American, American Indian and Alaskan Native, Asian, Native Hawaiian and Other Pacific Islander, and Hispanic).
- Total housing units.
- Vacant housing units.
- Per capita income.
- Percent of population below the U.S. Census poverty level.

Proposed project population, housing, and environmental justice effects were analyzed by comparing 2010 U.S. Census and ACS data for the affected area (four census tracts in Butte County and 14 census tracts in Sutter County) with data for Butte and Sutter Counties and by determining the percent of housing units displaced by each project alternative. In addition, geospatial analysis was used to determine the number of homes that would be affected by each project alternative. Affected census tracts in the affected area for which data were obtained were determined by using geospatial analysis and professional judgment. Census Tracts 502.01, 503.01, 504.01, and 506.01 are not intersected by the project boundary, but they were included in the affected area because of their proximity to small, adjacent census tracts that were intersected by the project boundary. This was done in case the proposed project affects these census tracts indirectly. For example, if residents currently residing in the small census tracts affected by the project boundary require relocation, they could be relocated to the census tract immediately adjacent to the affected census tract.

3.12.3.2 Determination of Effects

For this analysis, an effect pertaining to population and housing was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice. As noted above, only NEPA requires environmental justice analysis through Executive Order 12898.

- Displace people or existing housing.
- Result in a disproportionately high and adverse human health or environmental effect on minority populations and low-income populations.

3.12.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning population, housing, and environmental justice are summarized in Table 3.12-4.

Table 3.12-4. Summary of Effects for Population, Housing, and Environmental Justice

Effect	Finding	Mitigation Measure	With Mitigation
Alternatives 1, 2, and 3			
Effect POP-1: Displacement of Existing Housing Units	Significant	POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan	Less than significant
Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities	Less than significant	None required	Less than significant

3.12.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and ~~flood control~~flood risk management regimes relative to existing conditions.

Under the No Action Alternative, no displacement of housing units or people due to construction or operations and maintenance would occur. However, assuming that no levee repair or strengthening would occur under the No Action Alternative means that the levee would remain or become more susceptible to failure as a result of identified deficiencies. These conditions could cause portions of the levee system to fail, triggering widespread flooding, extensive damage to the affected area's existing residential structures, and potential loss of life and property. The magnitude of the flood damage would depend on the location of the levee breach, severity of the storm, and river flows at the time of a potential levee failure.

During the recovery period after a flood event, area residents would require temporary housing, and displacement of many or all occupants would occur while levees, buildings, and other infrastructure were repaired. According to the U.S. Census, there were 26,663 total households in the affected area as of 2010 (Table 3.12-2) (U.S. Census Bureau 2010) that could be affected by a flood event; it is possible that the number of households that could be affected by a flood event has increased since 2010. As of 2010, there were 2,302 vacant housing units in the affected area (Table 3.12-2). Therefore, the potential number of displaced residents resulting in demand for temporary quarters likely would exceed the available supply of vacant buildings surrounding the affected area. Thus, many displaced residents may be forced to relocate to areas a considerable distance from their communities in the affected area.

Because the magnitude of the flood damage would depend on the location of the levee breach, severity of the storm, and river flows at the time of a potential levee failure, a precise determination of significance cannot be made.

3.12.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on population, housing, and environmental justice. These potential effects and related mitigation measure requirements are summarized in Table 3.12-5 and discussed below.

Table 3.12-5. Population, Housing, and Environmental Justice Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measure	With Mitigation
Effect POP-1: Displacement of Existing Housing Units	Significant	POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan	Less than significant
Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities	Less than significant	None required	Less than significant

Effect POP-1: Displacement of Existing Housing Units

Implementation of Alternative 1 would require the permanent acquisition of five existing residences to accommodate the expanded footprint of the ~~flood control~~flood risk management system: two residences in Butte County (one each in Census Tracts 33 and 34) and three in Sutter County (two in Census Tract 502.02 and one in Census Tract 507.01). In some cases, project construction may result in temporary disruption of utilities (water, telephone, electricity, gas, and sanitary sewer), loss of

vehicle or pedestrian access for durations too lengthy for convenient day-to-day living, and/or construction-related noise. During some periods of time, construction activities may be directly adjacent to homes. If these circumstances occur, residents may voluntarily relocate during disruptive construction activities.

The displacement of any residences is considered a significant effect, so the permanent acquisition of five residences and the potential for temporary displacement of residents under Alternative 1 would be significant. However, with implementation of Mitigation Measure POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan, this effect would be reduced to a less than significant level.

Mitigation Measure POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan

Permanent acquisition, relocation, and compensation services will be conducted in compliance with Federal and state relocation laws, which are the Uniform Act of 1970 (42 USC 4601 et seq.) and implementing regulation, 49 CFR Part 24; and California Government Code Section 7267 et seq. These laws require that appropriate compensation be provided to displaced landowners and tenants, and that residents may be relocated to comparable replacement housing. A review of Census Tract information for the affected residences shows that there are adequate vacant residences (see Table 3.12-2) within the same Census Tracts for resident relocations.

In cases where project construction is temporarily disruptive to nearby residents, SBFCA will provide assistance for residents to relocate temporarily during construction activities and provide compensation to residents for reasonable rent and living expenses incurred as a result of relocation. SBFCA will develop a Temporary Resident Relocation Plan to guide temporary relocation services and compensation. The Temporary Resident Relocation Plan will, at a minimum, serve the following functions.

- Outline the process for providing notice of relocation.
- Provide guidelines for relocation services and compensation.
- Ensure that 24-hour security for vacated homes is provided.
- Provide for temporary occasional access of vacated homes by residents (for long-duration construction periods).
- Ensure all compensation and relocation activities are conducted in compliance with Federal and state relocation laws, which are identified above.
- Ensure that the Temporary Resident Relocation Plan in no way offsets, eliminates, or reduces rights to compensation and relocation assistance resulting from required property rights.
- Ensure that the properties are returned to the property owners in an undamaged, clean condition, unaffected by residual dust or debris, in a manner consistent with the condition of the property prior to commencement of construction.
- Provide for cleaning or restoration of affected property improvements.

Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities

Income and poverty data for Butte and Sutter Counties are summarized in Table 3.12-3. As shown in Table 3.12-3, the per capita income in Census Tract 34 is $1,684 less than the average per capita income in the Butte County affected area. In addition, the percentage of the population below the poverty level in Census Tract 34 is 3.5% greater than the percentage of the population below the poverty level in the Butte County affected area. The per capita income in Census Tract 502.02 is $7,725 less than the average per capita income in the Sutter County affected area, and the percentage of the population below the poverty line is 11.2% more than the average percentage of the population below the poverty line in the Sutter County affected area. This represents a substantial difference in income between Census Tract 502.02 and the Sutter County affected area. Per capita income in Census Tract 502.02 is approximately 36% less than in the Sutter County affected area, and the percentage of the population below the poverty line is greater than 10% more in Census Tract 502.02 than in the Sutter County affected area.

Two homes would be acquired in Census Tract 502.02, while only one home would be acquired in each of Census Tracts 33, 34, and 507.01. The majority of the population of Census Tract 502.02 is of Hispanic ethnicity; per capita income in Census Tract 502.02 is approximately 36% less than in the Sutter County affected area; and the percentage of the population below the poverty line is greater than 10% more in Census Tract 502.02 than in the Sutter County affected area. However, because the number of homes acquired in the other census tracts is comparable to those in Census Tract 502.02 (one versus two homes acquired, respectively), home acquisitions associated with Alternative 1 would not result in a disproportionately high and adverse environmental effect on minority populations and low-income populations from project operation. For the same reason, significant and unavoidable effects associated with Alternative 1 for other resources (specifically Section 3.5, *Air Quality,* and Section 3.7, *Noise*) would not result in a disproportionately high and adverse human health or environmental effect on minority populations and low-income populations. Therefore, this effect is less than significant.

Implementation of Alternative 1 would require the acquisition of 24 residences in Census Tract 502.02. This represents approximately 80% of the total homes acquired in the Sutter County affected area. As described above for Effect EJ-1, the majority of the population of Census Tract 502.02 is of Hispanic ethnicity (52.1%). In addition, per capita income in Census Tract 502.02 is approximately 36% less than in the Sutter County affected area, and the percentage of the population below the poverty line is greater than 10% more in Census Tract 502.02 than in the Sutter County affected area. This represents a disproportionately high and adverse effect on a minority and low-income population from implementation of Alternative 1, considering that only one or two homes would be acquired in other census tracts. This effect is considered less than significant for Alternative 1.

3.12.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on population, housing, and environmental justice. These potential effects and related mitigation measure requirements are summarized in Table 3.12-6 and discussed below.

Table 3.12-6. Population, Housing, and Environmental Justice Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measure	With Mitigation
Effect POP-1: Displacement of Existing Housing Units	Significant	POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan	Less than significant
Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities	Less than significant	None required	Less than significant

Effect POP-1: Displacement of Existing Housing Units

This effect would be similar to Effect POP-1 described under Alternative 1. Implementation of Alternative 2 would require the permanent acquisition of 17 residences to accommodate the expanded footprint of the ~~flood control~~flood risk management system: 5 in Butte County (Census Tract 36) and 12 in Sutter County (2 in Census Tract 510, 6 in Census Tract 504.03, 2 in Census Tract 502.02, 1 in Census Tract 507.02, and 1 in Census Tract 507.01). Temporary relocation of residents may also be necessary.

The displacement of any residences is considered a significant effect, so the permanent acquisition of 17 residences and the potential for temporary displacement of residences under Alternative 2 would be significant. However, with implementation of Mitigation Measure POP-MM-1, this effect would be reduced to a less than significant level.

Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities

As described for Effect POP-1, implementation of Alternative 2 would require the acquisition of 17 existing residences.

In Sutter County, six homes would be acquired in Census Tract 504.03, two homes would be acquired in Census Tract 502.02, two homes would be acquired in Census Tract 510 and one home would be acquired in both Census Tracts 507.02, and 507.01. The majority of the population of Census Tract 504.03 is of non-minority descent. Because the number of homes acquired in the other census tracts is less than those in Census Tract 504.03 (six versus one or two homes respectively), home acquisitions associated with Alternative 2 would not result in a disproportionately high and adverse environmental effect on minority populations and low-income populations from project operation. For the same reason, significant and unavoidable effects associated with Alternative 2 for other resources (specifically Section 3.5, *Air Quality,* and Section 3.7, *Noise*) would not result in a disproportionately high and adverse human health or environmental effect on minority populations and low-income populations. Therefore, this effect is less than significant.

3.12.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on population, housing, and environmental justice. These potential effects and related mitigation measure requirements are summarized in Table 3.12-7 and discussed below.

Table 3.12-7. Population, Housing, and Environmental Justice Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measure	With Mitigation
POP-1: Displacement of Existing Housing Units	Significant	POP-MM-1: Property Acquisition Compensation and Resident Relocation Plan	Less than significant
EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities	Less than significant	None required	Less than significant

Effect POP-1: Displacement of Existing Housing Units

This effect would be the same as Effect POP-1 described under Alternative 1. Implementation of Alternative 3 would require the permanent acquisition of five existing residences to accommodate the expanded footprint of the ~~flood control~~flood risk management system: two residences in Butte County (one each in Census Tracts 33 and 34) and three in Sutter County (two in Census Tract 502.02 and one in Census Tract 507.01). Temporary relocation of residents may also be necessary.

The displacement of any residences is considered a significant effect, so the permanent acquisition of five residences and the potential for temporary displacement of residences under Alternative 3 would be significant. However, with implementation of Mitigation Measure POP-MM-1, this effect would be reduced to a less than significant level.

Effect EJ-1: Result in a Disproportionately High and Adverse Human Health or Environmental Effect on Minority Populations and Low-Income Populations from Construction Activities

Two homes would be acquired in Census Tract 502.02, while only one home would be acquired in each of Census Tracts 33, 34, and 507.01. As described for the analysis of Alternative 2 for Effect EJ-1, the majority of the population of Census Tract 502.02 is of Hispanic ethnicity; per capita income in Census Tract 502.02 is approximately 36% less than in the Sutter County affected area; and the percentage of the population below the poverty line is greater than 10% more in Census Tract 502.02 than in the Sutter County affected area. However, because the number of homes acquired in the other census tracts is comparable to those in Census Tract 502.02 (one versus two homes acquired, respectively), home acquisitions associated with Alternative 3 would not result in a disproportionately high and adverse environmental effect on minority populations and low-income populations from project operation. For the same reason, significant and unavoidable effects associated with Alternative 3 for other resources (specifically Section 3.5, *Air Quality,* and Section 3.7, *Noise*) would not result in a disproportionately high and adverse human health or environmental effect on minority populations and low-income populations. Therefore, this effect is less than significant.

3.13 Visual Resources

3.13.1 Introduction

This section describes the regulatory and environmental setting for visual resources; effects on visual resources that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.13.2 Affected Environment

This section describes the affected environment for visual resources in the project area. Following are the key sources of data and information used in the preparation of this section.

- Sacramento, Delevan, Colusa, and Sutter National Wildlife Refuges Final Comprehensive Conservation Plan (U.S. Fish and Wildlife Service 2009).
- Sutter County General Plan (Sutter County 2011).
- City of Yuba City General Plan (City of Yuba 2004).
- Butte County General Plan 2030 (Butte County 2010).
- City of Live Oak 2030 General Plan (City of Live Oak 2010).
- Visual Resources Assessment Procedure for the U.S. Army Corps of Engineers (Smardon et al. 1988).

3.13.2.1 Regulatory Setting

This section discusses regulatory information that applies to visual resources. Additional regulatory information appears in Appendix A.

Federal and State

There are no Federal or state policies related to visual resources that apply to the implementation of the proposed project. Notably, there are no roadways in or near the project area that are designated in Federal or state plans as scenic highways worthy of protection for maintaining and enhancing scenic viewsheds. Accordingly, there would be no effects on a state scenic highway and this is not analyzed further.

Local

Sutter County, Butte County, City of Yuba City, and the City of Live Oak have each adopted general plan goals and policies aimed toward protecting visual resources; these are provided in Appendix A. It should be noted that visual resources tend to be associated with land use, cultural resources, and biological resources; accordingly, the regulatory information presented in Appendix A is more inclusive to recognize these relationships.

3.13.2.2 Environmental Setting

The following considerations are relevant to visual resources conditions in the proposed project area.

Concepts and Terminology

Identifying a project area's visual resources and conditions involves three steps:

1. Objective identification of the visual features (visual resources) of the landscape.
2. Assessment of the character and quality of those resources relative to overall regional visual character.
3. Determination of the importance to people, or sensitivity, of views of visual resources in the landscape.

Because evaluating visual effects is inherently subjective, Federal and professional standards and methods of visual assessment have been used to determine potential effects on aesthetic values of the project area (see Section 3.13.3, *Environmental Consequences*). The aesthetic value of an area is a measure of its visual character and quality, combined with the viewer response to the area (Federal Highway Administration 1988:26–27, 37–43, 63–72). Scenic quality can best be described as the overall impression that an individual viewer retains after driving through, walking through, or flying over an area (U.S. Bureau of Land Management 1980:2–3). Viewer response is a combination of viewer exposure and viewer sensitivity. Viewer exposure is a function of the number of viewers, number of views seen, distance of the viewers, and viewing duration. Viewer sensitivity relates to the extent of the public's concern for a particular viewshed. These terms and criteria are described in detail below.

Visual Character

Natural and artificial landscape features contribute to the visual character of an area or view. Visual character is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Urban features include those associated with landscape settlements and development, including roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly seasonally, even hourly, as weather, light, shadow, and elements that compose the viewshed change. The basic components used to describe visual character for most visual assessments are the elements of form, line, color, and texture of the landscape features (USDA Forest Service 1995:28–34, 1-2–1-15; Federal Highway Administration 1988:37–43). The appearance of the landscape is described in terms of the dominance of each of these components.

Visual Quality

Visual quality is evaluated using the well-established approach to visual analysis adopted by the Federal Highway Administration, employing the concepts of vividness, intactness, and unity (Federal Highway Administration 1988:46–59; Jones et al. 1975;682–713).

- *Vividness* is the visual power of landscape components or how memorable they are as they combine in striking and distinctive visual patterns.

- *Intactness* is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, and in natural settings.
- *Unity* is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the landscape.

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity, as modified by the visual sensitivity of the viewers. High-quality views are exceptionally vivid and relatively intact and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Viewer Exposure and Sensitivity

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity or concern is based on the visibility of resources in the landscape, proximity of viewers to the visual resource, elevation of viewers relative to the visual resource, frequency and duration of views, number of viewers, and type and expectations of individuals and viewer groups.

The importance of a view is related in part to the position of the viewer relative to the resource; therefore, visibility and visual dominance of landscape elements depend on their placement within the viewshed. A viewshed is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail) (Federal Highway Administration 1988:26–27). To identify the importance of views of a resource, a viewshed must be broken into distance zones of foreground, middleground, and background. Generally, the closer a resource is to the viewer, the more dominant the resource and the greater its importance to the viewer. Although distance zones in a viewshed may vary between different geographic regions or types of terrain, the standard foreground zone is 0.25 to 0.5 mile from the viewer, the middleground zone is from the foreground zone to 3 to 5 miles from the viewer, and the background zone is from the middleground to infinity (Jones et. al. 1975:688).

Visual sensitivity depends on the number and type of viewers and the frequency and duration of views. Visual sensitivity also is modified by viewer activity, awareness, and visual expectations in relation to the number of viewers and viewing duration. For example, visual sensitivity is generally higher for views seen by people who are driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work (USDA Forest Service 1995:3-3–3-13; Federal Highway Administration 1988:63–72; U.S. Soil Conservation Service 1978:3, 9, 12). Commuters and nonrecreational travelers typically have fleeting views and tend to focus on traffic, not on surrounding scenery; therefore, they generally are considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they generally are considered to have high visual sensitivity. Viewers using recreation trails and areas, scenic highways, and scenic overlooks usually are assessed as having high visual sensitivity.

Judgments of visual quality and viewer response must be made based on a regional frame of reference (U.S. Soil Conservation Service 1978:3). The same landform or visual resource appearing in different geographic areas could have a different degree of visual quality and sensitivity in each setting. For example, a small hill may be a significant visual element on a flat landscape but have very little significance in mountainous terrain.

Visual Character of the Region

This section discusses the existing conditions related to aesthetics in the project area. The project area is located in the region of California's Sacramento Valley (valley), with its northern extent beginning at the Thermalito Afterbay (approximately 2.5 miles north of Biggs), stretching approximately 41 miles south to approximately 4 miles north of where the Feather River enters the Sutter Bypass. Yuba City is the largest city in the project area and is connected by SR 99 to the smaller cities of Gridley and Live Oak. The city of Biggs in Butte County and the smaller communities of Peachton, Fagan, Sunset, Encinal, Sanders, Tierra Buena, and Nicolaus in Sutter County are located nearby, on local roadways off SR 99.

Agricultural land, planted predominantly with row crops and orchards, stretches for miles in the region. A patchwork of fields surrounds the suburban outskirts of cities and communities, separating developed areas. When haze is at a minimum, these fields offer expansive views that extend over agricultural fields and recent development in the foreground to the middleground and background. The Sutter Buttes can be seen vividly rising up from the flat valley floor in the background, based on the viewer's location in the landscape. Views of the Coast Range to the west are common. Background views to the Sierra Nevada foothills to the east are more rare because of atmospheric haze.

While much of the valley is still in agricultural production, agricultural land has been and continues to be converted to suburban land uses. This trend is evident around the outskirts of Yuba City, Gridley, and Live Oak. Smaller, agrarian communities have not experienced a great deal of new development or growth over the past decade. Development in the region is typified by a growing core of residential, commercial, and some industrial land uses, with agricultural fields surrounding the city outskirts. Older residential and commercial areas in the region are often distinct, with a wide variety of architectural styles, development layouts, and visual interest. Newer residential and commercial development, however, tends to be homogenous in nature, with similar architectural styles, building materials, plan layouts, and commercial entities; and development often lacks a distinctive character from one city to the next. Waterways and bypasses, both natural and human-made, aid in limiting development but lead to development spreading outward where vast acreage of agricultural land remains. This growth is slowly changing the visual character from rural to suburban.

Overall, a mix of developed and natural landscapes characterizes the project area. The landscape pattern is influenced by development expanding from older core areas along the major roadways. The waterways in the project area have different visual characteristics at a finer scale. Viewers in the region include residents, local business employees, roadway users, and recreational users. Areas that may be affected by the project alternatives are shown in Plate 1-3.

Visual Character and Quality of the Project Vicinity

To illustrate visual character, Plate 3.13-1 plots the locations of the representative photographs shown in the identified plates. For visual quality, Table 3.13-1 (see end of this section, page 3.13-2~~4~~5) details the rating of each reach under existing conditions and anticipated rating based on the project alternatives. Visual quality ratings are assigned for vividness, intactness, and unity on a scale of 0 to 7, with 7 being the highest quality.

In the project area, the Feather River has a wider floodplain with gravel bars and riparian vegetation to the north, and past mining activities located to the east and west. South of the mining areas, the

width of the floodplain varies (Plate 3.13-2, Photo 5). In wider areas, there is an elevated floodplain used for agricultural production, which is often defined by bends in the river (Plate 3.13-2, Photo 17). In narrower areas, the river supports a dense riparian vegetation corridor. The character of the river remains much the same until it enters the Sutter Bypass, where it closely follows Garden Highway on the east, with only a narrow band of riparian vegetation on either side, and a wide swath of agricultural fields between the river and the west levee. The Oroville Wildlife Management Area is supported by the northern portion of the Feather River, and Lake of the Woods State Wildlife Area is supported by the southern portion of the river.

As they flow toward the south, waterways in this region meander through agricultural fields and orchards, passing by several rural communities. Except where the Feather River passes through Yuba City, lands adjacent to project levee exteriors are predominantly agricultural fields and orchards, with the occasional rural residence or commercial facility located close to the levee (Plate 3.13-2, Photo 2 and 4). Where the Feather River passes through Yuba City, the land uses are primarily commercial, industrial, and residential. Public roadways, typically found adjacent to levees in this region, provide most of the views toward the project area. Foreground views near the river often consist of the waterway, levees, vegetation, surrounding agriculture, orchards, communities, docking areas, local roadways, and related infrastructure. Middleground and background views throughout the region may be limited by vegetation, levees, and infrastructure or may extend over the landscape to include views of the Sutter Buttes, Sierra Nevada, Coast Ranges, and a collage of agricultural fields and orchards (Plate 3.13-2, Photo 18).

Reaches

For purposes of discussion in this chapter, and to aid in understanding the numerous reaches in the project, the reaches have been divided into two categories based on, and defined by, similar existing visual characteristics, visual qualities, and associated viewer groups: rural reaches and urban reaches.

Rural Reaches

Rural reaches include portions of the project area where the adjacent land use is primarily large blocks of land used for agriculture. These agricultural fields are routinely leveled, disked, and planted in row crops or orchards. Consistency in the visual character is found by the common element of agriculture in the foreground and middleground. Along these rural reaches, a few individual rural residential home sites, often with secondary structures such as barns, are scattered throughout the project area. A small residential community is located south of E. Gridley Road and west of the Feather River levee in Reach 30.

Rural reaches comprise Reaches 2 through 11 (up to station 820+00) and Reaches 18 (beginning at station 1150+00) to 41. The numerous roadways in the rural reaches are generally two lanes with no curb, gutter, sidewalk, or street lights. These roads typically are not highly traveled and are used primarily for access to rural home sites or by vehicles or agricultural equipment used in farming operations.

While the character of these rural reaches is primarily agricultural, they do contain public recreation opportunities, as shown in Plate 3.14-1, *Existing Recreation Facilities near the Project Area*, including the Feather River Wildlife Areas (Nelson Slough Unit, O'Connor Lakes Unit, Abbot Lake Unit, and Morse Road Unit), Bobelaine Audubon Sanctuary, Boyd's Boat Ramp, Live Oak Park and Recreation Area, City of Gridley Boat Ramp, and the Oroville Wildlife Area. These public areas provide visual

and recreational opportunities to appreciate the river and its surrounding environment. Aside from those public areas, the rural reaches are defined by agricultural uses that stretch for miles.

As shown in Table 3.13-1 (page 3.13-24~~5~~), the overall visual quality of the rural reaches is moderate (3.5–4.3). Vividness (V=3.5–4), intactness (I=3.5–4.5), and unity (U=3.5–4.5) are moderate to moderately high because the vast amount of agricultural fields and orchards coupled with the mature vegetation along the river corridor provide a more unique and pleasing visual experience.

Photographs illustrating the visual character of the rural reaches are contained in Plate 3.13-2, Photos 1 through 7 and 12 through 17.

Urban Reaches

Urban reaches are those areas in the project area where the adjacent land uses have a higher density of residential, commercial, and industrial uses. The only urban reach in the project area is Yuba City, which includes Reach 11 (starting at station 820+00) through Reach 18 (ending at station 1150+00). Adjacent development in the project area for these reaches is composed of residential subdivisions; commercial and industrial uses; park, recreation, and open space land uses; and the Sutter County Airport. Along these reaches are significant roadways, such as SR 20 (Colusa Avenue), the Twin Cities Memorial Bridge, Shanghai Bend Road, 2nd Street, and Live Oak Boulevard.

As shown in Table 3.13-1 (page 3.13-24~~5~~), the overall visual quality of the urban reaches is moderately low to moderate (3.2–3.8). Vividness (V=2.5–3.5), intactness (I=3.5–4), and unity (U=3.5–4) are moderately low to moderate. This is because the contrasting built elements of Yuba City that combine with the Feather River corridor lack a coherent and harmonious visual pattern. The urbanization associated with Yuba City does not provide visual order; rather, it encroaches into the Feather River corridor.

Photos 8 through 11 in Plate 3.13-2 illustrate the visual character of the urban reaches.

Viewer Groups and Viewer Responses

The primary viewer groups in the project area include people living or conducting business near levees; travelers using highways and smaller local roads; and recreational users (including boaters and beachgoers along the Feather River; anglers using canals, creeks, and rivers; trail users; equestrians; bicyclists; and joggers).

Residents

Suburban and rural residences are located directly adjacent to levees or are separated from them by local streets or similar corridors. Suburban residences are mostly oriented inward toward the developments, and only residences on the outer edge of the developments have views of the levee, vegetation, and trees. At various locations the orientation of rural residences allows inhabitants to have direct views over agricultural fields toward the levee. Both suburban and rural residents are likely to have a high sense of ownership over the adjacent waterways, the surrounding open space, the recreational opportunities, and the inherent scenic quality. Residents are considered to have high sensitivity to changes in the viewshed because of their potential exposure to such views, proximity to the project area, and sense of ownership.

Businesses

Viewers from industrial, commercial, government, and educational facilities have semi-permanent views from their respective facilities. Situated in different locations throughout the project area, views from these facilities range from those limited by the levee to sweeping views that extend out to the background. Employees and users of these facilities are likely to be occupied with their work activities and tasks at hand. People using these facilities often travel to and from work and spend leisure time on the waterways and levee. Because of their limited viewing times, their focus on tasks at hand, and the current use of the levee, this viewer group is considered to have moderate sensitivity to changes in views.

Roadway Users

Roadway users' views differ based on the roadway they are traveling and elevation of that roadway. The majority of views are mostly limited to the foreground by suburban, commercial, and industrial development, vegetation, and the levee itself. Views to the middleground and background are present, but are limited to areas where structures that otherwise would conceal background views from the roadway are set back. However, if the roadway is elevated, as on portions of SR 20 and bridges crossing over the waterways, most views of the surrounding mountain ranges (Vaca Mountains, Coast Ranges, and Sierra Nevada), waterways (e.g., Feather River, Sutter Bypass when flooded), and open space areas (e.g., agriculture) are only partially obstructed by the rooflines and mature vegetation in the area. Roads on the levee associated with the project area are not open to the public and, therefore, would not provide public views of the project area.

Travelers use roadways at varying speeds. Normal highway and roadway speeds differ based on speed limits and the traveler's familiarity with the route and roadway conditions (e.g., presence or absence of rain). Single views typically are of short duration, except on straighter stretches where views last slightly longer. Viewers who frequently travel these routes generally possess moderate visual sensitivity to their surroundings. The passing landscape becomes familiar to these viewers, and their attention typically is focused on the roadway, roadway signs, and surrounding traffic, not on the passing views. Viewers who travel local routes for their scenic quality generally possess a higher visual sensitivity to their surroundings because they are likely to respond to the natural environment with a high regard and as a holistic visual experience. Furthermore, scenic stretches of roadway passing through the project area offer sweeping views of the surrounding area that are of interest to motorists, especially when traveling on the bridges or levee tops. For these reasons, viewer sensitivity is moderate among most roadway travelers.

Recreational Users

As described in Section 3.14, *Recreation*, there are numerous public access points to the Feather River in the project area. These destination spots provide passive and active recreation opportunities in the project area, and are adjacent to or within the footprint of the areas that would be directly affected by project alternatives. These destination spots are shown on Plate 3.14-1 and include the Feather River Wildlife Areas (Nelson Slough Unit, O'Connor Lakes Unit, Abbot Lake Unit, Shanghai Bend Unit, and Morse Road Unit), Bobelaine Audubon Sanctuary, Boyd's Boat Ramp, Peach Bowl Little League Field, Yuba City Boat Ramp, Live Oak Park and Recreation Area, City of Gridley Boat Ramp, and the Oroville Wildlife Area. These public amenities draw recreational viewer groups and provide visual opportunities to appreciate the river and surrounding environment.

Recreational users view the project area from parks, waterways, roadways, trails, and the levee itself. Recreational uses consist of boating and fishing; hunting in the bypasses; birding; and walking, running, jogging, and bicycling along trails, levee crowns, and local roads. Users of the waterways are likely to seek out natural areas within the corridor, such as sand and gravel bars and beaches, in addition to using the waterways as a resource. Waterway users have differing views based on their location in the landscape and are accustomed to variations in the level of land uses and activities occurring in the project area. The amount of vegetation present along the waterway creates a softened, natural edge that can be enjoyed by all recreational users. Local recreational users have a high sense of ownership over the waterways and corridors they use, and these areas are greatly valued throughout the project area.

Viewer sensitivity is high among recreational users in the project area because they are more likely to value the natural environment, appreciate the visual experience, have an enhanced sense of ownership, and be more sensitive to changes in views.

3.13.3 Environmental Consequences

This section describes the environmental consequences relating to visual resources for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.13.3.1 Assessment Methods

This evaluation of visual resources is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

The Visual Quality Rating Summary, provided in Table 3.13-1 (at the end of this section), was used to determine project effects. Vividness, intactness, and unity were evaluated to determine the existing visual quality of each reach and the proposed visual quality for all three alternatives. The Visual Quality Rating Summary also includes a brief description of affected viewers by reach.

3.13.3.2 Determination of Effects

For this analysis, an effect pertaining to visual resources was identified under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Cause a substantial, demonstrable negative aesthetic effect on a scenic vista or view open to the public.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare that would adversely affect day or nighttime public views.

Professional Standards

According to professional standards, a project may be considered to have an adverse (i.e., significant) effect if it would substantially:

- Conflict with local guidelines or goals related to visual quality.
- Alter the existing natural viewsheds, including changes in natural terrain.
- Alter the existing visual quality of the region or eliminate visual resources.
- Increase light and glare in the project vicinity.
- Result in backscatter light into the nighttime sky.
- Result in a reduction of sunlight or introduction of shadows in community areas.
- Obstruct or permanently reduce visually important features.
- Result in long-term (persisting for 2 years or more) adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity.

3.13.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning visual resources are summarized in Table 3.13-2.

Table 3.13-2. Summary of Effects for Visual Resources

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1 and 3			
Effect VIS-1: Result in Temporary Visual Effects from Construction	Less than significant	None required	Less than significant
Effect VIS-2: Adversely Affect a Scenic Vista	Less than significant	None required	Less than significant
Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings	Less than significant	None required	Less than significant
Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day and Nighttime Public Views	Less than significant	None required	Less than significant
Alternative 2			
Effect VIS-1: Result in Temporary Visual Effects from Construction	Significant and unavoidable	None available	Significant and unavoidable
All reaches			
Effect VIS-2: Adversely Affect a Scenic Vista			
Reaches 6, 12–15, 17, 24, 25–28, 34, 39; 2, 4, 16, 20, 22, 31–33, 35, 37, 38	Less than significant	None required	Less than significant
Reaches 3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, 41	Significant and unavoidable	None available	Significant and unavoidable

Effect	Finding	Mitigation Measures	With Mitigation
Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings			
Reaches 6, 12–15, 17, 24–29, 34, 39; 2, 4, 16, 20, 22, 31–33, 35, 37, 38	Less than significant	None required	Less than significant
Reaches 3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, 41	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day and Nighttime Public Views	Less than significant	None required	Less than significant
All reaches			

3.13.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and flood ~~control~~ risk management regimes relative to existing conditions. No levee improvements would be made to decrease flood risk. No construction-related effects relating to visual resources such as vegetation removal, displacement of agricultural land or development, or construction of a new levee, cutoff wall, and landside seepage and stability berms would occur.

As stated in Section 2.6.4, *Levee Vegetation Policy and No Action,* because of the existence of multiple future vegetation removal scenarios, the visual resources analysis examined the worst-case scenario—full application of the USACE levee vegetation policy. Full application of the policy is prohibition and removal of woody vegetation within the levee prism or within 15 feet of the landside or waterside levee toes. The degree of visual change in character and diminishment in visual quality from loss of the trees would be significant and unavoidable.

Without implementation of the proposed project alternatives, visual resources are expected to remain similar to existing conditions, aside from vegetation removal for USACE levee vegetation policy compliance. The visual character could change in the event of a levee failure. Catastrophic flooding has the potential to destroy vegetation, infrastructure, and development. However, current policy is to protect eroding sites during emergencies. Erosion on banks often has the potential to create small earthslides that take vegetation with them. However, this is part of a naturally functioning river system, and vegetation more often than not would recolonize such sites over time. These events often create areas of visual interest, but at erosion sites that are roughly 500 feet or larger, the loss of bank and vegetation due to erosion would be highly visible. Such a large site is likely to fall under emergency repair and would be repaired or revetted.

Without levee improvements, there is the continued risk of levee failure. Under-seepage and loss of levee foundation soils would be expected to continue. A catastrophic levee failure would result in collapse of levee slopes and loss of soil. This would result in flooding and inundation that could significantly damage existing facilities and infrastructure and uproot and kill vegetation to an unknown extent. Should such an event occur, natural processes and vegetative succession would restore the visual environment to a certain degree over time. However, permanent scarring or visual remnants of damaged infrastructure could remain on the landscape. Such an event would cause a

change in the existing visual character and potentially could lay waste to miles of land. Scenic vistas would be significantly altered for an extended period of time, or irreparably damaged, because views across this landscape would be so changed.

The necessary cleanup after such an event would introduce considerable heavy equipment and associated vehicles, including bulldozers, excavators, water trucks, and haul trucks, into the viewshed. The visual effect of these activities would not be significant because of the temporary nature of such activities.

Given the extent of catastrophic levee failure and the number of people affected, views of a barren or destroyed landscape could invoke deep emotional responses in viewers. Such views would reduce the visual enjoyment of areas that were once well regarded. The potential effects cannot be quantified based on available information but can be equated to such failures in recent history.

Furthermore, if lesser events such as a levee breach were to occur, emergency construction and repair activities would be implemented without the use of BMPs and could result in similar adverse effects, described under the alternatives below.

3.13.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on visual resources. These potential effects and related mitigation measure requirements are summarized in Table 3.13-3 and discussed below.

As stated in Chapter 2, *Alternatives*, and described in Section 3.8, *Vegetation and Wetlands*, for all three alternatives , existing trees and encroachments would be removed along the levee prism to the extent necessary to facilitate construction of the project. These areas are identified within the temporary and permanent effect boundaries on Plate 3.8-1 and would be void of vegetation except for erosion-controlling grasses. These areas are termed vegetation free zones (VFZ) in this section.

Table 3.13-3. Visual Resources Effects and Mitigation Measures for Alternative 1

Effect	Reach	Finding	Mitigation Measures	With Mitigation
Effect VIS-1: Result in Temporary Visual Effects from Construction	All reaches	Less than significant	None required	Less than significant
Effect VIS-2: Adversely Affect a Scenic Vista	All reaches	Less than significant	None required	Less than significant
Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings	All reaches	Less than significant	None required	Less than significant
Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day and Nighttime Public Views	All reaches	Less than significant	None required	Less than significant

Effect VIS-1: Result in Temporary Visual Effects from Construction

Construction in both rural and urban reaches would occur during more than one construction season (typically April 15 to November 30, subject to conditions). It is anticipated that construction would start in 2013 and continue through 2015. Construction is anticipated to occur in single

10-hour shifts, 6 days a week. An exception to this schedule is the cutoff wall construction, which is anticipated to occur in two 10-hour shifts (essentially 24-hour construction), 6 days a week. This would adversely affect residential viewers close to 20-hour construction activities.

High-powered lighting would be required for construction operations past sunset, visible to nearby residents who may be inside their homes or outside in their yards during the spring and summer months. However, Environmental Commitment 2.4.8 *Construction near Residences*, would ensure that high-power lighting is not used near sensitive residential viewers. In general, construction operations at the levee and borrow sites, construction traffic, haul trucks, and staging areas would be visible in the foreground and middleground to residents, businesses, roadway users, and recreationists.

Construction of the project would require clearing, grubbing, and stripping the construction site, and constructing temporary facilities such as staging areas and slurry mixing areas. The project would introduce heavy equipment, including long-reach track hoes, dump trucks, loaders, bulldozers, excavators, rough terrain forklifts, compactors, and water trucks. Construction has the potential to create dust and would introduce heavy equipment and associated vehicles into foreground views from the rural and urban residences, businesses in the rural and urban reaches, and those traveling along the nearby roadways. Dust control would be implemented during construction to reduce the potential for dust that would attract attention from visual receptors and reduce the availability of foreground and middleground views. Viewers are accustomed to seeing heavy machinery associated with agricultural operations, but viewers would not be accustomed to seeing intense construction activities because levee construction of this scale is not common in the project area.

In the rural reaches, construction would consist of a cutoff wall along all reaches and a landside seepage berm. The cutoff wall would be constructed along the centerline of the existing levee footprint to varying depths. While the visual effects associated with the construction of a cutoff wall would be minimal, the seepage berm would result in the removal of agricultural land planted in orchards. Furthermore, the seepage berm would result in expanding the levee footprint in near view of two rural residences, one located at the terminus of Ashford Avenue and the second at the terminus of O'Connor Avenue. Views from both properties would be affected by this new landform void of woody vegetation. However, Environmental Commitment 2.4.9.1 ~~2.4.1.5~~ *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage berm and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays.

To construct the seepage berm, material must be generated from borrow sites and hauled to the construction sites. This has the potential to create large landscape scars at borrow sites. However, Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan*, would improve the aesthetics of borrow sites by reclaiming and restoring borrow sites in a manner that returns the land to agricultural uses or creates natural habitat, recreational, developed, and/or mixed uses. At the construction sites, heavy equipment such as bulldozers, front-end loaders, haul trucks, motor-graders, sheepsfoot rollers, and water trucks would be visible during the construction period. Haul trucks would be seen transporting borrow material to the construction site. This activity, which is not consistent with agricultural operations, would attract attention and be visually out of character, disrupting the visual quality of the project area.

In the urban reaches, construction would consist primarily of cutoff walls.

In Reaches 6, 12, 14, 25, 29, and 39, construction would include replacement or relocation of underground features such as storm drains, sewer and irrigation pipelines. Once constructed, the ground surface would be restored and reseeded and appear consistent with existing, pre-disturbance conditions.

PG&E would also need to relocate existing gas transmission and distribution pipelines and electric transmission and distribution lines, as requested by SBFCA, to facilitate levee rehabilitation. Relocation of the electric transmission and distribution lines would occur in conjunction with other construction activities, described above, and would not add to the level of effect from the presence of construction activities. Once constructed, the ground surface would be restored and reseeded and would help to restore existing, pre-disturbance visual conditions. However, removal of trees and shrubs would occur from up to 30 feet from the levee toe to accommodate relocation; in some instances, vegetation removal may need to occur at a distance greater than 30 feet where existing poles are already further away from the levee toe. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from tree and shrub removal are less than significant.

Visual changes resulting from construction are considered short-term and temporary. Equipment would work in one area for a short period of time (typically a matter of days or less for any individual property and receptor group) and then move to a new location along the alignment, and each reach would typically include work only for a single construction season. Therefore, temporary visual effects during construction of Alternative 1 would be considered less than significant.

Effect VIS-2: Adversely Affect a Scenic Vista

The river and numerous roadways throughout the project area offer scenic vistas of contrasting landscape features. Development associated with Yuba City and the expansive agricultural fields are softened by the riparian corridors that line the river. Vistas from the river would be affected by vegetation removal (VFZ); however, removal of vegetation could create new vistas.

In Reaches 6, 12, 14, 25, 29, and 39, all project features would be located underground and would not be visible to the public. Therefore, effects on scenic vistas would be less than significant for these reaches.

In Reaches 2, 4, 11, 13, 15, 17–21, 24, 26–28, and 32–38, the cutoff wall would be contained within the levee's existing footprint. In Reaches 26–28, the landside slope of the levee would also need to be reconstructed. The cutoff wall and reconstructed slopes would not result in a noticeable change in the appearance of the levee, and these changes would not affect sensitive viewers. Vegetation in the VFZ would be cleared and these areas would be revegetated with grasses, but a limited number of sensitive viewers have visual access to these reaches. The overall visual quality in these reaches would not change.

In Reaches 3, 5, 7–10, 16, 22, 23, 30, 31, 40, and 41, vegetation removal in the VFZ would be the most dominant visual change. In addition, the new seepage berm in Reach 5 would introduce a large mass into foreground views in place of agricultural orchards now viewed from two residential properties. These changes would be considerable because of the physical modification being made to the levee but would result in a minor reduction in the overall visual quality because there are limited sensitive viewers with visual access to those reaches. However, Environmental Commitment 2.4.9.1 *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the

seepage berm and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches. Therefore, effects on scenic vistas would be less than significant for these reaches.

Relocation of PG&E electric transmission and distribution lines would only shift an existing visual element within the landscape, would not introduce new or unfamiliar visual elements. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from vegetation removal would not result in significant effects on scenic vistas. Therefore, effects would be less than significant.

While final soil borrow sites have not been selected, it is unlikely that scenic vistas would be adversely affected because the activity would take place below the surrounding land surface and therefore would not obstruct views; and because borrow sites would be restored to pre-borrow or similar land use, as identified in Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan*.

Ongoing maintenance would be similar to existing levee maintenance and would not result in significant effects.

Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings

In Reaches 6, 12, 14, 25, 29, and 39, all project features would be located underground and would not be visible to the public. Therefore, effects on the existing visual character and quality of the site would be less than significant for these reaches.

In Reaches 2, 4, 11, 13, 15, 17–21, 24, 26–28, and 32–38, the cutoff wall would be contained within the levee's existing footprint. In Reaches 26–28, the landside slope of the levee also would need to be reconstructed. The cutoff wall and reconstructed slopes would not result in a noticeable change in the appearance of the levee, and these changes would not affect sensitive viewers. Vegetation in the VFZ would be cleared, and these areas would be revegetated with grasses, but a limited number of sensitive viewers have visual access to these reaches. The overall visual quality in these reaches would not change. Therefore, effects would be less than significant for these reaches.

In Reaches 3, 5, 7–10, 16, 22, 23, 30, 31, 40, and 41, vegetation removal in the VFZ would be the most dominant visual change. In addition, while a cutoff wall within the existing levee footprint would not alter or degrade the existing visual character or quality of the site and its surroundings, this alternative would introduce a seepage berm into the viewshed of all viewer groups in and near Reach 5. Roadway users traveling along O'Connor Avenue and Ashford Avenue and two residences would have views of this new land form. All vegetation in the VFZ would be cleared, and these areas would be revegetated with grasses. After the project is constructed, these viewers would see a large berm with only grass as vegetation where agricultural fields or woody vegetation once existed, resulting in a change in visual character and reduction in quality.

In Reach 22, a portion of the levee would need to be completely reconstructed but would not greatly alter the permanent visual character because there is already a levee at this location; vegetation removal in this area, however, would be substantial.

Removal of vegetation in the VFZ and construction of the landside seepage berm constitute a significant visual change and would alter the viewshed from one that is vegetated with row crops,

orchards, grasses, large trees, and shrubs to one that is vegetated only with grasses. However, Environmental Commitment 2.4.9.1 *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage berm and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches. These changes in views would be perceived by residents, businesses, roadway users, and recreational viewer groups. However, a limited number of viewers are present, as identified in Table 3.13-1 (page 3.13-245). The changes in these reaches would be substantial because of the type of physical changes being made to the levee and vegetated areas, but a limited number of sensitive viewers have visual access to those reaches. Therefore, effects would be less than significant for these reaches.

Relocation of PG&E electric transmission and distribution lines would only shift an existing visual element within the landscape, would not introduce new or unfamiliar visual elements. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from vegetation removal would not result in significant effects on the existing visual character and quality. Therefore, effects would be less than significant.

While final soil borrow sites have not been selected, it is unlikely that scenic character and quality would be substantially degraded because borrow sites would be restored to pre-borrow or similar land use, essentially retaining existing character and quality, as identified in Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan*.

Ongoing maintenance would be similar to existing levee maintenance and would not result in significant effects.

Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day or Nighttime Public Views

The project would not introduce any permanent sources of illumination or reflective surfaces and therefore would result in no change in nighttime light or daytime glare.

3.13.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on visual resources. These potential effects and related mitigation measure requirements are summarized in Table 3.13-4 and discussed below.

Table 3.13-4. Visual Resources Effects and Mitigation Measures for Alternative 2

Effect	Reach	Finding	Mitigation Measure	With Mitigation
Effect VIS-1: Result in Temporary Visual Effects from Construction	All reaches	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-2: Adversely Affect a Scenic Vista	6, 12–15, 17, 24, 25–28, 34, 39	Less than significant	None required	Less than significant
	2, 4, 16, 20, 22, 31–33, 35, 37, 38	Less than significant	None required	Less than significant
	3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, 41	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings	6, 12–15, 17, 24–29, 34, 39	Less than significant	None required	Less than significant
	2, 4, 16, 20, 22, 31–33, 35, 37, 38	Less than significant	None required	Less than significant
	3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, 41	Significant and unavoidable	None available	Significant and unavoidable
Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day and Nighttime Public Views	All reaches	Less than significant	None required	Less than significant

Effect VIS-1: Result in Temporary Visual Effects from Construction

This effect under Alternative 2 is similar to the effect under Alternative 1, except as discussed below.

Alternative 2 would include construction of seepage and stability berms along the landside toe of the levee and cutoff walls along certain portions of the project. Similar to Alternative 1, all existing vegetation would be removed in the VFZ within the direct footprint necessary to construct the project.

This alternative, compared to Alternatives 1 and 3, would require the greatest amount of construction, over the largest area, and would result in the largest expansion of the overall levee footprint. Similar to Alternative 1, the construction of cutoff walls along certain reaches is proposed under Alternative 2. There would be fewer cutoff walls under Alternative 2 than under Alternative 1. Construction of the seepage and stability berms would displace more agricultural fields, residences, and small businesses than under Alternatives 1 and 3. Thus, Alternative 2 would result in greater effects than Alternatives 1 and 3.

In the rural reaches, a considerable amount of agricultural land would be converted to expansive seepage and stability berms located adjacent to the existing levee. There would be significant loss of residential and secondary structures, and businesses (Reaches 3, 8, 9, 10, 11, 18, 19, 20, 22, 23, 30, 31, 32, 33, 35, 36, 37, 38, and 40). Garden Highway would be realigned in Reach 10.

In the urban reaches, this alternative would result in the loss of numerous residential, commercial, and industrial structures. In addition, this alternative would require the realignment of urban roadways to accommodate the proposed improvements. The effects of this alternative would be significant in the urban reaches because of the adjacent higher density of residential, commercial, retail, and industrial land uses.

Construction of the landside seepage and stability berms would have significant effects because of the size of the berms, the amount of vegetation removal, and earthmoving activities during construction. However, Environmental Commitment 2.4.9.1 *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage and stability berms and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches. Cutoff walls, where applicable, would be installed during construction of the adjacent seepage and stability berms and, thus, would not appear to be a visually separate feature during construction but a part of the overall construction activities. The introduction of seepage and stability berms would result in the removal of agricultural land, demolition of structures and roadways, and the introduction of expansive manipulated landforms of low visual quality. Construction of the seepage and stability berms would be visible to nearby residents, businesses, roadway users, and recreationists.

Under this alternative, PG&E would also need to relocate existing gas transmission and distribution pipelines and electric transmission and distribution lines, as requested by SBFCA, to facilitate levee rehabilitation. Relocation of the electric transmission and distribution lines would occur in conjunction with other construction activities, described above, and would not add to the level of effect from the presence of construction activities. Once constructed, the ground surface would be restored and reseeded and would help to restore existing, pre-disturbance visual conditions. However, removal of trees and shrubs would occur from up to 30 feet from the levee toe to accommodate relocation; in some instances, vegetation removal may need to occur at a distance greater than 30 feet where existing poles are already further away from the levee toe. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from tree and shrub removal are less than significant.

Alternative 2 would require more soil borrow and likely more borrow sites than Alternatives 1 or 3. This has the potential to create large landscape scars at borrow sites. However, Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan*, would improve the aesthetics of borrow sites by reclaiming and restoring borrow sites in a manner that returns the land to agricultural uses or creates natural habitat, recreational, developed, and/or mixed uses. In addition, construction activities at the soil borrow sites and the increased presence of haul trucks would be visible to all nearby viewer groups, causing greater disruption in the visual character of the area than under the other alternatives.

Similar to Alternative 1, while construction would be temporary (equipment would work in one area for a period of time and then move to a new location along the alignment), visual effects would be significant because of the proximity to highly sensitive residential viewers, roadway users, and recreationists. In addition, the disturbance area and duration of the work would be considerably greater for Alternative 2 than for Alternatives 1 and 3, and would result in more substantial significant effects on visual resources from construction, especially to residences which are considered highly sensitive viewers. The magnitude of this effect is considered significant and unavoidable. Because these effects are inherent to the nature of the construction, no feasible mitigation is available.

Effect VIS-2: Adversely Affect a Scenic Vista

The river and numerous roadways throughout the project area offer scenic vistas of contrasting landscape features. Development associated with Yuba City and the expansive agricultural fields are

softened by the riparian corridors that line the river. Vistas from the river would be affected by vegetation removal (VFZ); however, removal of vegetation could create new vistas. Vistas in the urban reaches would be adversely affected under Alternative 2 much more so than under Alternatives 1 and 3. Alternative 2 proposes cutoff walls and seepage and stability berms in the urban reaches, while Alternative 1 proposes only cutoff walls.

In Reaches 6, 12, 14, 25, 29, and 39, all project features would be located underground and would not be visible to the public. Therefore, effects on scenic vistas would be less than significant for these reaches.

In Reaches 13, 17, 24, 26–28, and 34, the cutoff wall would be contained within the levee's existing footprint. In Reaches 24 and 26–28, the canal would be filled, but it is not immediately visible to sensitive viewers. The cutoff wall and reconstructed slopes would not result in a noticeable change in the appearance of the levee, and these changes would not affect sensitive viewers. Vegetation in the VFZ would be cleared and these areas would be revegetated with grasses, but a limited number of sensitive viewers have visual access to these reaches. The overall visual quality in these reaches would not change. Therefore, effects on scenic vistas would be less than significant for these reaches.

In Reaches 2, 4, 16, 20, 22, 31, 33, 35, 37, and 38, vegetation removal in the VFZ and the proposed seepage and stability berms would introduce a large mass into foreground views in place of agricultural orchards now viewed from two residential properties. In Reach 22 the canal would be filled and no longer be present, but it is not immediately visible to sensitive viewers. In Reaches 22 and 38, a portion of the levee would need to be completely reconstructed. These are considerable physical changes to the levee but would result in a minor reduction in the overall visual quality because a limited number of sensitive viewers have visual access to those reaches, as identified in Table 3.13-1 (page 3.13-24~~5~~). Therefore, these effects on scenic vistas are considered less than significant for these reaches.

In Reaches 3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, and 41, the project would have an significant effect on the existing scenic vistas because views from nearby rural roadways, as seen by residents, recreational users, and roadway users, would be substantially altered by the removal of agricultural land and structures and the introduction of expansive seepage and stability berms void of all vegetation other than grasses. Views would be interrupted by these new landforms instead of being multi-directional views of the surrounding landscape. Relatively flat land would be elevated and angled as a result of the seepage and stability berms. This would introduce a large mass into foreground views in place of agricultural orchards or urban development as viewed from sensitive viewer groups. Levee vegetation, row crops, and orchards would be replaced with native grasses associated with erosion control. Seepage and stability berms in Reaches 11 and 18 would result in the loss of residences and businesses, realignment of existing roadways, and removal of vegetation in the VFZ that would visually alter the character and adversely affect the scenic vistas. However, Environmental Commitment 2.4.9.1 *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage and stability berms and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches. The magnitude of the loss of agricultural land, vegetation to be cleared from the VFZ, and introduction of new berms, combined with the loss of structures would have a substantial effect on the visual character and result in a substantial reduction in the overall visual quality, including scenic vistas. Therefore, these effects are considered significant and unavoidable with no mitigation available due to the nature of the effects.

Relocation of PG&E electric transmission and distribution lines would only shift an existing visual element within the landscape, would not introduce new or unfamiliar visual elements. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from vegetation removal would not result in significant effects on scenic vistas. Therefore, effects would be less than significant.

While final soil borrow sites have not been selected, it is unlikely that scenic vistas would be significantly affected because the activity would take place below the surrounding land surface and therefore would not obstruct views; and because borrow sites would be restored to pre-borrow or similar land use, as identified in Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan*. For Alternative 2 soil borrow needs would be greater e than Alternatives 1 and 3 and would potentially involve more sites, greater volumes per site, and greater duration of activities per site.

Ongoing maintenance would be similar to existing levee maintenance and would not result in significant effects.

Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings

As discussed under Effects VIS-1 and VIS-2, Alternative 2 would introduce seepage and stability berms into the viewshed of all viewer groups. Similar to Alternative 1, all vegetation would be removed in the VFZ to the extent necessary within the direct construction footprint. While vegetation beyond the VFZ would be allowed to remain, the lack of woody vegetation would heighten the visibility of the stability and seepage berms. Alternative 2 proposes cutoff walls and seepage and stability berms in the urban reaches, while Alternative 1 proposes only cutoff walls. Accordingly, Alternative 2 would result in the most substantial change in visual character and reduction in visual quality compared to Alternatives 1 and 3. Environmental Commitment 2.4.9.1 *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage berms and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches.

In Reaches 6, 12, 14, 25, 29, and 39, all project features would be located underground and would not be visible to the public. Therefore, effects on the existing visual character and quality of the site would be less than significant for these reaches.

In Reaches 13,17, 24, 26–28, and 34, the cutoff wall would be contained within the levee's existing footprint. In Reaches 24 and 26–28, the canal would be filled and no longer be present, but it is not immediately visible to sensitive viewers. The cutoff wall and reconstructed slopes would not result in a noticeable change in the appearance of the levee, and these changes would not affect sensitive viewers. Vegetation in the VFZ would be cleared and these areas would be revegetated with grasses, but a limited number of sensitive viewers have visual access to these reaches. The overall visual quality in these reaches would not change. Therefore, effects on the existing visual character and quality would be less than significant for these reaches.

In Reaches 2, 4, 16, 20, 22, 31, 33, 35, 37, and 38, vegetation removal in the VFZ and the proposed seepage and stability berms would introduce a large mass into foreground views in place of agricultural orchards now viewed from two residential properties. In Reaches 22 and 38, a portion of the levee would need to be completely reconstructed. These changes would be substantial because of the type of physical changes being made to the levee but would result in a minor

reduction in the overall visual quality because a limited number of sensitive viewers have visual access to those reaches, as identified in Table 3.13-1 (page 3.13-245). Therefore, effects on the existing visual character and quality would be less than significant for these reaches.

In Reaches 3, 5, 7–11, 18, 19, 21, 23, 30, 36, 40, and 41, the project would have an significant effect on the existing visual character and degrade the overall visual quality of the project area because views from nearby rural roadways, as seen by residents, recreational users, and roadway users would be substantially altered by the removal of agricultural land and structures and the introduction of expansive seepage and stability berms void of all vegetation other than grasses. Views would be interrupted by these new landforms instead of being multi-directional views of the surrounding landscape. Relatively flat land would be elevated and angled as a result of the seepage and stability berms. This would introduce a large mass into foreground views in place of agricultural orchards or urban development as viewed from sensitive viewer groups. Levee vegetation, row crops, and orchards would be replaced with native grasses associated with erosion control. Seepage and stability berms would be introduced in Reaches 11 and 18 that would result in the loss of residences and businesses, realignment of existing roadways, and removal of vegetation in the VFZ that would visually alter and adversely affect the existing visual character. The magnitude of the loss of agricultural land, vegetation to be cleared from the VFZ, and introduction of new berms coupled with the loss of structures would have a substantial effect on the visual character and result in a substantial reduction in the overall visual quality. Accordingly, these effects are considered significant and unavoidable with no mitigation available due to the nature of the effects.

Relocation of PG&E electric transmission and distribution lines would only shift an existing visual element within the landscape, would not introduce new or unfamiliar visual elements. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from vegetation removal would not result in significant effects on the existing visual character and quality. Therefore, effects would be less than significant.

While final soil borrow sites have not been selected, it is unlikely that scenic character and quality would be substantially degraded because borrow sites would be restored to pre-borrow or similar land use, as identified in Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan.* Such reclamation would restore existing visual character and quality, considering soil borrow needs are greater for this alternative than Alternatives 1 and 3 and would potentially involve more sites, greater volumes per site, and greater duration of activities per site.

Ongoing maintenance would be similar to existing levee maintenance and would not result in significant effects.

Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day or Nighttime Public Views

The project would not introduce any permanent sources of illumination or reflective surfaces and therefore would result in no change in nighttime light or daytime glare.

3.13.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on visual resources. These potential effects and related mitigation measure requirements are summarized in Table 3.13-5 and discussed below.

Table 3.13-5. Visual Resources Effects and Mitigation Measures for Alternative 3

Effect	Reach	Finding	Mitigation Measure	With Mitigation
Effect VIS-1: Result in Temporary Visual Effects from Construction	All reaches	Less than significant	None required	Less than significant
Effect VIS-2: Adversely Affect a Scenic Vista	All reaches	Less than significant	None required	Less than significant
Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings	All reaches	Less than significant	None required	Less than significant
Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day and Nighttime Public Views	All reaches	Less than significant	None required	Less than significant

Effect VIS-1: Result in Temporary Visual Effects from Construction

Under Alternative 3, this effect is similar to that under Alternative 1, with the most substantial difference being that there would be more seepage berms, but considerably fewer than in Alternative 2. Visual changes resulting from construction are considered short-term and temporary. Equipment would work in one area for a short period of time (typically a matter of days or less for any individual property and receptor group) and then move to a new location along the alignment, and each reach would typically include work only for a single construction season. Therefore, temporary visual effects during construction of Alternative 3 would be considered less than significant.

Effect VIS-2: Adversely Affect a Scenic Vista

As described under Alternatives 1 and 2, the project area is filled with scenic vistas that offer unique views of the contrasting landscape features.

In Reaches 11, 13, 14, 17–21, 24, 26–28, 32, 34, and 36, the cutoff wall would be contained within the levee's existing footprint. In Reaches 26–28, the landside slope of the levee would need to be reconstructed and the canal portion would be armored. The cutoff wall and reconstructed slopes would not result in a noticeable change in the appearance of the levee, and these changes would not affect sensitive viewers. Vegetation in the VFZ would be cleared and these areas would be revegetated with grasses, but a limited number of sensitive viewers have visual access to these reaches. The overall visual quality in these reaches would not change. Therefore, effects on scenic vistas would be less than significant for these reaches.

In Reaches 6, 12, 14, 25, 29, and 39, all project features would be located underground and would not be visible to the public. Therefore, effects on scenic vistas would be less than significant for these reaches.

In Reaches 2–5, 7–10, 16, 22, 23, 30, 31, 33, 35, 37, 38, 40, and 41, vistas would be adversely affected by displaced agricultural fields, the footprint of the seepage berms, and the landside utility and operation and maintenance corridor. Views would be interrupted by the seepage berm landforms instead of being multi-directional views of the surrounding landscape. As with all alternatives, the cutoff walls, which would be contained within the levee's existing footprint, would have no

significant effect on a scenic vista. As under Alternatives 1 and 2, the removal of woody vegetation in the VFZ would be limited to that within the construction footprint.

Construction of seepage berms in the rural reaches would result in the loss of agricultural land. The proposed seepage berm in Reach 5 would be close to two residences (one at O'Connor Avenue and the other at the end of Ashford Avenue) and would be in the middleground of their views. Seepage berms that would be constructed in Reach 33 would result in the loss of vegetation but no residences. Two seepage berms would be installed in Reach 35 and would result in the loss of agricultural land (orchards). Furthermore, the seepage berms in Reach 35 have the potential to visually affect an existing business because of the proximity of these improvements. In Reaches 22 and 30, a portion of the levee would need to be completely reconstructed. The levee also would be strengthened in these reaches by constructing cutoff walls, which would have no visual effect once construction is complete.

These changes would be considerable because of the type of physical changes being made to the levee but would result in a minor reduction in the overall visual quality because a limited number of sensitive viewers have visual access to those reaches, as identified in Table 3.13-1 (page 3.13-245). However, Environmental Commitment 2.4.9.1 ~~2.4.1.5~~ *Use of Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage berms and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches. Accordingly, effects on scenic vistas would be less than significant for these reaches.

Relocation of PG&E electric transmission and distribution lines would only shift an existing visual element within the landscape, would not introduce new or unfamiliar visual elements. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from vegetation removal would not result in significant effects on scenic vistas. Therefore, effects would be less than significant.

While final soil borrow sites have not been selected, it is unlikely that scenic vistas would be affected because the activity would take place below the surrounding land surface and would not obstruct views; and because borrow sites would be restored to pre-borrow or similar land use, as identified in Environmental Commitment 2.4.10 *Soil Borrow Site Reclamation Plan*. For Alternative 2, soil borrow needs are greater than Alternative 1 but less than Alternative 3.

Ongoing maintenance would be similar to existing levee maintenance and would not result in significant effects.

Effect VIS-3: Substantially Degrade the Existing Visual Character or Quality of the Site and Its Surroundings

As discussed under Effect VIS-1 and VIS-2, a cutoff wall within the existing levee footprint would not alter or degrade the existing visual character or quality of the site and its surroundings.

In Reaches 6, 12, 14, 25, 29, and 39, all project features would be located underground and would not be visible to the public. Therefore, effects on the existing visual character and quality of the site would be less than significant for these reaches.

In Reaches 11, 13, 17–21, 24, 26–28, 32, 34, and 36, the cutoff wall would be contained within the levee's existing footprint. In Reaches 26–28, the landside slope of the levee would need to be reconstructed, and the canal portion would be armored. The cutoff wall and reconstructed slopes

would not result in a noticeable change in the appearance of the levee, and these changes would not affect sensitive viewers. Vegetation in the VFZ would be cleared, and these areas would be revegetated with grasses, but a limited number of sensitive viewers have visual access to these reaches. The overall visual quality in these reaches would not change. Therefore, effects would be less than significant for these reaches.

In Reaches 2–5, 7–10, 16, 22, 23, 30, 31, 33, 35, 37, 38, 40, and 41, existing visual character or quality of the site and its surroundings would be adversely affected by displaced agricultural fields, the footprint of the seepage berms, and the landside utility and operation and maintenance corridor. Views would be interrupted by the seepage berm landforms instead of being multi-directional views of the surrounding landscape. ~~As with all alternatives, the cutoff walls, which would be contained within the levee's existing footprint, would have no significant effect on the existing visual character and quality of the site.~~

Construction of seepage berms in the rural reaches would result in the loss of agricultural land. The proposed seepage berm located in Reach 5 would be close to two residences (one at O'Connor Avenue and the other at the end of Ashford Avenue) and would be in the middleground of their views. Seepage berms ~~would be constructed~~ in Reach<u>es</u> 33<u>, 37, 38, and 40</u>~~. These new seepage berms~~ would result in the loss of vegetation but no residences. Two seepage berms would be installed in Reach 35 and would result in the loss of agricultural land (orchards). Furthermore, the seepage berms in Reach 35 have the potential to visually affect an existing business because of the proximity of these improvements. In Reaches 22 and 30, a portion of the levee would need to be completely reconstructed. The levee also would be strengthened in these reaches by constructing cutoff walls, which would have no visual effect once construction is complete. These changes would be considerable because of the type of physical changes being made to the levee but would result in a minor reduction in the overall visual quality because a limited number of sensitive viewers have visual access to those reaches, as identified in Table 3.13-1 (page 3.13-2~~4~~5). However, Environmental Commitment 2.4.9.1 *Use Native Wildflower Species in Erosion Control Grassland Seed Mix*, would improve the aesthetics of the seepage berms and other surfaces treated with erosion control measures by providing seasonal interest through wildflower displays in all reaches. Accordingly, effects would be less than significant for these reaches.

<u>Relocation of PG&E electric transmission and distribution lines would only shift an existing visual element within the landscape, would not introduce new or unfamiliar visual elements. Environmental Commitment 2.4.9.2 *Replant Trees and Shrubs along PG&E Utility Line Relocations, in Conformance with Utility Line Vegetation Clearance Zones* would ensure that visual effects resulting from vegetation removal would not result in significant effects on the existing visual character and quality. Therefore, effects would be less than significant.</u>

While final soil borrow sites have not been selected, it is unlikely that scenic character and quality would be substantially degraded because borrow sites would be restored to pre-borrow or similar land use, as identified in Environmental Commitment 2.4.10 *Develop a Soil Borrow Site Reclamation Plan,* essentially retaining existing character and quality, considering soil borrow needs are greater for this alternative than Alternative 1 but less than for Alternative 2.

Ongoing maintenance would be similar to existing levee maintenance and would not result in significant effects.

Effect VIS-4: Create a New Source of Substantial Light or Glare That Would Adversely Affect Day or Nighttime Public Views

The project would not introduce any permanent sources of illumination or reflective surfaces and therefore would result in no change in nighttime light or daytime glare.

Table 3.13-1. Visual Quality Rating Summary

Reach	Alternative	Vividness	Intactness	Unity	Visual Quality	Change	Viewers
Reach 1	This Reach is not included within the project.					–	
Reach 2	Existing	3.5	4	4	3.8	–	Roadway users traveling along Laurel Ave. Residents. Recreational users at Bobelaine Audubon Sanctuary.
	Alt 1	3.5	4	4	3.8	0.0	
	Alt 2	3	3.5	3.5	3.3	0.5	
	Alt 3	3	3.5	3.5	3.3	0.5	
Reach 3	Existing	3.5	4	4	3.8	–	Roadway users traveling along Oak Ave. and Cypress Ave. Residents. Recreational users at Bobelaine Audubon Sanctuary and Feather River Wildlife Area.
	Alt 1	3.25	3.75	3.75	3.6	0.3	
	Alt 2	2.25	3.75	2.75	2.9	0.9	
	Alt 3	3.25	3.75	3.75	3.6	0.3	
Reach 4	Existing	3.5	4	4	3.8	–	Roadway users traveling along Central Street and Wilkie Ave. Residents. Recreational users at Feather River Wildlife Area.
	Alt 1	3.5	4	4	3.8	0.0	
	Alt 2	3	3.5	3.5	3.3	0.5	
	Alt 3	3	4	4	3.7	0.2	
Reach 5	Existing	3.5	4	4	3.8	–	Roadway users traveling along Wilkie Ave., Lyon Ave., Oconnor Ave., Peck Ave., and Ashford Ave. Residents. Recreational users at Feather River Wildlife Area.
	Alt 1	3.5	3.5	3.5	3.5	0.3	
	Alt 2	3	3	3	3.0	0.8	
	Alt 3	3.5	3.5	3.5	3.5	0.3	
Reach 6	Existing	3.5	4	4	3.8	–	Roadway users traveling along Star Bend Rd., Shannon Rd., and Garden Hwy. Residents. Recreational users at Feather River Wildlife Area.
	Alt 1	3.5	4	4	3.8	0	
	Alt 2	3.5	4	4	3.8	0	
	Alt 3	3.5	4	4	3.8	0	
Reach 7	Existing	3.5	4	4	3.8	–	Roadway users traveling along Star Bend Rd. and Garden Hwy. Residents. Recreational users at Feather River Wildlife Area.
	Alt 1	3.25	3.75	3.75	3.6	0.3	
	Alt 2	2.75	2.75	2.75	2.8	1.1	
	Alt 3	3.25	3.75	3.75	3.6	0.3	
Reach 8	Existing	3.5	4	4	3.8	–	Roadway users traveling along Garden Hwy. Business. Recreational users at Feather River Wildlife Area.
	Alt 1	3.25	3.75	3.75	3.6	0.3	
	Alt 2	2.75	3.25	3.25	3.1	0.8	
	Alt 3	3.25	3.75	3.75	3.6	0.3	
Reach 9	Existing	3.5	4	4	3.8	–	Roadway users traveling along Garden Hwy. Residents. Businesses. Recreational users at Boyd's Pump Boat Ramp.
	Alt 1	3.25	3.75	3.75	3.6	0.3	
	Alt 2	2.75	3.25	3.25	3.1	0.8	
	Alt 3	3.25	3.75	3.75	3.6	0.3	
Reach 10	Existing	3.5	4	4	3.8	–	Roadway users traveling along Garden Hwy., Oswald Rd., and Barry Rd. Residents.
	Alt 1	3.25	3.75	3.75	3.6	0.3	
	Alt 2	2.75	2.75	2.75	2.8	1.1	
	Alt 3	3.25	3.75	3.75	3.6	0.3	
Reach 11	Existing	3.5	4	4	3.8	–	Roadway users traveling along Garden Hwy. Residents. Recreational
	Alt 1	3.5	4	4	3.8	0.0	

Reach	Alternative	Vividness	Intactness	Unity	Visual Quality	Change	Viewers
	Alt 2	2.5	2.5	2.5	2.5	1.3	users at Feather River Wildlife Area.
	Alt 3	3.5	4	4	3.8	0.0	
Reach 12	Existing	2.5	3.5	3.5	3.2	–	Roadway users traveling along Shanghai Bend Rd., Montana Ct., and Dakota Ct. Residents. Recreational users at Feather River Wildlife Area.
	Alt 1	2.5	3.5	3.5	3.2	0.0	
	Alt 2	2.5	3.5	3.5	3.2	0.0	
	Alt 3	2.5	3.5	3.5	3.2	0.0	
Reach 13	Existing	2.5	3.5	3.5	3.2	–	Residents. Recreational users at Yuba Sutter Dog Park and Feather River Wildlife Area . Businesses. Airport users.
	Alt 1	2.5	3.5	3.5	3.2	0.0	
	Alt 2	2.5	3.5	3.5	3.2	0.0	
	Alt 3	2.5	3.5	3.5	3.2	0.0	
Reach 14	Existing	2.5	3.5	3.5	3.2	–	Roadway users traveling along 2nd St. Airport users. Residents. Businesses. Recreational users at Yuba City Boat Ramp.
	Alt 1	2.5	3.5	3.5	3.2	0.0	
	Alt 2	2.5	3.5	3.5	3.2	0.0	
	Alt 3	2.5	3.5	3.5	3.2	0.0	
Reach 15	Existing	2.5	3.5	3.5	3.2	–	Roadway users traveling along 2nd St. Airport users. Recreational users at Yuba City Boat Ramp and Peach Bowl Little League Field.
	Alt 1	2.5	3.5	3.5	3.2	0.0	
	Alt 2	2.5	3.5	3.5	3.2	0.0	
	Alt 3	2.5	3.5	3.5	3.2	0.0	
Reach 16	Existing	2.5	3.5	3.5	3.2	–	Roadway users traveling along 2nd St. Airport users. Residents. Businesses. Recreational users at Yuba City Boat Ramp.
	Alt 1	2.25	3.25	3.25	2.9	0.3	
	Alt 2	2.25	3.25	3.25	2.9	0.3	
	Alt 3	2.25	3.25	3.25	2.9	0.3	
Reach 17	Existing	2.5	3.5	3.5	3.2	–	Roadway users traveling along Live Oak Blvd. Businesses.
	Alt 1	2.5	3.5	3.5	3.2	0.0	
	Alt 2	2.5	3.5	3.5	3.2	0.0	
	Alt 3	2.5	3.5	3.5	3.2	0.0	
Reach 18	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Live Oak Blvd., Rednall Rd., and Levee Rd. Residents.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	3	3	3	3.0	1.3	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 19	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Live Oak Blvd., Levee Rd., and Morse Rd. Residents. Businesses. Recreational users at Feather River Wildlife Area.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	3	3	3	3.0	1.3	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 20	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Koch Lane. Residents. Recreational users at Feather River Wildlife Area.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	3.5	4	4	3.8	0.5	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 21	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Hermanson St., Bridgeford Ave., and Kent Ave. Residents.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	3	3	3	3.0	1.3	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 22	Existing	4	4.5	4.5	4.3	–	Roadway uses traveling along Paseo Ave. and Bishop Ave. Residents.
	Alt 1	3.75	4.25	4.25	4.1	0.3	
	Alt 2	3.75	4.25	4.25	4.1	0.3	
	Alt 3	3.75	4.25	4.25	4.1	0.3	

Reach	Alternative	Vividness	Intactness	Unity	Visual Quality	Change	Viewers
Reach 23	Existing	4	4.5	4.5	4.3	–	Roadway uses traveling along Archer Ave., Pennington Ave., and Gooley Rd. Residents. Recreational users at Live Oak Riverfront Park Boat Launch Facility.
	Alt 1	3.75	4.25	4.25	4.1	0.3	
	Alt 2	3.25	3.75	3.75	3.6	0.8	
	Alt 3	3.75	4.25	4.25	4.1	0.3	
Reach 24	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Campbell Rd. Resident.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	4	4.5	4.5	4.3	0.0	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 25	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Rivera Rd., Levee Rd., and Metteer Rd. Residents.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	4	4.5	4.5	4.3	0.0	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 26	Existing	4	4.5	4.5	4.3	–	Roadway uses traveling along Levee Rd. and Chandon Ave. Residents.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	4	4.5	4.5	4.3	0.0	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 27	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Levee Rd.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	4	4.5	4.5	4.3	0.0	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 28	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Levee Rd., Campbell Rd., and E. Evans Reimer Rd. Residents.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	4	4.5	4.5	4.3	0.0	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 29	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Levee Rd., E. Evans Reimer Rd., and Alexander Ave. Residents.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	4	4.5	4.5	4.3	0.0	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 30	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Richards Ave., Briarcliff Ln., Booth Dr., and E. Gridley Rd. Residents. Recreational users at City of Gridley Boat Ramp.
	Alt 1	3.75	4.25	4.25	4.1	0.3	
	Alt 2	2.75	2.75	2.75	2.8	1.6	
	Alt 3	3.75	4.25	4.25	4.1	0.3	
Reach 31	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along E. Gridley Rd. and Ord Ranch Rd.
	Alt 1	3.75	4.25	4.25	4.1	0.3	
	Alt 2	3.75	4.25	4.25	4.1	0.3	
	Alt 3	3.75	4.25	4.25	4.1	0.3	
Reach 32	Existing	4	4.5	4.5	4.3	–	Roadway users traveling along Ord Ranch Rd.
	Alt 1	4	4.5	4.5	4.3	0.0	
	Alt 2	3.5	4	4	3.8	0.5	
	Alt 3	4	4.5	4.5	4.3	0.0	
Reach 33	Existing	3.5	3.5	3.5	3.5	–	Roadway users traveling along Ord Ranch Rd., Steadman Rd., and Almond Ave. Residents. Recreational users within Oroville WMA.
	Alt 1	3.5	3.5	3.5	3.5	0.0	
	Alt 2	3	3	3	3.0	0.5	
	Alt 3	3	3	3	3.0	0.5	
Reach 34	Existing	3.5	3.5	3.5	3.5	–	Roadway users traveling along Ord Ranch Rd., Palm Ave., Hixson Ave.,
	Alt 1	3.5	3.5	3.5	3.5	0.0	

Reach	Alternative	Vividness	Intactness	Unity	Visual Quality	Change	Viewers
	Alt 2	3.5	3.5	3.5	3.5	0.0	and Cherry Ave. Business. Recreational users within Oro Oroville WMA.
	Alt 3	3.5	3.5	3.5	3.5	0.0	
Reach 35	Existing	4	4	4	4.0	–	Roadway users traveling along Hixson Ave., Cherry Ave., and Walnut Ave. Business. Recreational users within Oroville WMA.
	Alt 1	4	4	4	4.0	0.0	
	Alt 2	3.5	3.5	3.5	3.5	0.5	
	Alt 3	3.5	3.5	3.5	3.5	0.5	
Reach 36	Existing	4	4	4	4.0	–	Roadway users traveling along Hixson Ave. and Larkin Rd. Resident. Business. Recreational users within Oroville WMA.
	Alt 1	4	4	4	4.0	0.0	
	Alt 2	3	3	3	3.0	1.0	
	Alt 3	4	4	4	4.0	0.0	
Reach 37	Existing	3.5	3.5	3.5	3.5	–	Roadway users traveling along Hixson Ave. and Vance Ave. Resident. Business. Recreational users within Oroville WMA.
	Alt 1	3.5	3.5	3.5	3.5	0.0	
	Alt 2	3	3	3	3.0	0.5	
	Alt 3	3	3	3	3.0	0.5	
Reach 38	Existing	3.5	3.5	3.5	3.5	–	Roadway users traveling along Vance Ave. Resident. Recreational users within Oroville WMA.
	Alt 1	3.5	3.5	3.5	3.5	0.0	
	Alt 2	3	3	3	3.0	0.5	
	Alt 3	3	3	3	3.0	0.5	
Reach 39	Existing	3.5	3.5	3.5	3.5	–	Roadway users traveling along Vance Ave. Resident. Recreational users within Oroville WMA.
	Alt 1	3.5	3.5	3.5	3.5	0.0	
	Alt 2	3.5	3.5	3.5	3.5	0.0	
	Alt 3	3.5	3.5	3.5	3.5	0.0	
Reach 40	Existing	3.5	4	4	3.8	–	Roadway users traveling along Vance Ave. and Larkin Rd. Recreational users within Oroville WMA.
	Alt 1	3.25	3.75	3.75	3.6	0.3	
	Alt 2	2.25	2.75	2.75	2.6	1.3	
	Alt 3	3	3.5	3.5	3.3	0.5	
Reach 41	Existing	4	4	4	4.0	–	Roadway users traveling along Vance Rd. and Larking Rd. Recreational users within Oroville WMA.
	Alt 1	3.75	3.75	3.75	3.8	0.3	
	Alt 2	2.75	2.75	2.75	2.8	1.3	
	Alt 3	3.75	3.75	3.75	3.8	0.3	

WMA = Wildlife Management Area.

Ratings:
- Very Low = 0–1.49
- Low = 1.5–2.49
- Moderately Low = 2.5–3.49
- Moderate = 3.5–4.49
- Moderately High = 4.5–5.49
- High = 5.5–6.49
- Very High = 6.5–7

3.14 Recreation

3.14.1 Introduction

This section describes the regulatory and environmental setting for recreation; effects on recreation that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects.

3.14.2 Affected Environment

This section describes the affected environment for recreation in the project area. The key sources of data and information used in the preparation of this section are as follows.

- State Panel to Review Yuba City's Willow Island Project (Appeal Democrat 2010).
- Butte County 2007 Future Bike Routes within Butte County (Butte County 2007).
- Butte County Countywide Bikeway Master Plan (Butte County 1998).
- Butte County General Plan 2030 (Butte County 2010).
- Feather River Wildlife Area (California Department of Fish and Game 2012a).
- Oroville Wildlife Area (California Department of Fish and Game 2012b).
- California Department of Fish and Game Feather River Wildlife Area Management Plan (California Department of Fish and Game 1991).
- California Department of Fish and Game Oroville Wildlife Area Management Plan (California Department of Fish and Game 1974).
- California Department of Transportation Highway Design Manual (California Department of Transportation 2006).
- California State Parks Central Valley Vision (California State Parks 2006).
- California State Parks Central Valley Vision Draft Implementation Plan (California State Parks 2008).
- City of Gridley Bicycle Plan (City of Gridley 2003).
- City of Gridley 2030 General Plan (City of Gridley 2010).
- City of Live Oak Draft General Plan, Parks and Recreation Element (City of Live Oak 2010).
- City of Yuba City Feather River Parkway Strategic Plan (City of Yuba City 2002).
- City of Yuba City General Plan (City of Yuba City 2004).
- Feather River Air Quality Management District Yuba-Sutter Bikeway Master Plan (Feather River Air Quality Management District 1995).
- GreenInfo Network (California's Protected Areas Database 2012).
- Sacramento Audubon Society Bobelaine Audubon Sanctuary (Sacramento Audubon Society 2012).

- Sutter County General Plan, Recreation (Sutter County 1996).
- Sutter County General Plan (Sutter County 2011).
- U.S. Army Corps of Engineers Recreation Facility and Customer Service Standards, EM 1110-1-400 (U.S. Army Corps of Engineers 2005).
- U.S. Bureau of Reclamation Recreation Facility Design Guidelines (U.S. Bureau of Reclamation 2002).
- Campgrounds, Marinas, and Recreation Vehicles (City of Yuba City 2012).
- Off the Leash Dog Park – Yuba Sutter Dog Park (Yuba Sutter Dog Park 2012).

Throughout this section, bike trails are referred to as Class I, II, or III. These trail classifications are Caltrans design standard designations (California Department of Transportation 2006: 1000-1-1000-2). Class I bike paths provide completely separated facilities designed for the exclusive use of bicycles and pedestrians with minimal crossflows by motorists. Caltrans standards call for Class I bikeways to have a minimum of 8 feet of pavement with 2-foot graded shoulders on either side, for a total right-of-way of 12 feet. Class I bikeways also must be at least 5 feet from the edge of a paved roadway. Class II trails provide a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and crossflows by pedestrians and motorists permitted. Caltrans standards generally require a 4-foot bike lane with a 6-inch white stripe separating the roadway from the bike lane. Class III trails provide a right-of-way designated by signs or permanent markings and shared with pedestrians and motorists. Roadways designated as Class III bike routes should have sufficient width to accommodate motorists, bicyclists, and pedestrians. Other than a street sign, there are no special markings required for a Class III bike route.

3.14.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to recreation. Additional regulatory information appears in Appendix A.

Federal

Federal policies or regulations related to recreation resources include the 2004 Engineering Manual 1110-1-400 (EM) prepared by USACE and the Recreation Facility Design Guidelines (RFDG) prepared by U.S. Department of the Interior (DOI). These regulations apply to the development of, improvements to, and ongoing maintenance of new and existing recreation facilities and resources in the planning area. Federal plans prepared by USACE and DOI could affect the development of recreation facilities and resources in the planning area.

Constitution of the United States

The Commerce Clause of the U.S. Constitution conveys on the Federal government "the control for that purpose, and to the extent necessary, of all the navigable waters of the United States…This power to regulate navigation confers upon the United States a dominant servitude, which extends to the entire stream and the stream bed below ordinary high-water mark." *U.S. v. Rands*, 389 U.S. 121 (1967).

U.S. Army Corps of Engineers

USACE prepared Engineering Manual 1110-1-400 to achieve a nationwide standard for park and recreation facilities managed by USACE. The manual provides guiding principles for ensuring consideration of the design, use, accessibility, sustainability, and cost of facilities; the health, safety, recreation needs, and welfare of the intended users; and the long-term harmony of the facility with the environment and maintenance requirements. The manual was updated most recently in 2004.

State

The following state policies related to recreation may apply to implementation of the proposed project.

Constitution of the State of California

The California law principle of a public right to access navigable waterways runs parallel to the Federal concept of a navigable servitude, described above. Article X, Section 4 of the California Constitution guarantees members of the public a right of access to the navigable waters of the state, which are held in trust for the benefit of the people:

> No individual, partnership, or corporation, claiming or possessing the frontage of tidal land of a harbor, bay, inlet, estuary, or other navigable water in this State, shall be permitted to exclude the right of way to such water whenever it is required for any public purpose, nor to destroy or obstruct the free navigation of such water; and the Legislature shall enact such laws as will give the most liberal construction to this provision, so that access to navigable waters of this State shall always be attainable for the people thereof.

This right is also reiterated in statute, see, e.g. Gov. Code, § 39933. This right is inherent in the public trust under which the navigable waters are held (see *Marks v. Whitney* [1971] 6 Cal.3d 251; 79 Ops.Cal.Atty.Gen. 133, 135-146 [1996]). The interest of the public in the waters and bed of a navigable river is analogous to that of the public in a public road. See, e.g., *People ex rel. Younger v. County of El Dorado*, 96 Cal. App. 3d 403, 157 Cal. Rptr. 815 (3d Dist. 1979).

Although the state may not "divest the people of the State of their rights in navigable waters of the state," the public's right to access navigable waterways is not absolute. For example, the public has no right to trespass and cross private lands in order to reach navigable waters to hunt or fish. *Bohn v. Albertson*, 107 Cal. App. 2d 738, 238 P.2d 128 (1st Dist. 1951). The state's authority to control and regulate usage of its navigable waterways is absolute when it is acting within the terms of the public trust. For example, an agency may restrict the public's access rights in a specific instance if the purpose of the restriction is to promote the overall use of navigable waters. (*City of Berkeley v. Superior Court*, supra, 26 Cal.3d at 523-526), and when there are competing trust uses, the state may prefer one use over another. (*Carstens v. California Coastal Com.* (1986) 182 Cal.App.3d 277, 289 (holding that the law did not preclude an agency from considering "commerce as well as recreational and environmental needs" in mediating access disputes).

Feather River Wildlife Area Management Plan

In the Feather River Wildlife Area Management Plan, CDFW identifies preservation and enhancement of habitat, recreation, and education as the three purposes for acquisition of property (California Department of Fish and Game 1991:1). The document describes the expansion of, improvements to, and ongoing maintenance of the wildlife area (California Department of Fish and

Game 1991:9). Two goals are defined in the document relating to recreation. These goals are as follows.

> **Goal 4)** Provide for public use of the area. Appropriate uses of the area are hunting, fishing, trapping, birdwatching, hiking, nature study, picnicking, and boating.
>
> **Goal 5)** Provide for public education facilities concerning the value of habitat and wildlife. This may include the construction of buildings, signs, trails, etc., which increases the public's appreciation for the area. An adequate road and trail system now exists on the area and new construction should be held to a minimum.

Oroville Wildlife Area Management Plan

The document describes the purpose, current uses, potential uses, and long range plan for the Oroville Wildlife Area. The primary purpose of the wildlife area is to preserve and enhance the fish and wildlife resources for use and enjoyment by the public (California Department of Fish and Game 1974:1).

Local

Butte County, Sutter County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley each have adopted policies and goals promoting recreation via trail, bikeway, open space, and park facilities, detailed in Appendix A.

3.14.2.2 Environmental Setting

The following considerations are relevant to recreation conditions in the proposed project area. The FRWLP has been divided into 41 reaches. ~~Of these, the FRWLP identifies flood management measures for 34 reaches.~~ Recreation facilities and resources are located in, or adjacent to, 22 of the project reaches with project alternatives identified.

The Feather River and its adjacent levees are a popular recreation venue for local residents and visitors. While recreation opportunities vary among locations along the river, recreationists are attracted to water-based recreation as well as land-based recreation on the levees and facilities surrounding the river. Water-based recreation activities include boating, fishing, kayaking, canoeing, floating, tubing, water skiing, and swimming. Land-based activities include bicycling, walking, hiking, hunting, bird-watching, wildlife viewing, enjoying nature trails, photography, picnicking, and more. Access to the right (west) bank of the Feather River is provided by state wildlife areas, local parks, and a wildlife sanctuary. Many parts of the shoreline, especially north of Yuba City, are inaccessible to recreationists.

Boating is a common activity along the Feather River. Motorized boat use—water skiing, use of personal watercraft, and cruising along the river—is especially popular in various locations. Kayaking and canoeing is occasionally favored in portions of the river. Boat ramps are distributed approximately every 7 miles along the Feather River between Thermalito Afterbay and the Sutter Bypass.

Fishing is another popular recreation activity throughout portions of the corridor. Anglers fish from boats and the shore throughout the reaches of the river.

Yuba City is the only community immediately adjacent to the right (west) bank of the Feather River within the corridor. Three other communities are within 3 miles of the levee: Biggs, Gridley, and Live

Oak. All four communities have policies or plans involving recreation interfacing with the Feather River levee and have recreation resources which could be affected by modifications to the Feather River levee.

Formal Recreation Facilities

Recreation facilities and resources in, adjacent to, or within view of the project area are described below from north to south. See Plate 3.14-1 for locations of these recreation facilities and resources.

Oroville Wildlife Area

The OWA is managed by the California Department of Fish and Game. The OWA is 11,869 acres in size and is primarily riparian woodland along the Feather River and Thermalito Afterbay (California Department of Fish and Game 2012b). Hunting, fishing, swimming, picnicking, hiking, horseback riding, birding, biking, boating, camping and other activities are allowed in the OWA (California Department of Fish and Game 1974:2). In addition to these activities, dog training is allowed from July 1 through March 15 in designated areas, and there is an onsite shooting range (California Department of Fish and Game 2012b). The OWA is accessible by vehicle travel, boating, biking, horseback riding, and walking from public roads or trails. There are approximately 10.5 miles of levee on the west side of the Feather River within the OWA. About 5.5 miles of this levee are within the FRWLP. The OWA is located within the FRWLP Reaches 33 through 41.

City of Gridley Boat Ramp

The City of Gridley Boat Ramp is managed by the City of Gridley. The City of Gridley Boat Ramp is located within view of the FRWLP Reach 30 on the east side of the Feather River outside of the project area. The boat ramp is next to the City's water treatment plant and provides opportunities for boating and day use (City of Gridley 2010:18).

Live Oak Park and Recreation Area

The Live Oak Park and Recreation Area is managed by Sutter County. The campground, RV park, and boat ramp at the facility allow for camping and boating in addition to swimming, picnicking, and day use (City of Live Oak 2010:2). The Live Oak Park and Recreation Area is located within the FRWLP Reach 23.

Feather River Wildlife Area

The Feather River Wildlife Area (FRWA) is comprised of eight separate wildlife area management units. Five wildlife area units are located on the west side of the Feather River and are within the project area. These five areas from north to south are: Morse Road Unit, Shanghai Bend Unit, Abbott Lake Unit, O' Connor Lakes Unit, and Nelson Slough Unit. These five unites total 1,724 acres (California's Protected Areas Database 2012). Three units are located on the east side of the Feather River and are visible from and have views to the project area. These three areas from north to south are: Marysville Unit, Star Bend Unit, and Lake of the Woods Unit. Morse Road Unit is a 62-acre management unit located within project Reach 19. Marysville Unit is located across from project Reaches 16 and 17. Shanghai Bend Unit is a 98-acre management unit located within project Reaches 11 through 13. Abbott Lake Unit is a 409-acre management unit located within project Reaches 7 and 8. Star Bend Unit is located across from project Reaches 6 and 7. O'Connor Lake Unit is a 467-acre management unit located within project Reaches 5 and 6. Lake of the Woods Unit is

located across from project Reaches 3 through 5. Nelson Bend Unit is a 688-acre management unit located within project Reach 2 (California's Protected Areas Database 2012).

The FRWA is accessible by vehicular travel, boating, biking, and walking from public roads or trails. Hunting, fishing, trapping, birdwatching, hiking, nature study, picnicking, and boating are allowed in the FRWA (California Department of Fish and Game 1991:2). Hunting is restricted to certain seasons for authorized species. No permits, passes, or reservations are required to use the wildlife area for other allowed uses. There is a Class I Bike Trail on top of the Feather River Levee in the Shanghai Bend Unit and hunting is not allowed in the Shanghai Bend Unit (California Department of Fish and Game 2012a).

Park and Recreation Facilities within Yuba City

There are five park and recreation facilities in Yuba City within the project area. From north to south these are: Feather River Parkway Bike Trail, Willow Island Park, Veterans Park, Yuba City Boat Ramp, Peach Bowl Little League Fields, and Yuba Sutter Dog Park (City of Yuba City 2004:6-4). The recreation facilities within Yuba City are integrated with the urban fabric and are accessible in numerous ways providing places for fishing, swimming, picnicking, walking, biking, wildlife viewing, boating, baseball, and other activities.

Feather River Parkway Bike Trail

Feather River Parkway Bike Trail is 5 miles long between Northgate Drive and Shanghai Bend Road located within the FRWLP Reaches 12 through 17. The trail is heavily used (McIntire pers. comm.). The trail will connect to Yuba City's Class I and Class II bike trail network at Northgate Drive, B Street, and Shanghai Bend Road in the future (Feather River Air Quality Management District 1995: 16).

Willow Island Park

Willow Island Park is 172 acres in size and is located within project Reaches 16 and 17. Construction on the first phase of Willow Island Park is expected to begin in 2012. The first phase of Willow Island Park includes pedestrian and bicycle trails, a picnic area, and a parking lot, with more amenities planned for future phases. Willow Island Park is expected to be a heavily used park once completed (McIntire pers. comm.).

Veterans Park

Veterans Park is a passive use park with a World War I memorial located adjacent to project Reach 16. Veterans Park is managed by Yuba City and has minimal use by the public (McIntire pers. comm.).

Yuba City Boat Ramp

Yuba City Boat Ramp is located within project Reaches 15 and 16 and has RV campsites, barbeques, picnic tables, showers, bathrooms, boat launching facilities, and a small marina (City of Yuba City 2012). Yuba City Boat Ramp is owned and managed by Sutter County and is heavily used by the public (McIntire pers. comm.).

Peach Bowl Little League Field

Peach Bowl Little League Field comprises three baseball diamonds located adjacent to project Reach 15. Peach Bowl Little League Field is managed by Peach Bowl, a nonprofit volunteer little league organization. The ball diamonds are heavily used (McIntire pers. comm.).

Yuba Sutter Dog Park

Yuba Sutter Dog Park is 5 acres in size and has an off-leash area for dogs, benches, drinking water, and shade trees (Yuba Sutter Dog Park 2012). Yuba Sutter Dog Park is located on land owned by Caltrans and is operated by Off the Leash Dog Park, a nonprofit volunteer group. The dog park is heavily used (McIntire pers. comm.). Yuba Sutter Dog Park is adjacent to the FRWLP Reach 13.

Boyd's Pump Boat Ramp

The Boyd's Pump Boat Ramp, just south of Yuba City, is a public boat launching facility on the Feather River managed by Sutter County. The facility has a parking area and boat ramp that provides an opportunity for motorized and nonmotorized boat launching. This facility is located within the FRWLP Reach 9.

Bobelaine Audubon Sanctuary

The Bobelaine Audubon Sanctuary is a 430-acre wildlife sanctuary owned by the National Audubon Society and managed by volunteers of the Sacramento Audubon Society. Bobelaine is a rare remnant of the riparian forests that once projected 2 to 5 miles on either side of the rivers in the Great Central Valley of California. The sanctuary is registered as a "State Ecological Reserve" and is protected by the ~~California Department of Fish and Game~~CDFW and the National Audubon Society. It is also listed as part of an "Important Bird Area" by the National Audubon Society. Hiking, walking, and wildlife viewing are all allowed recreational uses within the preserve (Sacramento Audubon Society 2012). Bobelaine Audubon Sanctuary is located within the FRWLP Reaches 2 and 3.

3.14.3 Environmental Consequences

This section describes the environmental consequences relating to recreation for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.14.3.1 Assessment Methods

This evaluation of recreation is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

Effects on recreation related to the FRWLP were evaluated qualitatively. Generally, construction activities could result in short-term loss of recreation opportunities by disrupting use of recreation areas, resources, or recreational boating corridors. A long-term effect could occur if a recreation opportunity is eliminated or the quality of that opportunity is severely reduced as a result of

permanent project-related structures or operations. Long-term beneficial effects could occur if new or enhanced recreation opportunities are created through implementation of the project.

3.14.3.2 Determination of Effects

For this analysis, an effect pertaining to recreation was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Increase the use of existing neighborhood and regional parks or other recreation facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreation facilities or require the construction or expansion of recreation facilities that might have an adverse physical effect on the environment.
- Restrict or reduce the availability or quality of existing recreation opportunities in the project vicinity.
- Implement operational or construction-related activities related to the placement of project facilities that would cause a substantial long-term disruption of any institutionally recognized recreation activities.
- Result in increased risk to recreationists in or adjacent to the project vicinity.

The proposed alternatives do not include the construction of recreation facilities unless required as a form of mitigation associated with a project alternative.

3.14.4 Effects and Mitigation Measures

There is a substantial variety of type and intensity of recreation occurring at sites along the Feather River within the project area. Effects and mitigation measure requirements concerning recreation are summarized in Table 3.14-1.

Table 3.14-1. Summary of Effects for Recreation

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect REC-1: Temporary Changes in Recreation Opportunities during Construction	Less than significant	None required	Less than significant
Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor	Less than significant	None required	Less than significant

3.14.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies in the Feather River West Levee along the 44 miles south of Thermalito Afterbay. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and flood ~~control~~ risk management regimes relative to existing conditions. This means that the project area levee system would remain or become more susceptible to levee failure. The magnitude of the flood damage and inundation would depend on the location of a levee breach, severity of the storm, and flows of the river at the time of a potential levee failure.

During a 100-year flood event scenario, inundation levels would range from 1 foot to 15 feet and could flood approximately 44,919 acres of open space, golf courses, and parks. A potential flood event of this or similar magnitude could significantly damage existing facilities, infrastructure, and the environment and setting of the various open spaces, parks, and recreation facilities. It is possible that after a flood event, recreation facilities may never be fully restored to their former condition, permanently reducing the quality and/or quantity of recreation opportunities in the area. In addition, scenic vistas for existing and future recreation facilities could be damaged irreparably or for an extended period of time, which would reduce the enjoyment derived by recreationists. Given the uncertainty of the occurrence or magnitude of such an event, potential effects on recreation cannot be quantified based on available information.

3.14.4.2 Alternative 1

Alternative 1 addresses deficiencies in the levee primarily using cutoff walls with seepage berms and slope flattening in select locations, such that increases in the overall footprint of the levee are minimized. Implementation of Alternative 1 would potentially result in effects on recreation. These potential effects and related mitigation measure requirements are summarized in Table 3.14-2 and discussed below.

Table 3.14-2. Recreation Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measures	With Mitigation
Effect REC-1: Temporary Changes in Recreation Opportunities during Construction	Less than significant	None required	Less than significant
Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor	Less than significant	None required	Less than significant

Cutoff walls would be installed in the OWA, Live Oak Park and Recreation Area, FRWA (all five units in the FRWLP area), Feather River Parkway Bike Trail, Willow Island Park, Yuba City Boat Ramp, Peach Bowl Little League Fields, Yuba Sutter Dog Park, Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary. Levee slopes would be flattened on the waterside of the levee next to Feather River Parkway Bike Trail, Willow Island Park, Veteran's Park, and Yuba City Boat Ramp. An undrained seepage berm would be installed at the FRWA O' Connor Lakes Unit.

Construction of Alternative 1 would occur primarily between April 15 and November 30 over the course of more than one construction season (subject to conditions). Construction is planned for the levee adjacent to Live Oak Park and Recreation Area, FRWA (Morse Road and Shanghai Bend Units), Feather River Parkway Bike Trail, Willow Island Park, Veteran's Park, Yuba City Boat Ramp, Peach Bowl Little League Fields, and Yuba Sutter Dog Park in 2013-2014. Construction is planned for the levee adjacent to OWA, Boyd's Pump Boat Ramp, FRWA (Abbott Lake Unit and O'Conner Lakes Unit), and Bobelaine Audubon Sanctuary in 2014–2015.

The FRWLP does not include new recreation facilities or expansion of existing facilities ~~at this time~~. ~~As stated in Chapter 2, *Alternatives*, the Sutter Basin Project feasibility study has been drafted to determine the extent of Federal interest in exploring opportunities to increase recreation as part of the FRWLP to reduce flood risk. Appropriation of funding for increasing recreation facilities, if a project were to be authorized as part of the FRWLP, is highly uncertain.~~

Effect REC-1: Temporary Changes in Recreation Opportunities during Construction

During construction, the levee crown and adjacent construction and staging areas would be closed to public access. Recreationists wishing to use the various parks, wildlife areas, trails, and other recreation facilities would not have access to the recreation facilities or be able to participate in recreation activities when the levee crown and adjacent construction and staging areas are closed to public access. Construction of seepage berms may displace the current access and staging areas to some park and recreation facilities including the O'Connor Lakes Unit of the FRWA.

The effects of construction activity on the river channel, nearby recreation areas on the east bank of the river, or on the landward side of the levee are expected to be minimal. Construction will be confined to the narrow project footprint and proceed in a linear fashion. The disturbance would not affect any particular site for an extended period of time. Distance from the construction zone and buffering vegetation would minimize the temporary effects.

The construction would temporarily affect five of the nine CDFW wildlife areas adjacent to the Feather River in Sutter and Butte Counties. The CDFW wildlife areas provide unique recreation opportunities, including hunting. In all cases, there will be access to CDFW wildlife areas along the Feather River during construction no more than 8 miles away from any of the affected locations. Site-specific recreation opportunity locations are discussed for each affected location below, with the closest alternative location for a similar recreation experience listed.~~Construction would occur primarily between April 15 and November 30 over the course of more than one construction season, beginning with the northernmost reaches.~~

During construction of Alternative 1, the FRWLP would affect 0.5 acres, or 0.004% of the OWA. Construction is expected to affect the OWA during ~~2013~~ 2014 and ~~2014~~2015. The area affected is about 5.5 miles of the total 10.5 miles of levee on the west side of the Feather River within the OWA. The entire OWA would not be closed by the FRWLP, but the southwesterly ~~half~~ portion of the OWA closest to the Feather River levee would be. One of the five access points to OWA would be temporarily affected. The great majority of the OWA would be unaffected throughout construction and could provide opportunity for similar recreation experiences.

During construction, access to the Live Oak Park and Recreation Area would be blocked from Pennington Road and this facility would be closed. Construction is expected to affect the Live Oak Park and Recreation Area during ~~2013 and~~ 2014. Parks in the city of Live Oak, approximately one mile away, could provide similar day-use experiences for recreationists. Camping facilities in OWA, less than 10 miles away, would be unaffected throughout construction and provide camping opportunities near the Feather River for recreationists. The Gridley boat ramp, approximately 5 miles away, would be unaffected throughout construction and could provide Feather River access for boaters.

During construction, access to the management units of the FRWA on the west side of the Feather River from the landside of the levees would be blocked, but these management units could be accessed by boat. A 3.83 acre-area, or 6% of the Morse Road Unit of the FRWA, would be affected during construction. Construction is expected to affect the Morse Road Unit of the FRWA during 2013 through 2014. The Marysville Unit, approximately 5 miles away, would be unaffected throughout construction and could provide opportunity for similar recreation experiences. A ~~0.02~~ 4.55 acre area, or ~~0.02~~5% of the Shanghai Bend Unit of the FRWA, would be affected during construction. Construction is expected to affect the Shanghai Bend Unit of the FRWA during 2013 through ~~2015~~2014. A 13.26 acre-area, or 3% of the Abbott Lake Unit of the FRWA, would be affected

during construction. Construction is expected to affect the Abbott Lake Unit of the FRWA during 2014 through 2015. The Nelson Slough Unit, approximately eight miles away, would be unaffected throughout construction and could provide opportunity for similar recreation experiences. A 6.60 acre-area, or 1% of the O'Conner Lakes Unit of the FRWA, would be affected during construction. Construction is expected to affect the O'Conner Lakes Unit of the FRWA during 2014 through 2015. The Nelson Slough Unit, approximately six miles away, would be unaffected throughout construction and could provide opportunity for similar recreation experiences. For the affected FRWA units, other nearby alternative locations for similar recreation opportunities includes Gray Lodge Waterfowl Management Area, Sutter National Wildlife Refuge, and Sutter Bypass Wildlife Area.

Access to the Feather River Parkway Bike Trail, and Willow Island Park, Yuba City Boat Ramp, Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary would be blocked and these facilities would likely be closed during construction. Construction is expected to affect these facilities during 2013 through 20152014. The Sutter Bike Trail, approximately one mile away, would be unaffected throughout construction and could provide opportunity for similar bicycle recreation experiences. Veteran's Park, Peach Bowl Little League Fields, and Yuba Sutter Dog Park would not have primary access points blocked by levee construction. These facilities would likely remain open with proper safety measures and signage. Other parks within Yuba City would remain unaffected throughout construction and could provide opportunity for other day-use recreation experiences. Access to the Feather River would still be possible in Marysville.

Access to the Yuba City Boat Ramp and Boyd's Pump Boat Ramp would be blocked and these facilities would likely be closed during construction. Construction is expected to affect Yuba City Boat Ramp during 2013 through 2014 and Boyd's Pump Boat Ramp during 2014 through 2015. The Star Bend Boat Ramp, approximately eight miles away, would be unaffected throughout construction and could provide Feather River access for boaters.

Access to Bobelaine Audubon Sanctuary would be blocked and this facility would likely be closed during construction. A 0.31-acre area, or 0.07% of the Bobelaine Audubon Sanctuary, would be affected during construction. Construction is expected to affect Bobelaine Audubon Sanctuary during 2014 through 2015. The Nelson Slough Unit of the FRWA, approximately one mile away, would be unaffected throughout construction and could provide opportunity for similar recreation experiences.Veteran's Park, Peach Bowl Little League Fields, and Yuba Sutter Dog Park would not have primary access points blocked by levee construction. These facilities would likely remain open with proper safety measures and signage.

Even if the recreation areas themselves are not closed, proximity to construction equipment and activities (noise, visual effects, and smells) may degrade recreational experiences and likely disturb wildlife species normally inhabiting or present in wildlife and open space areas. This effect is temporary and highly localized; however, there are alternative locations for fishing, hunting, wildlife viewing, boating, and bicycling within 3 a few miles of the project area at other locations in Butte and Sutter Counties. Depending upon how many reaches would be under construction at one time, the distance recreationists would need to travel to a similar facility would vary. Levee access is restricted and controlled for the vast majority of the project area and the levee is not a major access corridor. With implementation of the environmental commitment requiring notification of construction area closure to ensure public safety and provide closure notice in advance of construction activities (described in Chapter 2, *Alternatives*), this effect would be less than significant. No mitigation is required.

Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor

Alternative 1 proposes seepage berms as a measure to reduce flood risk. In Alternative 1, a seepage berm is proposed along the levee next to the O'Connor Lakes Unit of the FRWA.

Seepage berms typically extend outward from the landside levee toe 300 to 400 feet and are one-third the height of the levee. Most recreation facilities along the Feather River levee are oriented towards the water, but are most often reached from the landside of the levee. Access to recreation facilities and resources would need to be replaced at each location to avoid effects on recreation.

In Alternative 1, 5.56 acres of the OWA (0.05%), 8.20 acres of the FRWA (0.5% of the FRWA on the west side of the Feather River), 0.03 acres of Veterans Park, and 4.10 acres (1.0%) of the Bobelaine Audubon Sanctuary would be displaced by the larger levee footprint. See Plate 3.14-2. The area of the recreation resources displaced by the larger levee footprint does not contain developed recreation facilities or infrastructure. The recreation opportunities within the area lost to the proposed project, such as hunting, hiking, and wildlife viewing, are not unique to the area of loss, but are allowed and supported by the remainder of the OWA and several nearby recreation facilities.

Following construction, recreational opportunities at OWA, facilities in Yuba City, existing recreation facilities and resources on the waterside of the levee would not be inundated longer or with a different frequency than they currently are. Once construction is completed, affected formal park facilities would be replaced onsite to the greatest degree possible; if not possible, SBFCA would work with the local agency and determine an appropriate location for recreation facility replacement. With implementation of the environmental commitment requiring reconstruction of affected formal park facilities and preservation of boat launch access during and following construction activities (described in Chapter 2, *Alternatives*), this effect would be less than significant. No mitigation is required.

In Alternative 1, the expanded project footprint would require some land acquisition. At this time the levee footprint of Alternative 1 would not be expanded in locations where there are landside or waterside parks or recreation resources, nor would the expanded levee footprint require permanent removal of park and recreation resources. If the project were to damage or require removal of park or recreation facilities within the project area, it would be considered a significant effect, given the dearth of formal recreational facilities in the planning area. SBFCA has made a commitment requiring reconstruction of affected formal park facilities and preservation of boat launch access during and following construction activities (see the environmental commitment to rebuild affected formal park facilities described in Chapter 2, *Alternatives*). With implementation of this environmental commitment, any affected park facilities would be rebuilt after construction of the project, and there would be no permanent loss of recreation opportunities.

Alternative 1 would not influence increases in population, change in land use, or change in transportation and access such that permanent, long-term recreation use would change in the project area to a degree that parks and recreation facilities would be subject to additional physical deterioration; the recreational characteristics of the river corridor and adjacent lands would be unchanged in terms of use, access, and facilities after construction of the FRWLP. Similarly, the FRWLP does not include or induce the construction or expansion of recreation facilities. There would be no change in existing permanent access as a result of the project~~since levee access is restricted and controlled for the vast majority of the project area~~. This effect would be less than significant. No mitigation is required.

3.14.4.3 Alternative 2

Alternative 2 addresses levee deficiencies primarily using seepage berms and stability berms, which would result in an expansion of the overall levee footprint. Cutoff walls, slope flattening, relief wells, fill of canals and pits, and drainage relief trenches would be implemented at select locations. Implementation of Alternative 2 would potentially result in effects on recreation. These potential effects and related mitigation measure requirements are summarized in Table 3.14-3 and discussed below.

Table 3.14-3. Recreation Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measures	With Mitigation
Effect REC-1: Temporary Changes in Recreational Opportunities during Construction	Less than significant	None required	Less than significant
Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor	Less than significant	None required	Less than significant

Seepage berms would be installed in the OWA, Live Oak Park and Recreation Area, FRWA (all 5 units in the FRWLP area), Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary. Stability berms would be installed in the OWA, FRWA (Morse Road Unit, Shanghai Bend Unit, and Abbott Lake Unit), and Bobelaine Audubon Sanctuary. Cutoff walls would be installed in the FRWA (Shanghai Bend Unit, Abbott Lake Unit, and Nelson Slough Unit), Feather River Parkway Bike Trail, Willow Island Park, Yuba City Boat Ramp, Peach Bowl Little League Fields, Yuba Sutter Dog Park, Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary. Levee slopes would be flattened on the waterside of the levee next to Feather River Parkway Bike Trail, Willow Island Park, Veteran's Park, and Yuba City Boat Ramp. Relief wells would be installed near or in the Feather River Parkway Bike Trail, Willow Island Park, Yuba City Boat Ramp, Peach Bowl Little League Fields, and Yuba Sutter Dog Park. Fill of canals and pits would occur and drainage relief trenches would be installed in the OWA.

Effect REC-1: Temporary Changes in Recreational Opportunities during Construction

This effect would be similar to that described above under Alternative 1; however, in Alternative 2, access to several more park and recreation facilities would be affected by the installation of landside seepage and stability berms.

During construction of Alternative 2, the FRWLP would affect 0.47 acres, or 0.004% of the OWA. The area affected is 5.5 miles of the total 10.5 miles of levee on the west side of the Feather River within the OWA. ~~A 0.02-acre area, or 0.02% of the Shanghai Bend Unit of the FRWA, would be affected during construction.~~

Seepage and stability berm installation would affect access and staging areas at more locations of the FRWA~~eather River Wildlife Area~~ than in Alternative 1, and access to OWA, Live Oak Park and Recreation Area, Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary may take longer to restore for recreational use in Alternative 2. With implementation of the environmental commitment requiring notification of construction area closure to ensure public safety and provide closure notice in advance of construction activities (described in Chapter 2, *Alternatives*), this effect would be less than significant. No mitigation is required.

Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor

In Alternative 2, 20.13 acres of the OWA (0.2%), 8.22 acres of the FRWA (0.5% of the FRWA on the west side of the Feather River), 0.03 acres of Veterans Park, and 5.54 acres (1.3%) of the Bobelaine Audubon Sanctuary would be displaced by the larger levee footprint. See Plate 3.14-2. The area of the recreation resources displaced by the larger levee footprint does not contain developed recreation facilities or infrastructure. The recreation opportunities within the area lost to the project such as hunting, hiking, and wildlife viewing, are not unique to the area of loss, but are allowed and supported by the remainder of the OWA and several nearby recreation facilities. For other recreation parks and facilities in the project area, this effect would be the same as described above under Alternative 1.

Seepage and stability berm installation in Alternative 2 could affect the long--term access to portions of the OWA, Live Oak Park and Recreation Area, the management units of the FRWA on the west side of the Feather River, Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary. The new topography on the approach side of each of these facilities may require the construction of new roadway and trail access, utility, parking, staging, and other facility or infrastructure improvements. With implementation of the environmental commitment requiring reconstruction of affected formal park facilities and preservation of boat launch access during and following construction activities (described in Chapter 2, *Alternatives*), this effect would be less than significant. No mitigation is required.

3.14.4.4 Alternative 3

Alternative 3 addresses deficiencies in the levee by blending the flood management measures identified in Alternatives 1 and 2, and by primarily using cutoff walls and seepage berms. Stability berms, slope flattening, relief wells, and weir structures would be implemented at select locations. Implementation of Alternative 3 would potentially result in effects on recreation. These potential effects and related mitigation measure requirements are summarized in Table 3.14-4 and discussed below.

Table 3.14-4. Recreation Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measures	With Mitigation
Effect REC-1: Temporary Changes in Recreational Opportunities during Construction	Less than significant	None required	Less than significant
Effect REC-3: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor	Less than significant	None required	Less than significant

Cutoff walls would be installed in the OWA, Live Oak Park and Recreation Area, FRWA (all five units in the FRWLP area), Feather River Parkway Bike Trail, Willow Island Park, Yuba City Boat Ramp, Peach Bowl Little League Fields, Yuba Sutter Dog Park, Boyd's Pump Boat Ramp, and Bobelaine Audubon Sanctuary. Seepage berms would be installed in the OWA, FRWA (O'Connor Lakes Unit and Nelson Slough Unit), and Bobelaine Audubon Sanctuary. Stability berms would be installed in the OWA and Bobelaine Audubon Sanctuary. Levee slopes would be flattened on the waterside of the levee next to Feather River Parkway Bike Trail, Willow Island Park, Veteran's Park, and Yuba City Boat Ramp. Relief wells would be installed near or in the FRWA (Shanghai Bend Unit), Feather River

Parkway Bike Trail, and Yuba Sutter Dog Park. Weir structures would not be installed in park or recreation facilities.

Effect REC-1: Temporary Changes in Recreational Opportunities during Construction

This effect would be similar to that described above under Alternatives 1 and 2. In Alternative 3, access to park and recreation facilities would be affected to a greater extent than in Alternative 1 and to a lesser extent than in Alternative 2 during construction. In Alternative 3, access and staging areas affected by seepage and stability berm installation would include the OWA and the FRWA.

During construction of Alternative 3, the FRWLP would affect 0.27 acres, or 0.002% of the OWA. The area affected is 5.5 miles of the total 10.5 miles of levee on the west side of the Feather River within the OWA. ~~A 0.02-acre area, or 0.02% of the Shanghai Bend Unit of the FRWA, would be affected during construction.~~ A 0.28-acre area, or 0.07% of the Bobelaine Audubon Sanctuary, would be affected during construction.

With implementation of the environmental commitment requiring notification of construction area closure to ensure public safety and provide closure notice in advance of construction activities (described in Chapter 2, *Alternatives*), this effect would be less than significant. No mitigation is required.

Effect REC-2: Long-Term or Permanent Loss of Recreation Opportunities in the Levee Corridor

In Alternative 3, 20.97 acres (0.2%) of the OWA, 5.78 acres (0.3% of the FRWA on the west side of the Feather River), 0.01 acres of Veterans Park, and 2.11 acres (0.5%) of Bobelaine Audubon Sanctuary would be displaced by the larger levee footprint. See Plate 3.14-2. The area of recreation resources displaced by the larger levee footprint does not contain developed recreation facilities or infrastructure. The recreation opportunities within the area lost to the project such as hunting, hiking, and wildlife viewing, are not unique to the area of loss, but are allowed and supported by the remainder of the OWA and several nearby recreation facilities.

Seepage and stability berm installation in Alternative 3 could affect the long-~~-~~term access to portions of the OWA; O'Connor Lakes Unit and Nelson Slough Unit of the FRWA; and Bobelaine Audubon Sanctuary. The new topography on the approach side of each of these facilities may require the construction of new roadway and trail access, utility, parking, staging, and other facility or infrastructure improvements. With implementation of the environmental commitment requiring reconstruction of affected formal park facilities and preservation of boat launch access during and following construction activities (described in Chapter 2, *Alternatives*), this effect would be less than significant. No mitigation is required.

3.15 Utilities and Public Services

3.15.1 Introduction

This section describes the regulatory and environmental setting for utilities and public services; effects on utilities and public services that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects. Additional information on utilities and public services is provided in Appendix G, *SBFCA, FRWLP Approach for Addressing Existing Levee Encroachments*.

3.15.2 Affected Environment

This section describes the affected environment for utilities and public services in the project area. Following are the key sources of data and information used in the preparation of this section.

- Sutter County General Plan Update Technical Background Report (Sutter County 2008).
- Sutter County General Plan (Sutter County 2011).
- Butte County General Plan 2030 (Butte County 2010).
- City of Yuba City General Plan (City of Yuba City 2004).
- SBFCA, Feather River West Levee Project, Approach for Addressing Existing Levee Encroachments Draft Memorandum, Wood Rodgers (2012); included in this document as Appendix G.
- SBFCA, Feather River West Levee Project, Project Description for CEQA/NEPA Analysis, Version 2.0, HDR and Wood Rodgers Design Team (2012).

3.15.2.1 Regulatory Setting

This section summarizes key regulatory information that applies to utilities and public services.

Federal

There are no applicable Federal policies related to utilities and public services.

State

California Public Utilities Commission

The CPUC regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies in the state. The CPUC is responsible for ensuring that California utility customers have safe, reliable utility service at reasonable rates, protecting utility customers from fraud, and promoting the health of California's economy. The CPUC establishes service standards and safety rules and authorizes utility rate changes, and enforces CEQA compliance for utility construction. The CPUC also regulates the relocation of electrical and gas transmission and distribution lines by public utilities under its jurisdiction, such as those owned by PG&E. The CPUC's General Order (GO) 131-D requires PG&E to obtain a discretionary permit

before relocating electrical facilities with voltages greater than 50 kilovolts. PG&E may be able to follow a simpler notice process rather than obtaining a formal permit if (1) the proposed project has undergone CEQA review as part of a larger project and (2) the final CEQA document finds no significant unavoidable environmental impacts as a result of PG&E's construction-related activities. Thus, for the electrical relocation work required for the FRWL project, PG&E may be able to rely on the Final EIS/EIR to expedite its permitting requirements under GO 131-D. If a project qualifies for the exemption, GO 131-D requires only a Notice of Construction with an opportunity for public review and comment.~~CPUC regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies in the state. CPUC is responsible for ensuring that California utility customers have safe, reliable utility service at reasonable rates, protecting utility customers from fraud, and promoting the health of California's economy. CPUC establishes service standards and safety rules and authorizes utility rate changes. CPUC enforces CEQA compliance for utility construction. CPUC also regulates the relocation of power lines by public utilities under its jurisdiction, such as The Pacific Gas and Electric Company (PG&E). CPUC works with other state and Federal agencies in promoting water quality, environmental protection, and safety.~~

California Integrated Waste Management Act

In 1989, AB 939, known as the Integrated Waste Management Act, was passed into law. Enactment of AB 939 established the California Integrated Waste Management Board and set forth aggressive solid waste diversion requirements. Under AB 939, every city and county in California is required to reduce the volume of waste sent to landfills by 50% through recycling, reuse, composting, and other means. AB 939 requires counties to prepare a countywide integrated waste management plan (CIWMP). An adequate CIWMP contains a summary plan that includes goals and objectives, a summary of waste management issues and problems identified in the incorporated and unincorporated areas of the county, a summary of waste management programs and infrastructure, existing and proposed solid waste facilities, and an overview of specific steps that would be taken to achieve the goals outlined in the components of the CIWMP.

Local

Butte County

The Butte County General Plan 2030 presents its policies regarding utilities and public services in the Public Facilities and Services element (Butte County 2010). Goals and policies that may influence the FRWLP include the following.

Goals

- **Goal PUB-2:** Provide adequate fire protection and emergency medical response services to serve existing and new development.
- **Goal PUB-9:** Provide safe, sanitary and environmentally acceptable solid waste management.
- **Goal PUB-12:** Manage wastewater treatment facilities at every scale to protect the public health and safety of Butte County residents and the natural environment.

Policies

- **Policy PUB-P9.3:** Innovative strategies shall be employed to ensure efficient and cost-effective solid waste and other discarded materials collection, disposal, transfer, and processing.

Sutter County

The Sutter County General Plan presents its policies regarding utilities and public services in the Infrastructure and Public Services elements (Sutter County 2011). Goals and policies that may influence the FRWLP include the following.

Goals

- **Goal I2:** Ensure efficient and safe collection, treatment, and disposal of wastewater, biosolids, and septage.
- **Goal I3**: Ensure stormwater runoff is collected and conveyed safely and efficiently.
- **Goal I4**: Ensure safe and efficient disposal of solid waste generated in Sutter County, while reducing the county's waste stream.
- **Goal I6**: Provide state-of-the-art telecommunication services for households, businesses, institutions, and public agencies throughout the county.
- **Goal PS 2**: Protect life and property from the risk of fire, and provide for coordinated emergency medical services.

Policies

- **Policy I1.10**: New individual wells shall meet county well construction and water quality standards.
- **Policy I2.10**: Groundwater Protection. Continue to regulate the siting, design, construction, and operation of wastewater disposal systems in accordance with County regulations to minimize contamination of groundwater supplies.
- **Policy I4.1**: Reduced Waste Stream. Implement, as appropriate, the reduction measures in the Climate Action Plan targeted to reduce the County's waste stream. Such measures may include reducing solid waste, diverting construction waste, and educating the public on solid waste reduction and recycling.
- **Policy I6.3**: Location. Ensure that the location and design of telecommunication facilities is functionally an aesthetically compatible with adjacent uses.

Yuba City

The City of Yuba City General Plan presents its policies regarding utilities and public services in the Public Utilities and Noise and Safety element (City of Yuba City 2004). Goals and policies that may influence the FRWLP include the following.

Guiding Policies

- **7.1-G-3:** Maintain existing levels of water service by preserving and improving infrastructure, replacing water mains as necessary, and improving water transmission facilities.
- **7.2-G-1:** Ensure that adequate wastewater treatment capacity is available to serve existing and future needs of the City.
- **7.3-G-1:** Meet the City's solid waste disposal needs, while maximizing opportunities for waste reduction and recycling.
- **9.4-G-3:** Maintain current police and fire response times and staffing ratios.

Implementing Policies

- **7.2-I-1:** Maintain existing levels of wastewater service by preserving and improving infrastructure, including replacing sewer mains as necessary.
- **7.3-I-6:** Comply with state requirements for proper handling and storage of solid waste and recyclables and diversion of solid waste from landfills.
- **9.4-I-4:** Require adequate access for emergency vehicles, including adequate street width and vertical clearance on new streets.

3.15.2.2 Environmental Setting

This section discusses the environmental setting related to utilities and public services in the project area, defined as the flood management footprint, which consists of the levee and berm itself and the landside and waterside operation and maintenance corridor (land 20 feet from the landside levee or berm toe and land 15 feet from the waterside levee toe). For the purposes of this analysis, the project area consists of the above and underground utilities and service systems that intersect and provide service to customers in and adjacent to the project area.

Electric and Natural Gas Transmission and Distribution~~Electric Power Transmission and Natural Gas~~

Electricity purchased from PG&E by local customers in Sutter and Butte counties is generated and delivered to the counties by a statewide network of power plants and electrical transmission and distribution lines. Natural gas service is provided by PG&E to urbanized areas of Yuba City. In parts of Sutter and Butte counties not served by PG&E's gas transmission and distribution network, including many of the counties' rural areas, residents and businesses make use of liquid propane gas (LPG) or other tanked or bottled gas for heating and cooking.~~PG&E provides Sutter and Butte counties with most of its electricity. The city of Gridley has its own electrical power company, Gridley Municipal Utilities Department, which distributes electricity purchased from the federal government to residents within the city limits. Electricity purchased from PG&E by local customers in Sutter and Butte counties is generated and transmitted to the county by a statewide network of power plants and transmission lines. Natural gas service is provided by PG&E to the urbanized areas of Yuba City. In parts of Sutter and Butte counties not served by PG&E's gas distribution network, including many of the counties' rural areas, residents and businesses make use of liquid propane gas (LPG) or other tanked or bottled gas for heating and cooking.~~

Water Service

Domestic

The domestic water service in the unincorporated areas of the project area is primarily through groundwater from privately owned wells. The Yuba City Utilities Department provides and distributes water service to Yuba City residents through pipes along roads in its service area. The Yuba City Utilities Department uses both surface water, diverted from the Feather River, and groundwater supplies for water service. Yuba City has three existing storage tanks located at the Yuba City water treatment facility for a total of 8 million gallons (MG) of storage. Located throughout the water distribution system are four additional tanks with a total volume of 9 MG.

Agricultural

Irrigation water for use within the project area is maintained and operated by several irrigation water companies and districts. The existing agricultural irrigation entities in the project area include the Garden Highway Mutual Water Company, Feather Water District, Tudor Mutual Water Company, Oswald Water District, Sutter Extension Water District, Butte Water District, and the Biggs–West Gridley Water District. The sources of irrigation water are diversions from the Feather River and private agricultural groundwater wells. During shortages of surface water, some of the irrigation districts and companies are able to supplement the surface water supplies with use of groundwater or through surface water purchases from other sources. When agricultural water supply is located within a reclamation district or stormwater management district, it is common practice for pumps to be placed in the drainage channels to reuse the tailwater from these channels.

Stormwater and Drainage

Stormwater management in the project area is a cooperative effort between a variety of agencies including Sutter and Butte counties, cities of Yuba City and Gridley, the local reclamation districts, and the state of California. The state and the local reclamation districts share responsibility for the levees that control flooding from the river. The counties and cities in the project area share responsibility with the reclamation districts for stormwater infrastructure inside the project area. The project lies within the following reclamation and drainage districts: Reclamation Districts 1, 9, and 777, Gilsizer Drainage District, Butte County Drainage District No. 1, and the Sacramento–San Joaquin Drainage District. Stormwater drainage throughout much of the project area is collected through a system of ditches, culverts, and underground storm sewers, and ultimately flows to, or sometimes is pumped into, the Feather River, Sacramento River, or the Sutter Bypass.

Wastewater

There are two different methods of wastewater treatment and disposal currently used in the project area: municipal wastewater treatment plants (WWTPs)and individual on-site wastewater disposal systems, which are generally referred to as private septic systems. Larger urban areas require the organization and treatment capabilities provided by a municipal wastewater facility, whereas rural areas in the county employ individual on-site systems. Yuba City is the only municipality within the project area that operates and maintains a sanitary sewer collection system and wastewater treatment facility. The sewer collection systems convey the wastewater from the homes and businesses within Yuba City limits to the Yuba City WWTP. Yuba City's WWTP was expanded in 2005 to provide an average dry weather flow (ADWF) capacity of 10.5 million gallons per day (mgd). For the summer of 2007, the ADWF was approximately 5.5 mgd, and the current peak day wet weather flow rate is approximately 8.5 mgd. The WWTP discharges secondary, disinfected effluent to the Feather River.

Solid Waste Disposal

The nearest solid waste facilities to the project area is the Ostrom Landfill in Yuba County serving the Yuba Sutter Regional Waste Management Authority, a joint powers agreement between Sutter and Yuba counties; the cities of Live Oak, Marysville, Wheatland, and Yuba City; and the Neal Road Landfill in Butte County.

The Ostrom Road Landfill is located in Wheatland and is owned and operated by Norcal Waste Systems Ostrom Road LF Inc. The Ostrom Road Landfill is east of the project site, approximately

30 road miles from the southern end of the project at Reach 2, and approximately 35 road miles from the city of Gridley and Reach 31. The 225 acre Class II landfill is permitted to accept the following types of waste: solid waste; waste water treatment sludge; construction debris; food and green waste; some types of contaminated soils; and non-friable asbestos. The landfill can accept a maximum of 3,000 tons of waste a day and has a total maximum permitted capacity of 43,467,231 cubic yards. In 2007, the Ostrom Road Landfill was reported to have 39,223,000 cubic yards of remaining capacity (90% of total capacity) and it is estimated to have enough capacity to remain open until the year 2066 (CalRecycle 2012).

The Neal Road Recycling and Waste Facility is located 7 miles southeast of Chico directly north of the project, on 190 acres owned by Butte County. The Neal Road Facility is 25 miles north of the project at Reach 40. The Neal Road Facility is permitted with a total maximum permitted capacity of 25,271,900 cubic yards and permitted to accept municipal solid waste, inert industrial waste, demolition materials, special wastes containing nonfriable asbestos; and septage. In June 2011, the Neal Road Landfill was reported to have 20,396,081 cubic yards of remaining capacity (80% of total capacity) (Dugger 2012). According to the Butte County General Plan 2030 (2010), current projections suggest that the Neal Road Facility has capacity to last through 2034, based upon current waste volumes, and the county is undertaking efforts to investigate the possible expansion of the facility to serve future capacity needs.

Telecommunications

Telephone, cable television, and other telecommunications services are provided by a variety of private companies in the project area. Telecommunications are primarily provided by AT&T and Comcast for telephone, internet, and cable television. Cellular phone service providers in the area include T-Mobile, Verizon, Metro PCS, Virgin Mobile, and Net 10. Infrastructure necessary to provide these services including fiber optic lines, above and below ground services lines, and internet remote terminals are located strategically throughout Sutter and Butte counties.

Utility and Service System Encroachments

An inventory of existing utilities and encroachments within the project area was developed by MHM Engineers and is located in the appendix of the SBFCA, Feather River West Levee Project, Approach for Addressing Existing Levee Encroachments Draft Memorandum in Appendix G of this document. The inventory was completed through field reconnaissance of the project site, review of the CVFPB encroachment permit logs, USACE's Periodic Inspection Reports, and as-built documentation of various projects located along the project alignment. There are approximately 430 utility encroachments listed in the inventory. Typical utility encroachments include pressure pipelines (water supply pipelines from waterside pump stations and drainage pipelines from landside drainage pump stations), gravity drainage pipes, gas lines, telephone utilities, overhead and underground electric and gas utilities~~overhead utilities~~, fiber optic cables, and other types and variations.

The inventory is comprehensive and includes utilities that comply with the CVFPB and USACE utility placement standards within a levee operation and maintenance area, and would not be affected by the project; and utilities that do not comply with the CVFPB and USACE utility placement standards within a levee operation and maintenance area, or do comply with utility placement standards but would be affected by project construction. Of those utilities that fall into the latter distinction, these utilities would be addressed either by SBFCA or a local maintenance agency over time, by the levee

project contractor during construction, or by SBFCA or the levee project contractor in advance of levee project construction.

Public Services

Fire Services

Fire protection and emergency services within the project area are provided by the Yuba City Fire Department, Sutter County Fire Department, and Butte County Fire Department. The Yuba City Fire Department currently staffs five engine companies in its five fire stations. Stations 1, 2, 3, and 4 are located within Yuba City's city limits. Station 7 in Tierra Buena also provides initial response service in the Yuba City Planning Area. The Sutter County Fire Department operates three fire stations near the project, the Oswald-Tudor Station located in Yuba City, the Sutter Station located in Sutter, and the Live Oak Station located in Live Oak. The Butte County Fire Department operates three stations in Gridley and one station in Biggs.

Police Services

Law enforcement services in the project area are provided by the Sutter County Sheriff's Department, the Butte County Sherriff's Department, and the Yuba City Police Department. The Yuba City Police Department currently operates a staff of 45 sworn peace officers and 26.5 civilian staff members augmented by 19 part-time reserve peace officers, 35 volunteers and 10 police cadets.

3.15.3 Environmental Consequences

This section describes the environmental consequences relating to utilities and public services for the FRWLP. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.15.3.1 Assessment Methods

This quantitative evaluation of utilities and public services is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

This evaluation of utilities and public services is based on information obtained from the following sources.

- Review of relevant documents and Web sites to obtain information regarding known utilities and public services in the project area.
- Analysis of geographic map research to determine locations of existing utilities and public services for project components.
- Telephone calls and e-mail correspondence to area utility and public service providers.

3.15.3.2 Determination of Effects

For this analysis, an effect pertaining to utilities and public services was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, state CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Require the construction or expansion of electrical or natural gas transmission or distribution facilities.
- Require the construction or expansion of a water conveyance or wastewater treatment facility or require new or expanded water supply entitlements.
- Require the construction of new or expanded stormwater drainage facilities.
- Cause the capacity of a solid waste landfill to be reached sooner than it would without the project.
- Require the construction or expansion of communications facilities (telephone, cell, cable, satellite dish).
- Significantly affect public utility facilities that are located underground or aboveground along the local roadways as a result of project construction activities.
- Create an increased need for new fire protection, police protection, or ambulance services or significantly affect existing emergency response times or facilities.
- Intersect with major infrastructure components, such as bridges or overpasses, requiring relocation of the components.

Effects Assumptions

The following assumptions are made as part of the analysis of effects on utilities and public services.

- Implementation of the proposed project is not expected to create additional demand for electricity or natural gas and would not require the construction or expansion of electrical or natural gas transmission lines or public utilities.
- Implementation of the proposed project would not require the construction or expansion of wastewater treatment facilities, nor would it require the relocation of major infrastructure.

3.15.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning utilities and public services are summarized in Table 3.15-1.

Table 3.15-1. Summary of Effects for Utilities and Public Services

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply	Significant	UTL-MM-1: Coordinate with Water Supply Users before and during All Water Supply Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply	Less than significant
Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service	Significant	UTL-MM-2: Verify Utility Locations, Coordinate with Utility Providers, Prepare a Response Plan, and Conduct Worker Training	Less than significant
Effect UTL-3: Increase in Solid Waste Generation	Less than significant	None required	Less than significant
Effect UTL-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant

3.15.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but no construction-related effects relating to utilities and public services such as electric power, natural gas, and communications transmission, water supply, wastewater, and solid waste service, and stormwater drainage would occur. Therefore, there would be no effect on utilities and public services attributable to the implementation of the No Action Alternative.

However, without levee improvements, there is the continued risk of levee failure. Under-seepage and loss of levee foundation soils would be expected to continue. A catastrophic levee failure would result in collapse of levee slopes and loss of soil. Furthermore, if a levee breach were to occur, emergency construction and repair activities would be implemented without the use of BMPs and could result in the immediate disruption or loss of public utilities. Varying levels of damage could be done to public service structures as well, causing delays in fire protection, police protection, and emergency medical assistance. A major flood event could stress the region's emergency response and hospital services, as the likelihood of injury resulting from a flood event is high, and evacuees may not have access to their regular medications. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made.

3.15.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on utilities and public services. These potential effects and related mitigation measure requirements are summarized in Table 3.15-2 and discussed below.

Table 3.15-2. Utilities and Public Services Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measures	With Mitigation
Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply	Significant	UTL-MM-1: Coordinate with Water Supply Users before and during All Water Supply Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply	Less than significant
Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service	Significant	UTL-MM-2: Verify Utility Locations, Coordinate with Utility Providers, Prepare a Response Plan, and Conduct Worker Training	Less than significant
Effect UTL-3: Increase in Solid Waste Generation	Less than significant	None required	Less than significant
Effect UTL-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant

Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply

As described in Utility and Service System Encroachments, implementation of Alternative 1 requires modifications to irrigation, drainage, and domestic water supply infrastructure. Water supply, and irrigation and drainage infrastructure in the project area include drainage canals like the Sutter Butte Main Canal; irrigation, water supply and drainage pipelines; waterside and landside pump stations, and agricultural wells. The water supply and drainage infrastructure in the footprint of the proposed flood management facilities would be removed and replaced in locations farther from the project footprint.

Repair, replacement, or relocation of infrastructure elements would provide water supply and drainage service equivalent to existing conditions. Construction of Alternative 1 could result in the need to temporarily take individual water supply and drainage infrastructure elements out of service for short periods. Because the potential for damage to water supply and drainage infrastructure could cause a delay in service, this potential construction effect is considered significant. Mitigation Measure UTL-MM-1 would reduce this potential effect to a less-than-significant level.

The timing of these replacements would be planned, to the extent feasible, to prevent disruptions of service.

Mitigation Measure UTL-MM-1: Coordinate with Water Supply Users before and during All Water Supply Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply

The project proponent will ensure the following measures are implemented to avoid and minimize potential for domestic and irrigation water supply interruptions during construction activities.

- Coordinate the timing of all modifications to domestic and irrigation water supply infrastructure with the affected infrastructure owners and water supply users.

- Include detailed scheduling of the phases of modifications or replacement of existing domestic and irrigation water supply infrastructure components in project design and in construction plans and specifications.
- Plan and complete modifications of irrigation infrastructure for the non-irrigation season to the extent feasible.
- Provide for alternative water supply, if necessary, when modification or replacement of irrigation infrastructure must be conducted during a period when it otherwise would be in normal use by an irrigator.
- Ensure either that users of irrigation water supply do not, as a result of physical interference associated with the project, experience a substantial interruption in irrigation supply when such supply is needed for normal, planned farming operations; or compensate users of irrigation water supply that experience a substantial decrease in an existing level of service (that meets the established standards for the project area) in kind for losses associated with the reduction in level of service.

Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service

As documented in Appendix G, the project levee has numerous encroachments that would be affected by the project because they present a threat to stability of the levee system, do not currently comply with levee encroachment placement criteria provided by USACE and CVFPB, or would be disrupted or otherwise affected by project construction.

Given the number of encroachments the project must address and the variable nature of how each would be addressed, levee encroachments affected by the project are divided into two categories: those that only encroach on the levee ~~right-of-way (~~ROW~~)~~, which make up the operation and maintenance area typically consisting of the land 20 feet from the landside levee or berm toe and the land 15 feet from the waterside levee toe, but in some cases PG&E facilities would be located greater than100 feet from the levee or berm toe; and those that encroach on the levee prism itself. The categories can be further divided into three subcategories: structural encroachments, wet utility encroachments, and dry utility encroachments. Structural encroachments consist of homes, sheds, roadways, railroad tracks, and structures in general. Wet utility encroachments are defined as facilities for agricultural, drainage, water supply, sewage, and natural gas systems (e.g., agricultural pipelines and wells). Dry utilities are defined as facilities for electrical and telecommunication systems (e.g., fiber optic cables and aboveground electric poles).

In general, encroachments within the levee ROW would not be modified as part of the levee work, but by SBFCA or the local maintenance agency over time. Encroachments within the levee prism, structural encroachments and wet utility encroachments would be addressed by the levee construction contractor. Dry utility encroachments within the levee prism would be addressed in advance of the levee construction contactor's work to clear the way for levee construction.

Utility infrastructure could require significant actions to repair, relocate, or replace. Additionally, Alternative 1 construction could necessitate that existing utilities be taken off line or could cause accidental damage to identified and unidentified infrastructure. Because the potential exists for damage and service interruptions to existing utilities, the effect of this potential construction effect is considered significant. Mitigation Measure UTL-MM-2 would reduce this potential effect to a less-than-significant level.

Mitigation Measure UTL-MM-2: Verify Utility Locations, Coordinate with Utility Providers, Prepare a Response Plan, and Conduct Worker Training

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

- Obtain utility excavation or encroachment permits as necessary before initiating any work with the potential to affect utility lines, and include all necessary permit terms in construction contract specifications.
- Before starting construction, coordinate with the CVFPB and utility providers in the area to locate existing lines and to implement orderly relocation of utilities that need to be removed or relocated. Avoid relocating utilities when possible. Provide notification of potential interruptions in services to the appropriate agencies.
- Before starting construction, verify utility locations through field surveys and the use of the Underground Service Alert services. Clearly mark any buried utility lines in the area of construction before any earthmoving activity.
- Before starting construction, prepare a response plan to address potential accidental damage to a utility line. The plan will identify chain-of-command rules for notifying authorities and appropriate actions and responsibilities to ensure the safety of the public and the workers. Contractors will conduct worker training to respond to these situations.
- Stage utility relocations to minimize service interruptions.

Effect UTL-3: Increase in Solid Waste Generation

During three years of construction, implementation of Alternative 1 may generate up to 819,097 cubic yards of solid waste that would require disposal. Sources of solid waste related to construction activities would include levee material, structural debris from removal of residences and agricultural structures, roadways, and utility infrastructure within the project footprint. The waste material resulting from the degradation of the existing levee could be disposed of onsite at the landside and waterside levee toes and used for new levee construction, if it is suitable material. Disposal of the soil material would occur if soil characteristics make it infeasible for reuse as levee material, or the soil is determined to have contaminants that would require appropriate disposal. Embankment fill material excavated to construct levee improvements would be evaluated for reuse after excavation and prior to disposal. Stripped and cleared vegetation resulting from project construction would be mulched and spread on the finished levee.

Solid waste requiring disposal as part Alternative 1 likely would be transported to the Ostrom Road Landfill outside of Wheatland or the Neal Road Landfill outside of Chico, depending on the reach location of project construction. However, the location of the landfill used for disposal of construction-related waste may be determined by the construction contractor at the time of construction activity based on capacity, type of waste, and other factors. Only those landfills determined to have the ability to accommodate the construction disposal needs of Alternative 1 would be used.

As of 2007, the remaining waste capacity for the Ostrom Road Landfill was 39,223,000 cubic yards, and in 2011 the Neal Road Landfill reported a remaining waste capacity of 20,396,081 cubic yards.

Some of the disposed material may be deemed suitable by landfills for other beneficial uses. These materials would be stored only temporarily at the landfill and would not have an effect on its overcall capacity. The current landfill closure projections is 2066 at the Ostrom Road Landfill and 2034 at the Neal Road Landfill, which takes into account disposal growth rate, including both beneficial and non-beneficial soil materials. Assuming all of the estimated 819,097 cubic yards of waste material would require permanent disposal, Alternative 1 implementation would represent 2% of the Ostrom Road Landfill and 4% of the Neal Road Landfill remaining capacities. However, the option of beneficial reuse is likely to reduce the cubic yards of soil that require permanent disposal. These facts would make this effect less than significant. No mitigation is required.

Effect UTL-4: Increase in Emergency Response Times

Emergency access to the project vicinity could be affected by construction of the proposed project, and construction-related traffic could delay or obstruct the movement of emergency vehicles. However, execution of the environmental commitment to develop and implement a traffic control and road maintenance plan, described in Chapter 2, *Alternatives*, would minimize construction-related effects on emergency response times. This effect would be less than significant. No mitigation is required.

3.15.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on utilities and public services. These potential effects and related mitigation measure requirements are summarized in Table 3.15-3 and discussed below.

Table 3.15-3. Utilities and Public Resources Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measures	With Mitigation
Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply	Significant	UTL-MM-1: Coordinate with Water Supply Users before and during All Water Supply Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply	Less than significant
Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service	Significant	UTL-MM-2: Verify Utility Locations, Coordinate with Utility Providers, Prepare a Response Plan, and Conduct Worker Training	Less than significant
Effect UTL-3: Increase in Solid Waste Generation	Less than significant	None required	Less than significant
Effect UTL-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant

Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply

Effects associated with Effect UTL-1 under Alternative 2 are identical to those described above for Effect UTL-2 under Alternative 1. Implementation of Mitigation Measure UTL-MM-1, described above under Alternative 1 would reduce this potential effect to a less-than-significant level.

Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service

Effects associated with Effect UTL-2 under Alternative 2 are identical to those described above for Effect UTL-2 under Alternative 1. Implementation of Mitigation Measure UTL-MM-2, described above under Alternative 1 would reduce this potential effect to a less-than-significant level.

Effect UTL-3: Increase in Solid Waste Generation

Implementation of Alternative 2 may generate up to 378,800 cubic yards of solid waste that would require disposal. Sources of solid waste related to construction activities would include levee material, structural debris from removal of residences and agricultural structures, roadways, and utility infrastructure within the project footprint. The waste material resulting from the degradation of the existing levee could be disposed of onsite at the landside and waterside levee toes and used for new levee construction, if it is suitable material. Disposal of the soil material would occur if soil characteristics make it infeasible for reuse as levee material, or the soil is determined to have contaminants that would require appropriate disposal. Embankment fill material excavated to construct levee improvements would be evaluated for reuse after excavation and prior to disposal. Stripped and cleared vegetation resulting from project construction would be mulched and spread on the finished levee.

Solid waste requiring disposal as part Alternative 2 likely would be transported to the Ostrom Road Landfill outside of Wheatland or the Neal Road Landfill outside of Chico, depending on the reach location of project construction. However, the location of the landfill used for disposal of construction-related waste may be determined by the construction contractor at the time of construction activity based on capacity, type of waste, and other factors. Only those landfills determined to have the ability to accommodate the construction disposal needs of Alternative 2 would be used.

As of 2007, the remaining waste capacity for the Ostrom Road Landfill was 39,223,000 cubic yards, and in 2011 the Neal Road Landfill reported a remaining waste capacity of 20,396,081 cubic yards. Some of the disposed material may be deemed suitable by landfills for other beneficial uses. These materials would be stored only temporarily at the landfill and would not have an effect on its overcall capacity. The current landfill closure projections is 2066 at the Ostrom Road Landfill and 2034 at the Neal Road Landfill, which takes into account disposal growth rate, including both beneficial and non-beneficial soil materials. Assuming all of the estimated 378,800 cubic yards of waste material would require permanent disposal, Alternative 2 implementation would represent less 1% of the Ostrom Road Landfill and 1% of the Neal Road Landfill remaining capacities. However, the option of beneficial reuse is likely to reduce the cubic yards of soil that require permanent disposal. These facts would make this effect less than significant. No mitigation is required.

Effect UTL-4: Increase in Emergency Response Times

Effects associated with Effect UTL-4 under Alternative 2 are identical to those described above for Effect UTL-4 under Alternative 1. This effect would be less than significant. No mitigation is required.

3.15.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on utilities and public services. These potential effects and related mitigation measure requirements are summarized in Table 3.15-4 and discussed below.

Table 3.15-4. Utilities and Public Resources Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measures	With Mitigation
Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply	Significant	UTL-MM-1: Coordinate with Water Supply Users before and during All Water Supply Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply	Less than significant
Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service	Significant	UTL-MM-2: Verify Utility Locations, Coordinate with Utility Providers, Prepare a Response Plan, and Conduct Worker Training	Less than significant
Effect UTL-3: Increase in Solid Waste Generation	Less than significant	None required	Less than significant
Effect UTL-4: Increase in Emergency Response Times	Less than significant	None required	Less than significant

Effect UTL-1: Potential Temporary Disruption of Irrigation/Drainage Facilities and Agricultural and Domestic Water Supply

Effects associated with Effect UTL-1 under Alternative 3 are identical to those described above for Effect UTL-2 under Alternative 1. Implementation of Mitigation Measure UTL-MM-1, described above under Alternative 1 would reduce this potential effect to a less-than-significant level.

Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service

Effects associated with Effect UTL-2 under Alternative 2 are identical to those described above for Effect UTL-2 under Alternative 1. Implementation of Mitigation Measure UTL-MM-2, described above under Alternative 1 would reduce this potential effect to a less-than-significant level.

Effect UTL-3: Increase in Solid Waste Generation

Implementation of Alternative 3 may generate up to 813,152 cubic yards of solid waste that would require disposal. Sources of solid waste related to construction activities would include levee material, structural debris from removal of residences and agricultural structures, roadways, and utility infrastructure within the project footprint. The waste material resulting from the degradation of the existing levee could be disposed of onsite at the landside and waterside levee toes and used for new levee construction, if it is suitable material. Disposal of the soil material would occur if soil characteristics make it infeasible for reuse as levee material, or the soil is determined to have contaminants that would require appropriate disposal. Embankment fill material excavated to construct levee improvements would be evaluated for reuse after excavation and prior to disposal. Stripped and cleared vegetation resulting from project construction would be mulched and spread on the finished levee.

Solid waste requiring disposal as part Alternative 3 likely would be transported to the Ostrom Road Landfill outside of Wheatland or the Neal Road Landfill outside of Chico, depending on the reach location of project construction. However, the location of the landfill used for disposal of construction-related waste may be determined by the construction contractor at the time of construction activity based on capacity, type of waste, and other factors. Only those landfills determined to have the ability to accommodate the construction disposal needs of Alternative 3 would be used.

As of 2007, the remaining waste capacity for the Ostrom Road Landfill was 39,223,000 cubic yards, and in 2011 the Neal Road Landfill reported a remaining waste capacity of 20,396,081 cubic yards. Some of the disposed material may be deemed suitable by landfills for other beneficial uses. These materials would be stored only temporarily at the landfill and would not have an effect on its overcall capacity. The current landfill closure projections is 2066 at the Ostrom Road Landfill and 2034 at the Neal Road Landfill, which takes into account disposal growth rate, including both beneficial and non-beneficial soil materials. Assuming all of the estimated 813,152 cubic yards of waste material would require permanent disposal, Alternative 3 implementation would represent 2% of the Ostrom Road Landfill and 4% of the Neal Road Landfill remaining capacities. However, the option of beneficial reuse is likely to reduce the cubic yards of soil that require permanent disposal. These facts would make this effect less than significant. No mitigation is required.

Effect UTL-4: Increase in Emergency Response Times

Effects associated with Effect UTL-4 under Alternative 3 are identical to those described above for Effect UTL-4 under Alternative 1. This effect would be less than significant. No mitigation is required.

3.16 Public Health and Environmental Hazards

3.16.1 Introduction

This section describes the regulatory and environmental setting for public health and environmental hazards; effects on public health and environmental hazards that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects. Additional information on public health and hazards is provided in Appendix H.

3.16.2 Affected Environment

This section describes the affected environment for public health and environmental hazards in the project area. Following are the key sources of data and information used in the preparation of this section.

- Environmental Site Assessment, Sutter Basin Feasibility Study, Sutter and Butte Counties (U.S. Army Corps of Engineers 2012).
- Sutter County General Plan (Sutter County 2011).
- City of Yuba City General Plan (City of Yuba City 2004).
- City of Live Oak 2030 General Plan (City of Live Oak 2010).
- Butte County General Plan 2030 (Butte County 2010).
- City of Biggs General Plan 1997–2015 (City of Biggs 1998).
- City of Gridley 2030 General Plan (City of Gridley 2010).

3.16.2.1 Regulatory Setting

This section summarizes key Federal and state regulatory information that applies to public health and environmental hazards. Additional regulatory information appears in Appendix A.

Federal

The following Federal policies related to public health and environmental hazards may apply to implementation of the proposed project. Two key federal regulations pertaining to hazardous wastes are described below. Other applicable federal regulations are contained primarily in CFR Titles 29, 40, and 49.

Resource Conservation and Recovery Act

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

Comprehensive Environmental Response, Compensation, and Liability Act

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

State

The following State policies related to public health and environmental hazards may apply to implementation of the proposed project.

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. Hazardous materials are defined as unsafe raw or unused material that is part of a process or manufacturing step. They are not considered hazardous waste. Health concerns pertaining to the release of hazardous materials, however, are similar to those relating to hazardous waste.

Hazardous Waste Control Act

The Hazardous Waste Control Act created the state hazardous waste management program, which is similar to, but more stringent than, the Federal Resource Conservation and Recovery Act program. The act is implemented by regulations contained in Title 26 CCR, which describes the following elements required for the proper management of hazardous waste.

- Identification and classification.
- Generation and transportation.
- Design and permitting of recycling, treatment, storage, and disposal facilities.
- Treatment standards.
- Operation of facilities and staff training.
- Closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the California Department of Toxic Substances and Control.

Emergency Services Act

Under the Emergency Services Act, the state developed an emergency response plan to coordinate emergency services provided by Federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Office of Emergency Services. The office coordinates the responses of

other agencies, including EPA, California Highway Patrol, RWQCBs, air quality management districts, and county disaster response offices.

Local

Butte County, Sutter County, City of Yuba City, City of Live Oak, City of Biggs, and City of Gridley each have adopted goals and policies related to public health and environmental hazards, detailed in Appendix A.

3.16.2.2 Environmental Setting

The following considerations are relevant to environmental and public safety conditions in the proposed project area.

The project area is located in the north-central part of California, and its boundaries include the Sacramento River to the west and the Feather River to the east. Its southern boundary is just downstream of the confluence of the Sacramento River with the Sutter Bypass, and includes the urban areas of Yuba City, Live Oak, Gridley, and Biggs in the Sutter Bypass. As described in the preliminary Environmental Site Assessment prepared by USACE, levees surrounding the project area protect a substantial number of improvements including residential homes, commercial structures, farm houses and buildings, and semipublic structures (U.S. Army Corps of Engineers 2012). The preliminary Environmental Site Assessment looked at a limited portion of the current study area, focusing on the areas surrounding (up to 0.25 mile) existing ~~flood control~~ levees.

For ease of investigating, the preliminary Environmental Site Assessment divided the project area into seven sites, but only four are used in this analysis.

1. **Feather River North (Yuba).** This site roughly follows the Feather River from the Thermalito Afterbay to approximately Metteer Road or the Butte-Sutter county line. This section covers about 13.5 miles of the levee, and consists of Reaches 25–41.
2. **Feather River North (Sutter).** This section starts at the Butte-Sutter county line of the Feather River and goes south along the river to approximately Pease Road. This section is approximately 9.8 miles long, and consists of Reaches 18–25.
3. **Yuba City Levee.** This section of the project area starts at Pease Road on the Feather River and goes south through the Yuba City to the confines of the Feather River and the Yuba River. This section is approximately 12.5 miles long, and consists of Reaches 8–17.
4. **Feather River South.** Starting at Star Bend Road, this levee section goes south on Levee Road, which parallels SR 99. This section is approximately 9.3 miles long, and consists of Reaches 3–7.
5. **Sutter Bypass.** This section of the project area starts at the intersection of Feather River Levee Road and Sutter Bypass Levee Road and goes north along the Sutter Bypass for approximately 17.5 miles.

3.16.2.3 Hazardous Materials

Hazardous materials are chemicals and other substances defined as hazardous by Federal and state laws and regulations. In general, these materials are substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may have harmful effects on public health or the environment during their use or when released to the environment. Hazardous materials also include waste chemicals and spilled materials.

Potential Sources of Hazardous Materials

The project area consists of urban, suburban, and rural areas. Potential sources of hazardous materials and waste may exist in the urbanized as well as agricultural areas adjacent to the levees. The following hazardous materials may be present in the project area in a variety of common contexts.

- Pesticides, herbicides, and fertilizers associated with agricultural lands.
- Petroleum hydrocarbons.
- Underground storage tanks.
- Contaminated debris.
- Lead associated with paints and structures.
- Wastewater.
- Pits or ponds.
- Stormwater runoff structures.
- Transformers that may contain PCBs.

Known Sources of Hazardous Materials

The Department of Toxic Substances Control's (DTSC's) Envirostor database provides access to detailed information on hazardous waste permitted and corrective action facilities within California, as well as existing site cleanup information. According the Envirostor Database, the following known sources of hazardous materials are located adjacent to or along project levees, and consist of evaluation sites, voluntary cleanup, and permitted hazardous waste sites (U.S. Army Corps of Engineers 2012). Evaluation sites are typically (1) in the preliminary phase of a site investigation, or (2) were found to have no contamination. The sites located within the project area have been organized by study reaches in Table 3.16-1.

Further, the project would involve the removal and replacement of existing wood distribution and power poles and related equipment. Oil and treated wood project storage onsite requires secondary containment, managed storage, and labeling with manifested disposal/recycling processing. Insulators will be stored separately and recovered. The existing treated wood poles would be collected in project-specific containers once removed from the site, and would be disposed of at a licensed Class 1 or a composite-lined portion of a solid waste landfill.

Table 3.16-1. Known Hazardous Materials Sources

Environmental Site Assessment Study Reaches	Project Reaches Covered	HTRW Sites Located
Feather River North (Yuba)	25–41	Four USTs
		One landfill
		Two reports on the HAZNET database
Feather River North (Sutter)	18–25	Seven USTs
		One waste discharge system
		Three reports on the HAZNET database
		One RCRA-SQG or small quantity generator
Yuba City Levee		33 USTs*
		One landfill
		Two ASTs
		Four RCRA-SQG or small quantity generators
		One pesticide producer
	8–17	One SuperFund site (Onstott Dusters, Inc.)
		Three sites on the SLIC database
		58 reports on the HAZNET database
		11 sites on the CDL database
Feather River South	3–7	One site on the CDL database

Source: Environmental Site Assessment Sutter Basin Feasibility Study 2012, except Onstott Dusters, Inc., which was obtained from the EPA website at http://ofmpub.epa.gov/.

* Five of which are on the LUST list.

AST = aboveground storage tank.
CDL = California digital library.
HTRW = hazardous, toxic, or radioactive waste.
LUST = leaking underground storage tank.
RCRA-SQG = Resource Conservation and Recovery Act small quantity generators.
UST = underground storage tank.
SLIC = spills, leaks, investigations, and cleanup.

3.16.2.4 Agricultural Lands

There are large tracts of agricultural lands throughout the counties in the project area. Agricultural lands are known to have various pesticides, herbicides, and fertilizers in their soils, and can pose a risk to local and regional water quality because these areas are largely considered floodplain for the Sacramento River. The river elevation fluctuates seasonally and the groundwater elevation is assumed to fluctuate with river levels. During periods of low flow, it is likely that groundwater flows from agricultural lands toward the river and that any contaminated water could be transported to the soils within and near the levees.

3.16.2.5 Wildland Fires

The large areas of undeveloped, agricultural, and forested land in the project area pose a serious risk for wildland fires. These areas are largely fallow agricultural lands or lands that are composed primarily of annual grasses that become dry during summer months, raising the risk of grassland fire. Areas of this type are found throughout the project area; however, wildland fire risk is greater in rural locations.

Various city and county agencies are responsible for controlling and responding to wildland fires. City fire departments are responsible for responding to fires in areas that are incorporated into cities and towns within the project area. Many unincorporated areas have formed fire districts that are primarily protected by county fire departments. Other entities involved in wildland fire protection are the California Department of Forestry and Fire Protection and the U.S. Forest Service. Some areas within the project area also have volunteer fire departments for fighting wildland fires. Refer to Section 3.15, *Utilities and Public Services*, for a detailed discussion.

3.16.2.6 Emergency Response

Emergency response and evacuation services for the project area are provided by various departments in the counties and cities nearest to the project area, including, but not limited to, sheriff, fire, and emergency services departments. Fire protection and emergency services provided within the project area are described in Section 3.15, *Utilities and Public Services*.

3.16.3 Environmental Consequences

This section describes the environmental consequences relating to environmental and public safety for the proposed project. It describes the methods used to determine the effects of the project and lists the thresholds used to conclude whether an effect would be significant. The effects that would result from implementation of the project, findings with or without mitigation, and applicable mitigation measures are presented in a table under each alternative.

3.16.3.1 Assessment Methods

This evaluation of public health and environmental hazards is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

The evaluation of potential effects on public health and environmental hazards addresses the potential for health and safety hazards during construction of the levee improvements. The analysis includes evaluation of the potential effects related to construction activities on workers, and general safety of, and hazards, to both workers and the public posed by construction, operations, and maintenance associated with implementation of the proposed project.

The Sacramento District of the USACE conducted a~~n~~ preliminary Environmental Site Assessment in June–July of 2009. The preliminary Environmental Site Assessment is meant to identify recognized environmental conditions, including presence or likely presence of any hazardous substance or petroleum products under conditions that indicate an existing release, a past release, or the material threat of a release into structures, the ground, groundwater, or surface waters of the property (U.S. Army Corps of Engineers 2012). Information was gathered for this report by conducting a pre-site visit search, and a site visit to verify listed Hazardous, Toxic, or Radioactive Waste (HTRW threats) and discover new ones. Results of the preliminary Environmental Site Assessment included:

- 51 registered underground storage tanks (USTs) and 3 aboveground storage tanks (ASTs).
- Five sources are listed as small and large generators of EPA-regulated hazardous waste.
- Five sites that had leaking USTs, two of which have or had affected public drinking water.

- Six known or potential hazardous substance sites under investigation or cleanup.
- Two waste discharge systems.
- Two landfills.
- 12 suspected drug labs.
- One pesticide-producing facility.

One additional site not included in the preliminary Environmental Site Assessment was a SuperFund site (Onstott Dusters, Inc.). For the majority of the sources, no records were found to indicate that these potential sources have actually caused major contamination, although investigations are still on-going. Several areas of concern were revealed during the investigation. Most of these areas of concern involve registered USTs, hazardous waste generators, minor tank leaks, UST removal and remediation, and accidental releases. During records research and field surveys, no known contamination due to HTRW was confirmed within the construction zone. In conclusion, no evidence was found to indicate that any other potential sources of contamination would interfere with any planned construction of the levees.

3.16.3.2 Determination of Effects

For this analysis, an effect pertaining to public health and environmental hazards was analyzed under NEPA and CEQA if it would result in any of the following environmental effects, which are based on NEPA standards, State CEQA Guidelines Appendix G (14 CCR 15000 et seq.), and standards of professional practice.

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials to the environment.
- Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.
- Be located on a site that is on a list of hazardous materials sites compiled pursuant to California Government Code 65962.5, and as a result would create a significant hazard to the public or the environment.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Significantly affect drinking water quality.

3.16.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning public health and environmental hazards are summarized in Table 3.16-2.

Table 3.16-2. Summary of Effects for Public Health and Environmental Hazards

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction	Significant	Environmental Commitment: Stormwater Pollution Protection Plan	Less than significant
Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities	Significant	Environmental Commitment: Stormwater Pollution Protection Plan PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures PH-MM-2: Employment of a Toxic Release Contingency Plan	Less than significant
Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site and Vehicles	Significant	PH-MM-3: Implementation of Construction Site Safety Measures PH-MM-4: Implementation of an Emergency Response Plan	Less than significant
Effect PH-4: Exposure of People or Structures to Increased Flood Risk	Beneficial	None required	Beneficial

3.16.4.1 No Action Alternative

The No Action Alternative represents the continuation of the existing deficiencies along the portion of the Feather River in the FRWLP area. Current levee operations and maintenance activities would continue, but there would be no change in the geomorphic and flood ~~control~~ risk management regimes relative to existing conditions.

Under the No Action Alternative, no construction activities associated with the project would occur. Thus the proposed project would not result in accidental spills of hazardous materials, nor would there be any effect on emergency response, as there would be no interference with emergency response routes.

However, without levee improvements to the project area, the risk of levee failure would remain high. A levee failure within the FRWLP project area could result in flooding that would upset stored hazardous materials and spread agricultural pesticides, oil, gasoline, and other hazardous materials in floodwaters, creating hazardous conditions for the public and the environment. The timing, duration, magnitude, and location for such an occurrence cannot be predicted.

3.16.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on public health and environmental hazards. These potential effects and related mitigation measure requirements are summarized in Table 3.16-3 and discussed below.

Table 3.16-3. Public Health and Environmental Hazards Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measures	With Mitigation
Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction	Significant	Environmental Commitment: Stormwater Pollution Prevention Plan	Less than significant
Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities	Significant	Environmental Commitment: Stormwater Pollution Prevention Plan PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures PH-MM-2: Employment of a Toxic Release Contingency Plan	Less than significant
Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site	Significant	PH-MM-3: Implementation of Construction Site Safety Measures PH-MM-4: Implementation of an Emergency Response Plan	Less than significant
Effect PH-4: Exposure of People or Structures to Increased Flood Risk	Beneficial	None required	Beneficial

Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction

Construction associated with Alternative 1 would involve hazardous materials, such as fuels and lubricants, from the operation of construction equipment and vehicles (e.g., excavators, compactors, haul trucks, and loaders). Fuels and lubricants have the potential to be released into the environment at construction sites and along haul routes, causing potential environmental and human exposure to these hazards. The implementation of a SWPPP would ensure that this effect would be less than significant. Refer to Chapter 2, *Alternatives,* (Section 2.4, *Environmental Commitments*) for a complete description of SWPPP measures. No mitigation is required.

Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities

Clearing and grading would likely be required to implement the proposed levee improvements. This ground disturbance may expose construction workers, the general public, or the environment to hazardous materials such as petroleum hydrocarbons, pesticides, herbicides, fertilizers, contaminated debris, or other hazardous contaminants that would otherwise remain buried in or near the levee. Implementation of a SWPPP would ensure that the risk of accidental exposures and releases into the environment would be minimal and that the effect would not be significant. If a release were to occur, the environmental commitment to prepare a SWPPP, Mitigation Measure PH-MM-1, and Mitigation Measure PH-MM-2 would be implemented to ensure that water quality would be returned to baseline conditions and that any threat to public health would be met with an effective response. Implementation of this environmental commitment and the mitigation measures will reduce this effect to a less-than-significant level.

While not a construction-related effect, slurry cutoffs walls implemented under the project could provide an incidental and indirect operational benefit of inhibiting groundwater contaminants from entering the Feather River.

Environmental Commitment: Stormwater Pollution Prevention Plan

Refer to Chapter 2, *Alternatives* (Section 2.4.12) for a detailed description of the SWPPP.

Mitigation Measure PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures

SBFCA will conduct Phase I Environmental Site Assessments and, if necessary, Phase II Environmental Site Assessments or other appropriate testing. If necessary, before construction activities begin, the assessment will include an analysis of soil or groundwater samples for the potential contamination sites that were not covered by previous investigations..

Recommendations in Phase I and Phase II Environmental Site Assessments to address any contamination that is found will be implemented before initiating ground-disturbing activities. In addition, SBFCA will implement the following measures before ground-disturbing or demolition activities begin, in order to reduce health hazards associated with potential exposure to hazardous substances.

- Prepare a site plan that identifies any necessary remediation activities appropriate for proposed land uses, including excavation and removal of contaminated soils, and redistribution of clean fill material on the project site. The plan will include measures that ensure the safe transport, use, and disposal of contaminated soil and building debris removed from the site, as well as any other hazardous materials. In the event that contaminated groundwater is encountered during site excavation activities, the contractor will report the contamination to the appropriate regulatory agencies, dewater the excavated area, and treat the contaminated groundwater to remove contaminants before discharge into the sanitary sewer system. The contractor will be required to comply with the plan and applicable Federal, state, and local laws.
- Retain licensed contractors to remove all underground storage tanks.
- Notify the appropriate Federal, state, and local agencies if evidence of previously undiscovered soil or groundwater contamination is encountered during construction activities. Any contaminated areas will be cleaned up in accordance with the recommendations of the Environmental Health Division for Sutter, Butte, and Yuba Counties, Central Valley RWQCB, California Department of Toxic Substances Control, or other appropriate Federal, state or local regulatory agencies.

Prepare a worker health and safety plan before the start of construction activities that identifies, at a minimum, all contaminants that could be encountered during construction activity; all appropriate worker, public health, and environmental protection equipment and procedures to be used during project activities; emergency response procedures; the most direct route to the nearest hospitals; and a site safety officer. The plan will describe actions to be taken should hazardous materials be encountered onsite, including protocols for handling hazardous materials and preventing their spread, and emergency procedures to be taken in the event of a spill.

Mitigation Measure PH-MM-2: Employment of a Toxic Release Contingency Plan

The construction contractor will coordinate with regional and local planning agencies to incorporate a toxic release contingency plan, pursuant to California Government Code Section 8574.16, which requires that regional and local planning agencies incorporate such a measure within their planning. Implementation of this plan will ensure the effective and efficient use of resources in the areas of traffic and crowd control; firefighting; hazardous materials response and cleanup; radio and communications control; and provision of medical emergency services.

Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site

Construction associated with Alternative 1 would involve operation of vehicles and other mechanical equipment by construction workers that, if used improperly, could result in safety hazards at the construction site to workers and the public (e.g., pedestrians, bicyclists). Also, the staging of the equipment during hours of non-operation (e.g., weekends, holidays, and overnight) may pose a threat to public safety if the equipment is not properly secured. Implementation of Mitigation Measures PH-MM-3 and PH-MM-4 would reduce this effect to a less-than-significant level.

Mitigation Measure PH-MM-3: Implementation of Construction Site Safety Measures

The construction contractor will ensure that all workers are properly trained to operate equipment. Safety precautions will be followed at all times during construction to avoid accidents. The construction contractor will also require that all workers have valid drivers' licenses and insurance. Proper signage and detours will be provided to ensure public safety.

Mitigation Measure PH-MM-4: Implementation of an Emergency Response Plan

Development of an emergency response plan will ensure that any accidents that occur at the construction site will be responded to in the appropriate manner. The construction contractor will develop the emergency response plan, taking into consideration the location of nearby emergency response agencies as well as emergency response access routes and response times.

Effect PH-4: Exposure of People or Structures to Increased Flood Risk

All levees have the potential to fail, regardless of design. USACE has set forth guidelines for levee design. Alternative 1 would result in improved levees in the project area through implementation of levee improvement methods that meet engineering requirements set forth by both USACE and the CVFPB. This would be an improvement compared to existing ~~flood protection~~level of performance. Therefore, this effect would be beneficial. No mitigation is necessary.

3.16.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on public health and environmental hazards. These potential effects and related mitigation measure requirements are summarized in Table 3.16-4 and discussed below.

Table 3.16-4. Public Health and Environmental Hazards Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measures	With Mitigation
Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction	Significant	Environmental Commitment: Stormwater Pollution Prevention Plan	Less than significant
Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities	Significant	Environmental Commitment: Stormwater Pollution Prevention Plan PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures PH-MM-2: Employment of a Toxic Release Contingency Plan	Less than significant
Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site	Significant	PH-MM-3: Implementation of Construction Site Safety Measures PH-MM-4: Implementation of an Emergency Response Plan	Less than significant
Effect PH-4: Exposure of People or Structures to Increased Flood Risk	Beneficial	None required	Beneficial

Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction

Construction associated with Alternative 2 would involve hazardous materials, such as fuels and lubricants, from the operation of construction equipment and vehicles (e.g., excavators, compactors, haul trucks, and loaders). Fuels and lubricants have the potential to be released into the environment at construction sites and along haul routes, causing potential environmental and human exposure to these hazards. The implementation of a SWPPP would ensure that this effect would be less than significant. Refer to Chapter 2, *Alternative*s, (Section 2.4, *Environmental Commitments*). No mitigation is required.

Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities

Clearing and grading would likely be required to implement the proposed levee improvements. This ground disturbance may expose construction workers, the general public, or the environment to hazardous materials such as petroleum hydrocarbons, pesticides, herbicides, fertilizers, contaminated debris, or other hazardous contaminants that would otherwise remain buried in or near the levee. Implementation of a SWPPP would ensure that the risk of accidental exposures and releases into the environment would be minimal and that the effect would not be significant. If a release were to occur, the environmental commitment to prepare a SWPPP, Mitigation Measure PH-MM-1, and Mitigation Measure PH-MM-2 would be implemented to ensure that water quality would be returned to baseline conditions and that any threat to public health would be met with an effective response. Implementation of this environmental commitment and the mitigation measures will reduce this effect to a less-than-significant level.

While not a construction-related effect, slurry cutoffs walls implemented under the project could provide an incidental and indirect operational benefit of inhibiting groundwater contaminants from entering the Feather River.

Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site

Construction associated with Alternative 2 would involve operation of vehicles and other mechanical equipment by construction workers that, if used improperly, could result in safety hazards at the construction site to workers and the public (e.g., pedestrians, bicyclists). Also, the staging of the equipment during hours of non-operation (e.g., weekends, holidays, and overnight) may pose a threat to public safety if the equipment is not properly secured. Implementation of Mitigation Measures PH-MM-3 and PH-MM-4, as described in the discussion of Alternative 1, would reduce this effect to a less-than-significant level.

Effect PH-4: Exposure of People or Structures to Increased Flood Risk

All levees have the potential to fail, regardless of design. USACE has set forth guidelines for levee design. Alternative 2 would result in improved levees in the project area through implementation of levee improvement methods that meet engineering requirements set forth by both USACE and the CVFPB. This would be an improvement compared to the existing ~~flood protection~~level of performance. Therefore, this effect would be beneficial. No mitigation is necessary.

3.16.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on public health and environmental hazards. These potential effects and related mitigation measure requirements are summarized in Table 3.16-5 and discussed below.

Table 3.16-5. Public Health and Environmental Hazards Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measures	With Mitigation
Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction	Significant	Environmental Commitment: Stormwater Pollution Prevention Plan	Less than significant
Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities	Significant	Environmental Commitment: Stormwater Pollution Prevention Plan PH-MM-1: Complete Phase I and Phase II (if Necessary) Environmental Site Assessment Investigations and Implement Required Measures PH-MM-2: Employment of a Toxic Release Contingency Plan	Less than Significant
Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site	Significant	PH-MM-3: Implementation of Construction Site Safety Measures PH-MM-4: Implementation of an Emergency Response Plan	Less than Significant
Effect PH-4: Exposure of People or Structures to Increased Flood Risk	Beneficial	None required	Beneficial

Effect PH-1: Temporary Exposure to or Release of Hazardous Materials during Construction

Construction associated with Alternative 3 would involve hazardous materials, such as fuels and lubricants, from the operation of construction equipment and vehicles (e.g., excavators, compactors, haul trucks, and loaders). Fuels and lubricants have the potential to be released into the environment at construction sites and along haul routes, causing potential environmental and human exposure to these hazards. The implementation of a SWPPP would ensure that this effect would be less than significant. Refer to Chapter 2, *Alternatives,* (Section 2.4, *Environmental Commitments*). No mitigation is required.

Effect PH-2: Exposure of the Environment to Hazardous Materials during Ground-Disturbing Activities

Clearing and grading would likely be required to implement the proposed levee improvements. This ground disturbance may expose construction workers, the general public, or the environment to hazardous materials such as petroleum hydrocarbons, pesticides, herbicides, fertilizers, contaminated debris, or other hazardous contaminants that would otherwise remain buried in or near the levee. Implementation of a SWPPP would ensure that the risk of accidental exposures and releases into the environment would be minimal and that the effect would not be significant. If a release were to occur, the environmental commitment to prepare a SWPPP, Mitigation Measure PH-MM-1, and Mitigation Measure PH-MM-2 would be implemented to ensure that water quality would be returned to baseline conditions and that any threat to public health would be met with an effective response. Implementation of this environmental commitment and the mitigation measures will reduce this effect to a less-than-significant level.

While not a construction-related effect, slurry cutoffs walls implemented under the project could provide an incidental and indirect operational benefit of inhibiting groundwater contaminants from entering the Feather River.

Effect PH-3: Temporary Exposure to Safety Hazards from the Construction Site

Construction associated with Alternative 3 would involve operation of vehicles and other mechanical equipment by construction workers that, if used improperly, could result in safety hazards at the construction site to workers and the public (e.g., pedestrians, bicyclists). Also, the staging of the equipment during hours of non-operation (e.g., weekends, holidays, and overnight) may pose a threat to public safety if the equipment is not properly secured. Implementation of Mitigation Measures PH-MM-3, and PH-MM-4, described in the discussion of Alternative 1, would reduce this effect to a less-than-significant level.

Effect PH-4: Exposure of People or Structures to Increased Flood Risk

All levees have the potential to fail, regardless of design. USACE has set forth guidelines for levee design. Alternative 3 would result in improved levees in the project area through implementation of levee improvement methods that meet engineering requirements set forth by both USACE and the CVFPB. This would be an improvement compared to the existing ~~flood protection~~level of performance. Therefore, this effect would be beneficial. No mitigation is necessary.

3.17 Cultural Resources

3.17.1 Introduction

This section describes the regulatory and environmental setting for cultural resources; effects on cultural resources that would result from the No Action Alternative and Alternatives 1, 2, and 3; and mitigation measures that would reduce significant effects on cultural resources. This chapter focuses primarily on flood risk reduction measures, however ancillary facilities such as PG&E facilities may also be affected by the project. Once the precise locations of PG&E's facilities are known, all areas of proposed ground disturbance will be screened to determine if they fall within the areas previously surveyed for the presence of cultural resources in support of the EIR/EIS. In the event that there are areas proposed for ground disturbance that fall outside of the EIR/EIS cultural survey area, a site-specific environmental review will be required to ensure that impacts to cultural resources are avoided. The review should consist of one or more of the following: literature review, records search and pedestrian survey. The precise method of review for each facility relocation will be decided in consultation with a PG&E Cultural Resources Specialist.

~~For the purposes of this section, cultural resources consist of historic and prehistoric archaeological sites, traditional cultural properties, and built environment resources.~~This chapter describes the potential for each of the alternatives to result in significant effects on historic properties. Historic properties consist of cultural resources listed on or eligible for listing in the National Register of Historic Places (NRHP) (36 CFR § 800.16[l][1]). Cultural resources are eligible for the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association (further discussed below in Section 18.2.2.1) and:

- are associated with events that have made a significant contribution to the broad patterns of our history; or
- are associated with the lives of persons significant in our past; or
- embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Historic properties include but are not limited to archaeological resources, traditional cultural properties, and built environment resources.

Archaeological resources consist of the physical remains of past human activity, when such remains have been preserved in the ground but no longer take the form of a standing structure such as a house or building. Archaeological remains may occur in the same place as standing structures but are considered a distinct element (called a *component*) of the larger resource.

Traditional cultural properties consist of resources that are associated with the practices or beliefs of a living community and are (a) rooted in that community's history for at least 50 years and (b) important in maintaining the continuing cultural identity of the community (Parker and King 1998:1).

Built environment resources consist of standing structures, residences, and engineered works such as levees, bridges, ditches, and pumping plants. Where these resources form a landscape unified by a coherent historical or design theme, they may qualify as a rural historic landscape (U.S. Department of the Interior 1999:1). Typically, built environment resources must also be older than 50 years to qualify as cultural resources.

3.17.2 Affected Environment

The following summary describes the regulatory and environmental setting that is relevant to the analysis of effects on cultural resources.

3.17.2.1 Regulatory Setting

This section summarizes key Federal ~~and state~~ regulatory information that applies to cultural resources. Additional regulatory information appears in Appendix A.

Federal

National Environmental Policy Act

NEPA establishes the Federal policy of protecting important historic, cultural, and natural aspects of our national heritage during Federal project planning. All Federal or federally assisted projects requiring action pursuant to Section 102 of NEPA must take into account the effects on cultural resources (42 USC §4321–4347).

The CEQ Guidelines provide a standard for determining the significance of effects analyzed under NEPA. *Significance* as used in NEPA requires considering effects in terms of both context and intensity (40 CFR §1508.27).

- *Context* means that the action—in this analysis, *project*—must be analyzed in terms of society as a whole, the affected region and interests, and the local setting. The span of the context should be scaled to match the project. For larger projects, a wider context is appropriate. For smaller site-specific projects, the local context may be sufficient. Both the short- and long-term effects of a project are relevant to this analysis (40 CFR §1508.27[a]).
- *Intensity* means the severity of an effect. The CEQ Guidelines direct Federal agencies to consider cultural resources when evaluating intensity. Specific factors that may affect the intensity of an effect include the proximity to historical or cultural resources, the potential for effects on properties that are or may be eligible for listing in the ~~National Register of Historic Places (~~NRHP~~)~~, and the potential for loss or destruction of significant scientific, cultural, or historical resources (40 CFR §1508.27[b]).

Collectively, these considerations mean that NEPA analysis should identify the potential for a project to adversely (i.e., significantly) affect resources that are or may be eligible for listing on the NRHP.

Section 106 of the National Historic Preservation Act of 1966

The FRWLP requires permits to discharge fill to waters of the United States under Section 404 of the Clean Water Act (33 USC §1344) and authorization to modify federally regulated levees under Section 14 of the Rivers and Harbors Act (33 USC §408). Because these Federal permissions may result in effects on *historic properties*, or cultural resources listed on or eligible for listing in the

NRHP (36 CFR Part 800.16[l][1]), they are undertakings that require compliance with Section 106 of the National Historic Preservation Act (NHPA) (16 USC §470f) (Section 106). Section 106 requires Federal agencies to consider the effects of their actions on historic properties.

The proposed FRWLP is a large, phased construction project. The Section 106 regulations specifically authorize phased management of cultural resources where the project area covers a large area or access is restricted (36 CFR Part 800.4[b][2]). This section of the regulations allows the agency to provide for a phased management process in a programmatic agreement (PA) or memorandum of agreement. USACE is working with SBFCA to develop a ~~programmatic agreement~~PA that provides for a phased review process for Section 106. Under the draft PA, SBFCA will work with USACE to perform management activities required under Section 106 for discrete phases of the project according to the proposed construction schedule. For each discrete phase, SBFCA and USACE will complete the following steps.

- Prepare a map of the area of potential effects (APE) for the phase in consultation with the State Historic Preservation Officer (SHPO).
- Complete an inventory of the APE.
- Evaluate all cultural resources in the APE for eligibility for listing in the NRHP.
- Prepare a finding of effect for each resource.
- Resolve significant effects through treatment or avoidance.

The management activities prescribed in the ~~Programmatic Agreement (~~PA~~)~~ will be conducted in consultation with SHPO, the Native American community, and any other party that constitutes a stakeholder in the management of cultural resources for the project.

Appendix J contains the draft PA and supporting figures. Figure 2 in this appendix depicts the entire FRWLP APE. Within this area, as required by USACE, SBFCA will conduct an inventory of the architectural (built environment) and archaeological APE. The architectural APE consists of all properties within 200 linear feet of the project footprint. The archaeological APE will consist of the area of direct impact within the project footprint.

Preparation of the Programmatic Agreement

The USACE, SBFCA, and the SHPO developed the PA in collaboration, and consulted with Native American Tribes. In particular, the United Auburn Indian Community, the Enterprise Rancheria Estom Yumeka Maidu Tribe provided comments or information. Additionally, the USACE offered the opportunity to participate in the consultation to the Mechoopda Indian Tribe of the Chico Rancheria, The Greenville Rancheria of Maidu Indians, the Maidu Nation, the Mooretown Rancheria of Maidu Indians, the KonKow Valley Band of Maidu, the Maidu Cultural and Development Group, the T'Si-Akim Maidu, the Strawberry Valley Rancheria, and individuals identified by the NAHC.

The Advisory Council on Historic Preservation (ACHP) was offered the opportunity to consult on the document, but declined in a letter dated July 18, 2012 (Appendix K).

The signatory parties determined that the PA is the appropriate approach to Section 106 compliance for the FRWLP project for two reasons. First, because the larger project would be implemented following a phased process; it would be most effective to consider effects on historic properties for each phase individually, as plans and designs are refined. A project-wide approach would be overly broad and would not allow USACE to consider all the resources at the appropriate detail required

under the NHPA and Section 106 regulations. Second, while the project will be constructed in phases, the project has the potential to impact certain very large linear features such as the levee itself. Because the PA provides a mechanism for considering both impacts of each project phase and larger project-wide effects, the PA is the appropriate vehicle for satisfying Section 106 of the NHPA.

The substance of the PA was developed primarily through conversations and iterative review of the document between USACE and SHPO staff with the assistance of ICF, the contractor working for SBFCA. USACE first provided a general template based upon the substantive stipulations used for similar project. The contents of the PA were then refined through a series of iterative drafts, written by ICF and reviewed and refined by USACE and SHPO staff.

The PA requires consultation with Native American Tribes during implementation of the management provisions, to ensure that Native American Tribes may participate in the management process and provide their preferences for management of historic properties. No substantial comments on the text of the agreement were received from any of the Tribes contacted by the USACE. United Auburn Indian Community and Enterprise Rancheria Estom Yumeka Maidu Tribe have expressed interest in joining the agreement as concurring parties. These tribes, and all the others listed above, will be involved in on-going consultation throughout project implementation.

The signatory parties agreed upon the final draft of the PA; the PA is in the process of being signed.

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) defines the ownership of Native American human remains and funerary materials excavated on lands owned or controlled by the Federal government. NAGPRA is applicable because the FRWLP may traverse Federal lands.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (ARPA) requires a permit for intentional excavation of archaeological materials on Federal lands (16 USC 470ee[a]). ARPA is applicable because the FRWLP may traverse Federal lands. The Federal agency that owns or controls the land may dispense permits for excavation as provided in the ARPA regulations (43 CFR §7.5). The permit may require notice to affected Indian tribes (43 CFR §7.7) and compliance with the terms and conditions provided in the ARPA regulations (43 CFR §7.9).

~~State~~

~~California Environmental Quality Act—Statute and Guidelines~~

~~CEQA requires the lead agency to consider the effects of a project on cultural resources. Two categories of cultural resources are specifically called out in the State CEQA Guidelines: *historical resources* (State CEQA Guidelines §15064.5[b]) and *unique archaeological sites* (State CEQA Guidelines §15064.5[c] and PRC §21083.2). Different legal rules apply to the two different categories of cultural resources, although the two categories sometimes overlap where a unique archaeological resource also qualifies as a historical resource. In such an instance, the more stringent rules for archaeological resources that are historical resources apply. Appendix A provides additional background on CEQA as it pertains to cultural resources; it also provides information on other California laws that set forth special rules for dealing with human remains that might be encountered during construction.~~

~~**Local**~~

~~Butte County, Sutter County, and the City of Yuba City each have adopted goals and policies related to cultural resources. These are detailed in Appendix A.~~

3.17.2.2 Environmental Setting

The prehistoric, ethnographic, and historic contexts for the FRWLP are described in Appendix I. These contexts provide an overview of the significance themes relevant to the analysis of effects on cultural resources.

3.17.3 Environmental Consequences

This section describes the environmental consequences relating to cultural resources for the proposed project. The section first provides an overview of the methods used to determine the effects of the proposed project and the thresholds used to conclude whether an effect would be significant. Descriptions of specific effects and mitigation measures follow.

3.17.3.1 Assessment Methods

This section summarizes the sources of information used to identify known (i.e., previously recorded) cultural resources as well as the potential for additional cultural resources to be identified in the project area. This section also describes the specific mechanisms for effects on cultural resources associated with the FRWLP. Together, data on the kinds of resources that occur in the footprint of the project alternatives and the effect mechanisms of these alternatives were used to describe the potential effects of the alternatives under consideration.

Data Sources

Records Search

Data sources for this effects analysis include a records search, query of the shipwreck database maintained by the California State Lands Commission (CSLC), Native American correspondence, and the environmental setting provided in Appendix I.

On June 22, 2011, ICF conducted a records search at the Northeastern Information Center (NEIC) of the California Historical Information System (CHRIS) at Chico State University in Chico, California. The NEIC maintains the State of California's official records of previous cultural resources studies and recorded cultural resources for Butte and Sutter Counties. The records search consulted the CHRIS base maps of previously recorded cultural resources for the project area, encompassing the levee and a 500-meter buffer around the approximate project footprint, including the land and water sides of the levee. Additional sources of information, including previously conducted cultural resources surveys and historical maps (~~U.S. Geological Survey [~~USGS~~]~~ and General Land Office [GLO]), were selectively reviewed to determine areas that have a high potential for the presence of historical and prehistoric sites. An ICF archaeologist also reviewed the following registers and lists.

- NRHP and California Register of Historical Resources (CRHR).
- California Office of Historic Preservation Historic Property Directory (2010).
- California Inventory of Historic Resources (1976).

- California State Historic Landmarks (1996).
- California Points of Historical Interest (1992).

A total of 256 previously recorded cultural resources were identified within the project area that may be subject to effects and also have the potential to qualify as ~~historical resources or~~ historic properties. Of these, 17 consist of built environment resources and 89 are archaeological resources. These resources include resources that were identified through the record search as well as field inventory and historical research.

~~Projects that affect cultural resources that have not been evaluated or determined eligible for the NRHP or CRHR may still result in significant effects, where facts indicate the affected resources are likely to possess significance and integrity within the meaning of CEQA or the NRHP. For example, the California PRC provides that a lead agency may determine that a cultural resource likely qualifies as a historical resource when analyzing the significant effects of a project, even if the resource has not been determined eligible or evaluated per the significance criteria provided in the State CEQA Guidelines (PRC §21084.1). This section must be read in the context of the general requirement that all of the lead agency's conclusions must be supported by fact and inferences supported by fact (State CEQA Guidelines §15384). Section 21084.1 thus indicates that a lead agency should conservatively estimate whether or not affected cultural resources are likely to qualify as historical resources, even if technical work evaluating such resources has not been completed. Such evaluations should be supported by fact, but need not contain the same level of detail that can be provided in focused cultural resources surveys and evaluations.~~

The basis for the conclusion that potentially affected resources may be historic properties ~~or historical resources~~ is provided in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Completion of evaluation reports and associated technical work in coordination with SHPO is necessary to confirm these preliminary recommendations.

The records search indicated that 16 cultural resources surveys have been conducted within the records search corridor. These surveys have collectively covered approximately 25% of the records search area. Of the 16 studies, 7 were conducted more than 10 years ago. The majority of the surveys focused on the levee and its immediate vicinity (Appendix I, Table I-2).

Shipwreck Database

ICF also completed a query of the CSLC shipwreck database. The query results indicated that a historic-era shipwreck is located in the Feather River just west of Nicolaus and north of SR 99. The shipwreck is recorded as a steamship named *RK Page* that sunk in 1853 after a boiler explosion. It is not anticipated the project will affect this resource because most work is constrained to the levee and the landside and waterside areas in the immediate vicinity. It should be noted that title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the California State Lands Commission.

Contact with Interested Parties

ICF sent a letter to the Native American Heritage Commission (NAHC) on February 23, 2012. In this letter, ICF requested that the NAHC perform a query of the Sacred Lands File (a database of features important to Native Americans) and provide a list of Native American contacts for Sutter and Butte Counties. The NAHC responded by letter on March 22, 2012, indicating that the NAHC did not

identify any resources in the database that occur within the project area. The NAHC also responded with a list of Native American individuals and organizations that may have concerns or information regarding cultural resources that may occur in the project area. As part of the consultation conducted under Section 106, USACE contacted Native American individuals and organizations. ICF, in cooperation with USACE, is participating in active consultation with Native American representatives to identify known cultural resources and areas of sensitivity for unknown cultural resources that may be affected by the project. As described in Appendix I, ICF contacted all parties identified in the NAHC list by letter on September 28, 2012. ~~Both the~~The Enterprise Rancheria~~, and the~~ Mooretown Rancheria, and United Auburn Indian Community responded by letter and requested the opportunity to review cultural resources finds and technical documents. The United Auburn Indian Community has provided information regarding archaeological sites that may be affected by the alternatives.

Contextual Information

The environmental setting included in Appendix I provides an overview of the prehistoric, ethnographic, and historic activities that generate cultural resources. These literature sources demonstrate intense human activity in the region for the past 10,000 years. Because these human activities generate physical remains such as prehistoric sites and historic structures and residences, the project area for the FRWLP is sensitive for additional cultural resources that have not been identified.

Field Methods (Survey)

ICF cultural resources staff conducted a pedestrian survey of the project area during spring and summer 2012. During the pedestrian survey, ICF visited previously identified resources and recorded previously unidentified resources. For identified resources, ICF either confirmed the boundaries and description of identified resources or gathered data to support updates to the site record. For previously unidentified resources, ICF recorded the boundaries and nature of the resource and collected data to support preparation of site or resource records using California Department of Parks and Recreation (DPR) forms. NRHP e~~E~~valuations of affected resources are in progress.

As required by USACE, SBFCA will conduct subsurface excavation to identify buried sites within areas that are sensitive for buried resources that occur with little or no surface manifestation.

Environmental Impact Report for the Feather River West Levee Project

This EIS was initiated as a joint document with USACE involvement pursuant to its authority under 33 USC Section 408 and as the lead NEPA agency, and with SBFCA as the project applicant and CEQA lead agency. The Draft EIS/EIR was written with joint NEPA and CEQA language to characterize the cooperation of the two agencies on the FRWLP. Since the release of the Draft EIS/EIR, the NEPA and CEQA processes have been separated and the joint EIS/EIR is now represented as a stand-alone EIS and a stand-alone EIR. It should be noted that the language in this EIS has not been modified to NEPA-only; it maintains the joint language used when environmental analysis was initiated on the FRWLP for the purposes of significance conclusions (impacts that would be "significant" under NEPA are reported as "significant and unavoidable," a term that is used under CEQA).

SBFCA identified CRHR-eligible resources and described potentially significant and unavoidable effects on these resources for the purposes of CEQA in a separate final environmental impact report.

Because USACE must disclose the potential for effects that are significant under NEPA, the effects and mitigation measures below describe the conclusions of USACE for the purposes of NEPA. Where effects are significant under NEPA they are reported as "significant and unavoidable."

Test Excavation and Evaluation

Evaluation of identified resources is in progress using standard methods. For archaeological resources, test excavation may be used to identify archaeological resource boundaries and assess resource integrity to determine if the resource has data potential. For built environment resources, recordation and assessment per relevant significance themes are used to determine the integrity and significance of the resource.

Effect Mechanisms

FRWLP-related activities may affect cultural resources directly or indirectly. Direct effects on cultural resources may occur through any of the following actions.

- Ground-disturbing construction that damages historic or prehistoric archaeological sites and impairs the constituent deposits in the sites and their utility for answering archaeological research questions.
- Ground-disturbing construction that unearths and damages human remains.
- Direct demolition of built environment resources such as historic-era residences, structures, or buildings.
- Direct excavation or alteration of traditional cultural properties.
- Direct effects on individual resources that create significant effects on rural historic landscapes, where the individual resource is a constituent element of the rural historic landscape.

Indirect effects may occur under any of the following actions.

- Construction in the vicinity of a resource removes features of the surrounding setting, where the setting is an integral part of the resource.
- Construction in the vicinity introduces new physical features that are incongruent with the setting, where the setting is an integral part of the resource.
- Introduction of new sources of sound or activities in the vicinity that would be inconsistent with the setting, where the setting is an integral part of the resource.
- Increasing public access or traffic near a resource, where increased access or traffic would result in looting or inadvertent damage.
- Vibration associated with construction, where vibration may damage the integrity of a resource such as a residence or structure that is susceptible to vibration damage.

3.17.3.2 Determination of Effects

Effects on cultural resources are considered significant under NEPA if the FRWLP would ~~result in any of the following:, under the respective laws that govern the FRWLP.~~

~~Under CEQA, an effect is significant if it would demolish or materially alter the qualities that justify the resource for inclusion or eligibility for inclusion on the CRHR (State CEQA Guidelines §15064.5[b][2][A],[C]).~~

~~Under CEQA, an effect is also significant if it would demolish or materially alter the qualities that justify the inclusion of the resource on a local register (State CEQA Guidelines §15064.5[b][2][B]) or its identification as a historical resource survey meeting the requirements of PRC §5024.1(g).~~

~~CEQA also covers effects on unique archaeological sites. Effects on unique archaeological sites are significant if they would demolish or materially impair the characteristics that allow a site to qualify as a unique archaeological resource (PRC §21083.2[g]).~~

~~CEQA protects interred human remains. Under CEQA, an effect is significant if it would disturb human remains, including remains interred outside of established cemeteries (State CEQA Guidelines, Appendix G checklist).~~

~~Under Section 106, effects are significant if they would~~ alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5[a][1]). Significant effects under Section 106 only include effects on resources that are NRHP-eligible or NRHP-listed; effects on resources considered significant under state law are not significant effects under Section 106 if those resources do not qualify for listing in the NRHP.

Under the PA (Appendix J), USACE will resolve adverse effects for the purposes of Section 106 of the NHPA.

Section 106 does not define a precise set of actions that resolve effects, nor do the Section 106 regulations. Instead, federal agencies are directed to develop feasible measures that would "avoid, minimize or mitigate adverse effects" (36 CFR § 800.6[a]). Avoidance typically means redesigning a project so that a federal undertaking will not disturb a resource. Minimizing typically means redesigning or conditioning an undertaking so that effects are reduced but not entirely avoided. Mitigation typically means taking actions to compensate for an effect, without avoiding the effect. For example, data recovery excavations that recover important information would be considered mitigation because the data recovery by itself does not change the effect of the larger project on the resource. Data recovery instead offsets information that would otherwise be lost.

NEPA defines mitigation to include avoidance, minimization, rectifying, reducing, or compensating for an impact (40 CFR Part 1508.20). Accordingly, all management actions necessary to identify historic properties that may be adversely affected and manage those effects are described as mitigation below. Because all effects will be resolved, but resolution does not guarantee that effects will be avoided, effects are described as significant.

~~3.17.3.3 Distinguishing Effects on Cultural Resources under CEQA and NEPA~~

~~It should be noted that while the NRHP emphasizes resources that are significant at a national level, and resources protected under state law are more inclusive of state or local significance themes, there is substantial overlap between the two. For example, National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation, indicates that the NRHP may include properties that are significant at both the state and local levels (U.S. Department of the Interior 1990:i). The~~

~~California Office of Historic Preservation mirrors the emphasis that NRHP-eligible resources may be significant at the local level (California Office of Historic Preservation 2012:2).~~

~~Resources that are significant at a national level are also eligible as historical resources under CEQA (California Office of Historic Preservation 2012:1). However, in some instances, resources may qualify as historical resources under CEQA that are not eligible for the NRHP. For example, the State CEQA Guidelines indicate that historical resources for the purposes of CEQA analysis will include resources listed on local registers (14 CCR Section 15064.5[a][2]). While historical resources that meet the significance criteria under CRHR regulations (CCR Sections 4851 and 4852) are typically also eligible for the NRHP, resources that only achieve significance under local registers may qualify as historical resources under CEQA without qualifying as historic properties. For this latter category of resources, significant effects would contribute to a significant effect under CEQA without resulting in a significant effect under NEPA or Section 106.~~

3.17.4 Effects and Mitigation Measures

Effects and mitigation measure requirements concerning cultural resources are summarized in Table 3.17-1.

Table 3.17-1. Summary of Effects for Cultural Resources

Effect	Finding	Mitigation Measures	With Mitigation
Alternatives 1, 2, and 3			
Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities	Significant	CR-MM-1: Perform Field Studies, Evaluate Identified Resources and Determine Effects, and Develop Treatment to Resolve Significant Effects	Significant and unavoidable
Effect CR-2: Potential to Disturb Unidentified Archaeological Sites	Significant	CR-MM-2: Implement a Cultural Resources Discovery Plan, Provide Related Training to Construction Workers, and Conduct Construction Monitoring	Significant and unavoidable
Effect CR-3: Potential to Disturb Human Remains	Significant	CR-MM-3: Monitor Culturally Sensitive Areas during Construction and Follow State and Federal Laws Governing Human Remains if Such Resources Are Discovered	Significant and unavoidable
Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities	Significant	CR-MM-4: Conduct Inventory of Built Environment Resources, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects	Significant and unavoidable

3.17.4.1 No Action Alternative

Under the No Action Alternative, no levee improvements would be made to increase the level of protection, and it is presumed that no ground-disturbing activities associated with levee repair and alternatives would occur. Because no levee improvements would be made under the No Action Alternative, the risk that the Feather River West Levee could fail due to seepage or slope stability/geometry issues would continue. Failure of the Feather River West Levee, depending on the magnitude of the event, could cause catastrophic flooding in the Sutter Basin. If this levee failed,

inundation of debris and mud from that failure could significantly damage or completely destroy any resource in its path. Furthermore, emergency efforts to contain and repair a failed levee could potentially cause the same effects described for the proposed alternatives—and possibly with greater significance. Although the levee would be damaged, the potential extent of damage to the resource is unknown. It is also unknown whether these events would transpire and affect other cultural resources; therefore, further analysis of effects on cultural resources would be speculative. Federal agencies responsible for levee repairs would be responsible for compliance with Section 106, and local governments would be responsible for carrying out Federal programs. Local agencies participating or implementing repairs would be responsible for compliance with CEQA.

3.17.4.2 Alternative 1

Implementation of Alternative 1 would potentially result in effects on cultural resources. These potential effects and related mitigation measure requirements are summarized in Table 3.17-2 and discussed below.

Table 3.17-2. Cultural Resources Effects and Mitigation Measures for Alternative 1

Effect	Finding	Mitigation Measures	With Mitigation
Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities	Significant	CR-MM-1: Perform Field Studies, Evaluate Identified Resources and Determine Effects, and Develop Treatment to Resolve Significant Effects	Significant and unavoidable
Effect CR-2: Potential to Disturb Unidentified Archaeological Sites	Significant	CR-MM-2: Implement a Cultural Resources Discovery Plan, Provide Related Training to Construction Workers, and Conduct Construction Monitoring	Significant and unavoidable
Effect CR-3: Potential to Disturb Human Remains	Significant	CR-MM-3: Monitor Culturally Sensitive Areas during Construction and Follow State and Federal Laws Governing Human Remains if Such Resources Are Discovered	Significant and unavoidable
Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities	Significant	CR-MM-4: Conduct Inventory of Built Environment Resources, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects	Significant and unavoidable

Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities

A range of archaeological resources have been identified that may be affected by this alternative (~~nine resources as indicated in~~ Appendix I, Table I-4). Identified prehistoric resources contain midden (habitation debris), human burials, hearths (charred remains from cooking), and lithic debris (remains from manufacture of stone tools). Deposits with these constituents often have data potential for archaeological research, which strives to describe human adaptations and their changes over time and to construct meaningful explanations for these changes. Because material in these sites may be useful for this purpose, it is likely that many of these sites have significance within the meaning of the NRHP~~14 CCR §4852(b)(4) (data potential)~~. Furthermore, because many of these resources are expansive (each in excess of 30 meters across), they are each likely to contain

some portion of the deposit with sufficient integrity to yield meaningful data ~~(14 CCR §4852[c])~~. Additional research value may be associated with specific deposits that cannot be identified in advance. ~~For these same reasons, t~~These sites are therefore likely to be eligible for inclusion in the NRHP because they may yield information pertinent to prehistoric archaeological research (30 CFR Part 60.4[d]). These sites thus are likely to qualify as historic ~~historical resources and historic~~ properties. Identified resources may be significant under other NRHP eligibility criteria. Individual sites and their potential register eligibility are described in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Potential resource-specific treatments are identified in Appendix I, Table I-4.

Identified historic-era archaeological sites are associated with the themes of mining, transportation, and settlement. These themes are significant because they are associated with the historic-era economy and development of the region. For these reasons, it is likely that many of these sites have significance within the meaning of the NRHP~~14 CCR §4852(b)(1) (association with the broad patterns of history)~~. In addition, because these sites contain physical remnants of the activities associated with these themes, they may be able to elucidate significant details regarding the settlement of the region and expansion of Euro-American populations into the Sacramento Valley. For this reason, these sites may have data potential within the meaning of the NRHP~~14 CCR §4852(b)(4)~~. While these sites have not been revisited to assess their integrity, these resources are expansive (e.g., CA-BUT-465/CA-BUT-1345 is described as a landscape feature spanning several miles) and it is likely that some portion of the deposits remain with sufficient integrity to yield useful data~~data (14 CCR §4852[c])~~. For these same reasons, these sites are likely to have significance and integrity for the NRHP as defined in 30 CFR §60.4, because these sites may yield information in historic research regarding the theme of settlement and resource extraction in California, a theme that is significant at the local, state, and national levels (30 CFR §60.4[a]). The NRHP may include resources that are significant at the state, local, and national levels (U.S. Department of the Interior 1990:i). These sites thus are likely to qualify as ~~historical resources and~~ historic properties.

In addition to sites that have currently been identified, SBFCA is conducting sampling under direction from USACE in order to identify buried and obscured sites in advance of construction where feasible. Sites that may be identified through these efforts have the potential to qualify as historic properties.

Construction of levee improvements and ancillary activities such as borrow operations have the potential to directly disturb identified resources (including sites that may be located through sampling) through ground-disturbing excavation or by placement of large, durable new features such as seepage berms or stability berms over these resources. Because direct disturbance through excavation would disrupt the associations that contain meaningful information~~, it would potentially materially impair these resources under CEQA (State CEQA Guidelines §15064.5[b][2][A],[C]). For the same reasons~~, this work could result in significant effects under Section 106 (36 CFR Part 800.5[a][1]). Mitigation Measure CR-MM-1 is available to reduce these effects. In addition, this mitigation addresses management steps necessary under Section 106 to resolve significant effects by attempting to avoid or minimize those effects or to recover consequential information where avoidance is not feasible. Because ~~mitigation~~ feasible management steps cannot guarantee that all effects would be avoided (even where such effects would be resolved under Section 106), these effects would remain significant and unavoidable~~and unavoidable for the purposes of CEQA~~.

Mitigation Measure CR-MM-1: Perform Field Studies, Evaluate Identified Resources and Determine Effects, and Develop Treatment to Resolve Significant Effects

~~Prior to the completion of the final environmental impact statement/final environmental impact report (FEIS/FEIR), SBFCA and~~ USACE and SBFCA will complete the following mitigation and management steps to satisfy Section 106. USACE is responsible for completing management steps necessary to comply with NEPA and Section 106 of the NHPA; SBFCA will provide technical work in support of this compliance, subject to the review and authority of USACE and SHPO. Appendix J contains the PA which provides a detailed description of how relevant management steps will be performed. ~~(subject to revision based on coordination with SBFCA counsel).~~

- ~~SBFCA and~~ USACE will ensure that an inventory and evaluation report for cultural resources is completed within all areas of the right-of-way where effects on archaeological resources may occur. SBFCA will support USACE by performing technical work required under the PA, however evaluations are subject to USACE and SHPO review.
- The work will be led or supervised by cultural resources specialists who meet the Secretary of the Interior's professional qualification standards provided in 36 CFR Part 61.
- Inventory methods will include pedestrian surveys and probabilistic subsurface sampling through appropriate subsurface excavation methods.~~excavation with augurs or hand excavating units where feasible.~~
- Identified resources and newly identified resources will be mapped and described on DPR forms. Mapping will be performed by recording data points with GPS hardware through which data can be imported and managed digitally. Mapping of previously identified resources will be limited to updates of existing records where necessary to describe the current boundaries of the resource.
- For all identified resources, ~~SBFCA and~~ USACE will perform an evaluation to determine if they qualify as historic properties per the criteria provided in 36 CFR Part 60.4. SBFCA will assist in implementing necessary technical work, as indicated in the PA, subject to USACE and SHPO review.
- The recorded resources and the resource evaluations will be summarized in an inventory and evaluation report (unless testing is required to complete the evaluation, as described below).
- ~~SBFCA and~~ USACE will make a finding of effect; a significant effect will occur if the project would alter, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR Part 800.5[a][1]). SBFCA will assist in implementing necessary technical work, as indicated in the PA, subject to USACE and SHPO review.
- Where necessary~~,~~ and as required by USACE, ~~and~~ SBFCA ~~and SBFCA~~ will conduct test excavation to support the evaluation and finding of effect. Test excavation is typically performed to retrieve a suitable sample of material to determine the constituents and integrity of the resource. Test excavation will be conducted in consultation with SHPO and other relevant parties. Test excavation will follow a testing plan developed in consultation with SHPO, either for the specific resource or as part of the treatment methods developed pursuant to the ~~programmatic agreement~~PA that USACE is preparing in consultation with SHPO.

- For all resources subject to significant effects, USACE and SBFCA will implement treatment in consultation with SHPO and other relevant parties such as Native American stakeholders and the public.

~~To satisfy the requirements of CEQA, SBFCA will also evaluate identified resources to determine if they are historical resources (State CEQA Guidelines §15064.5[a]), unique archaeological resources under CEQA (PRC §21083.2[g]), and/or eligible for local registers.~~

~~SBFCA will determine if the project will result in significant effects on historic properties, historical resources, or unique archaeological sites. A significant effect will be found if the project would result in one or more of the following.~~

- ~~Demolish or materially alter the qualities that make the resource eligible for listing in the CRHR (State CEQA Guidelines §15064.5[b][2][A],[C]).~~
- ~~Demolish or materially alter the qualities that justify the inclusion of the resource on a local register or its identification in a historical resources survey that meets the requirements of PRC §5024.1(g), unless SBFCA establishes by a preponderance of evidence that the resource is not historically or culturally significant (State CEQA Guidelines §15064.5[b][2][B]).~~
- ~~Alter, directly or indirectly, the qualities that make a resource eligible for listing in the NRHP (36 CFR Part 800.5[a][1]).~~
- ~~Demolish or materially impair the qualities that allow a resource to qualify as a unique archaeological site (PRC §21083.2).~~

~~For all resources qualifying as unique archaeological resources, historical resources, or historic properties that will be subject to significant effects, SBFCA will develop treatment methods. Such treatment will consist of the following, listed in the order of priority that SBFCA must follow under CEQA.~~

- ~~Preservation in place will occur where feasible, through methods such as redesign of relevant facilities to avoid destruction or damage to eligible cultural resources, capping resources with fill, or deeding resources into conservation easements.~~
- ~~Data recovery excavations will be conducted by qualified cultural resources specialists to retrieve the information that makes the resource eligible for CRHR or NRHP listing or that qualifies the site as a unique archaeological resource or a local register–eligible resource. If data recovery through excavation is the appropriate mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the resource, will be prepared and adopted prior to any excavation being undertaken. Such studies will be deposited with the relevant CHRIS center. The data recovery plan will specify the basis for the significance of the resource and methods for retrieving the consequential information from the site. After completion of excavation, SBFCA will synthesize the findings into a data recovery report describing the findings and will deposit the report at the relevant CHRIS center.~~

~~The treatment plan will identify treatment methods that are proposed by SBFCA and which measures are proposed by other public entities. The plan will also specify the basis for selecting a particular mitigation measure. Treatment need not be completed before the FEIS/FEIR is prepared, but the evaluation of effects and selection of treatment will be summarized in the FEIS/FEIR.~~

~~If preservation in place of archaeological sites that qualify as historical resources or unique archaeological resources is not feasible in light of costs, logistics, technological considerations, the location of the find, and the extent to which preservation of the find is consistent or inconsistent with the design and objectives of the FRWLP, SBFCA will include a discussion in the treatment plan describing why the selected mitigation serves the interests protected by CEQA better than preservation in place.~~

~~SBFCA currently estimates that data recovery may be necessary for all of the archaeological sites that may be affected by the project alternatives, because construction is constrained to existing levees and the vicinity; the durable nature of existing flood control works makes avoidance of cultural resources potentially infeasible. Data recovery thus serves the environmental protection goals of CEQA by ensuring that valuable information that would otherwise be lost will be retained to the extent feasible. Potential resource-specific treatments are identified in Appendix I, Table I-4.~~

Construction will also be monitored, and discoveries of human remains will be treated as prescribed under Mitigation Measures CR-MM-2 and CR-MM-3, below.

Effect CR-2: Potential to Disturb Unidentified Archaeological Sites

The footprint of the proposed alternatives is sensitive for buried and obscured archaeological sites that cannot always be identified in advance of construction. Because much of the right-of-way occurs within natural floodplains, archaeological sites in the right-of-way are subject to the geological processes associated with river systems and flooding. During prehistory, sites were formed over many millennia. When habitation ceased or flood events occurred, interrupting human occupation, these sites may have been obscured by the deposition of sediment. In addition, because of the intensity of farming activity in the historic era, surface manifestations for prehistoric sites may have been obscured by cultivation, leaving portions of the site below grade with no visible indication above ground. Geological processes may obscure historic-era sites as well. In addition, SBFCA does not currently have rights-of-entry to complete inventory in the entire project area; previously unidentified sites may occur in these locations. As required by USACE, SBFCA will complete ~~A~~an inventory in these locations per Mitigation Measure CR-MM-1 above.

Because these sites may contain important data useful in research, and may have integrity to convey this data, these sites may qualify as historic properties~~, historical resources, or unique archaeological resources~~. Disturbance of these resources through direct excavation would~~d~~ ~~materially impair these resources under CEQA and~~ result in significant effects under Section 106 by disrupting scientifically meaningful associations.

While probabilistic subsurface excavation is a standard tool that is available to identify such sites, the scale of the project area and the size of such sites in relation to the acreage affected by the project create conditions where identification of all buried and unknown sites may not be possible. For these reasons, these sites may remain undetected prior to construction. It is particularly worth noting that the construction of deep slurry cutoff walls may disturb deeply buried early Holocene or Pleistocene sites that exist far below grade where there is no feasible means to identify such resources prior to disturbance. Buried sites may contain human remains in addition to archaeological debris. While mitigation is available to minimize these effects under Mitigation Measure CR-MM-2, this mitigation would not ensure that these effects would be avoided. For this reason, this effect is significant and unavoidable.

Mitigation Measure CR-MM-2: Implement a Cultural Resources Discovery Plan, Provide Related Training to Construction Workers, and Conduct Construction Monitoring

Prior to ground-disturbing construction, ~~FRWLP proponents~~ SBFCA will include a cultural resources discovery plan in the contract conditions of the construction contractor, incorporating the following actions to be taken in the event of the inadvertent discovery of cultural resources. USACE is responsible for completing management steps necessary to comply with NEPA and Section 106 of the NHPA; SBFCA will provide technical work in support of this compliance, subject to the review and authority of USACE and SHPO. Appendix J contains the PA which provides a detailed description of how relevant management steps will be performed.

- An archaeological monitor will be present to observe construction at geographic locations that are sensitive for unidentified cultural resources. Such locations will consist of construction areas near identified cultural resource(s) sites (within a 200-foot radius around the known boundaries of identified resources) and where ground-disturbing construction will occur within 1,500 feet of major water features.
- In the event of an archaeological resource discovery, work will cease in the immediate vicinity of the find, based on the direction of the archaeological monitor or the apparent distribution of cultural resources if no monitor is present. A qualified archaeologist will assess the significance of the find and make recommendations for further evaluation and treatment as necessary.
- Discovered resources will be mapped and described on DPR forms. Mapping will be performed by recording data points digitally with GPS hardware.
- ~~SBFCA will evaluate identified resources to determine if they are unique archaeological sites or historical resources.~~ In consultation with SHPO, USACE will evaluate identified resources to determine if they are historic properties. Test excavations will be performed where necessary to support evaluation. Evaluation and treatment will follow the standards and order of priority described above for Mitigation Measure CR-MM-1, with the exception of timing. Discoveries may occur after the FEIS/FEIR and thus need not be described in that document. SBFCA will assist USACE in implementing these steps as provided for in the PA (Appendix J), subject to USACE and SHPO review.
- In consultation with SHPO, USACE will make a finding of effect for eligible resources, and for all adversely affected resources, resolve adverse effects as required under the PA (Appendix J).
- If human remains are discovered as part of the deposit, SBFCA, USACE, and the contractors will coordinate with the county coroner and NAHC to make the determinations and perform the management steps prescribed in California Health and Safety Code Section 7050.5 and PRC §5097.98.
- If Native American human remains are discovered on Federal land, work in the immediate vicinity will cease, and SBFCA and USACE will contact the relevant representative of the Federal agency where the remains were discovered, as prescribed in 25 USC §3002(d) (NAGPRA). After notification from the relevant agency representative and treatment of the remains as required under NAGPRA, work may continue. Disposition of the remains will follow the ownership priority described in NAGPRA (25 USC §3002[a]).

SBFCA and USACE will develop a list of cultural resources staff who can respond to cultural resources discoveries and as required by USACE, SBFCA ~~and USACE~~ will also develop training materials for construction workers regarding management direction following discoveries. The staff list and training materials will be provided to the supervisory field staff. As required by USACE, SBFCA ~~and USACE,~~ or ~~their~~ its archaeological consultant, will conduct training for construction workers that provides an overview of cultural resources identification and this mitigation measure.

Effect CR-3: Potential to Disturb Native American Human Remains

The project area is located in an area of moderate to high sensitivity for archaeological cultural remains, including Native American burials. Some of the identified archeological resources contain burials, and the remaining right-of-way is sensitive for additional archaeological sites. Ground-disturbing work necessary to construct proposed levee improvements may inadvertently damage and disturb these resources before they can be discovered. In particular, slurry cutoff walls may disturb these resources at depths where the resource cannot be identified, even during monitoring. Slurry cutoff wall construction occurs through use of a bentonite mixture that obscures artifacts and cultural material, making identification infeasible or at least unlikely during monitoring of these features in particular. Mitigation Measure CR-MM-3 would reduce the severity of this effect, but it cannot guarantee the effect would be avoided. For these reasons, this effect remains significant and unavoidable.

Mitigation Measure CR-MM-3: Monitor Culturally Sensitive Areas during Construction and Follow State and Federal Laws Governing Human Remains if Such Resources Are Discovered

SBFCA ~~and USACE~~ will retain a qualified archaeologist to monitor areas of sensitivity for previously unidentified archaeological resources and Native American human remains, as required under Mitigation Measure CR-MM-2. USACE is responsible for completing management steps necessary to comply with NEPA and Section 106 of the NHPA; SBFCA will provide technical work in support of this compliance, subject to the review and authority of USACE and SHPO. Appendix J contains the PA which provides a detailed description of how relevant management steps will be performed. The following actions will be taken.

- If Native American human remains are discovered as part of the deposit or in isolation, work will cease in the immediate vicinity and within the radius necessary to avoid further disturbance. SBFCA, USACE, and the contractors will coordinate with the county coroner and NAHC to make the determinations and perform the management steps prescribed in California Health and Safety Code §7050.5 and PRC §5097.98. This coordination requires the following steps.
    - The county coroner will be notified so that he/she may determine if an investigation regarding the cause of death is required. If the coroner determines that the remains are of prehistoric Native American origin, the coroner will notify the NAHC.
    - Upon notification, the NAHC will identify the most likely descendant (MLD), and the MLD will be given the opportunity to reinter the remains with appropriate dignity. If the NAHC fails to identify the MLD or if the parties cannot reach agreement as to how to reinter the remains as described in PRC §5097.98(e), the landowner will reinter the remains at a location not subject to further disturbance. SBFCA and USACE will ensure

the protections prescribed in PRC §5097.98(e) are performed, such as the use of conservation easements and recording of the location with the relevant county.

- If Native American human remains are discovered on Federal land, work in the immediate vicinity will cease, and SBFCA and USACE will contact the relevant representative of the Federal agency where the remains were discovered, as prescribed in 25 USC §3002(d) (NAGPRA). After notification from the relevant agency representative and treatment of the remains as required under NAGPRA, work may continue. Disposition of the remains will follow the ownership priority described in NAGPRA (25 USC §3002[a]).
- As required by USACE, SBFCA ~~and USACE~~ will include an overview of the potential for encountering human remains and an overview of this mitigation measure in the training performed under Mitigation Measure CR-MM-2.

Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities

Identified built environment resources consist of structures associated with the historical themes of transportation, water conveyance, and commercial development. ~~A total of 17 identified~~Identified and potentially eligible built environment resources that may be affected by this alternative are identified in ~~(~~Appendix I (~~I,~~ Table I-5).

Because these resources are associated with the historical settlement and development of the region, they may have significance ~~under 14 CCR §4852(b)(1)(association with the broad patterns of California or local history).~~within the meaning of the NRHP. If these resources retain their setting and character-defining elements, they may have integrity under ~~14 CCR §4852(c~~the NRHP~~)~~. For these reasons, ~~these resources may qualify as historical resources under CEQA. For similar reasons,~~ these resources may qualify as historic properties under NRHP (36 CFR Part 60.4[a]). ~~Because the~~It should be noted that the settlement, development, and reclamation of the Sacramento Valley is~~are~~ significant at both the local and state levels~~, these resources may be NRHP-eligible if they retain integrity~~. Demolition of these structures may be required for the construction of new levee improvements such as seepage berms, stability berms, or wider levee prisms. In addition, even if demolition does not occur, these new features may not be consistent with the setting. Construction may also generate substantial vibration (e.g., soil compaction is typically required for seepage berm construction). Vibration may damage structures. For these reasons, construction may impair the ability of these resources to convey their significance, resulting in ~~a significant effect under CEQA. For resources that qualify as historic properties, this effect would also be~~ a significant effect under NEPA and Section 106. The basis for the conclusion that individual resources are register-eligible is provided in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Potentially affected built environment resources and potential resource-specific treatments are identified in Appendix I, Table I-5.

Although mitigation is available to reduce this effect, mitigation cannot guarantee these effects would be avoided entirely. Because mitigation cannot guarantee avoidance of these effects, this effect ~~is significant and unavoidable~~remains significant.

An inventory for the right-of-way required for the project alternatives has not been completed because not all rights-of-entry have been secured. The presence of identified built environment resources and a review of aerial photographs indicate that the right-of-way is sensitive for additional unidentified built environment resources. Such resources may consist of individual

structures and residences or landscape-scale features such as rural historic landscapes (U.S. Department of the Interior 1999). In addition, built environment features such as community gathering halls or traditional activity areas may consist of traditional cultural properties (Parker and King 1998). The right-of-way for the proposed alternatives is sensitive for these types of resources because of the intensity of activity in the historic (and prehistoric) era and because the rural setting makes it more likely that these resources may have remained intact. These resources may qualify ~~as historical resources under CEQA or~~ as historic properties under NRHP for their integrity, if they remain intact, and their association with important historic-era themes identified in this setting.

The construction of new levee improvements such as seepage berms, stability berms, or wider levee prisms may require demolition of built environment resources that would be identified through inventory and evaluation efforts. Even if demolition does not occur, these new features may not be consistent with the setting. For these reasons, construction may impair the ability of these resources to convey their significance. While mitigation is available to reduce these effects under Mitigation Measure CR-MM-4, this mitigation cannot guarantee all effects would be avoided. For these reasons, this effect remains significant and unavoidable.

Mitigation Measure CR-MM-4: Conduct Inventory of Built Environment Resources, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects

~~Prior to completion of the FEIS/FEIR, SBFCA and~~ USACE will ensure that an inventory and evaluation report is completed for all areas where effects on built environment resources may occur. USACE is responsible for completing management steps necessary to comply with NEPA and Section 106 of the NHPA; SBFCA will provide technical work in support of this compliance, subject to the review and authority of USACE and SHPO. Appendix J contains the PA which provides a detailed description of how relevant management steps will be performed.

- The scope of the inventory will include the entire area where effects may occur. Such effects consist of direct disturbance, damage through vibration, and/or changes to the setting.
- The work will be led or supervised by architectural historians who meet the Secretary of the Interior's professional qualification standards provided in 36 CFR Part 61.
- Inventory methods and evaluation will include pedestrian surveys, photographic documentation, and historical research using primary and secondary sources, interviews, and oral histories.
- Identified resources will be mapped and described on forms provided by DPR. Mapping will be performed by recording data points digitally with GPS hardware.
- ~~For all identified resources, SBFCA will determine if they are historical resources (State CEQA Guidelines §15064.5[a]), significant historical resources under CEQA (PRC §21084.1), and/or eligible for local registers.~~ USACE, in consultation with SHPO, will evaluate these resources to determine if they are historic properties (36 CFR Part 60.4).
- The recorded resources and the resource evaluations will be summarized in an inventory report. ~~In the inventory report, SBFCA and USACE will also determine if individual resources qualifying as historical resources or historic properties will be subject to significant effects. SBFCA will make such a finding if the FRWLP would result in any of the following actions.~~

- ~~Demolish or materially alter the qualities that make the resource eligible for listing in the CRHR (State CEQA Guidelines §15064.5[b][2][A],[C]).~~
- ~~Demolish or materially alter the qualities that justify the inclusion of the resource on a local register or its identification in a historical resources survey meeting the requirements of PRC §5024.1(g), unless SBFCA establishes by a preponderance of evidence that the resource is not historically or culturally significant (State CEQA Guidelines §15064.5[b][2][B]).~~
- ~~Cause a substantial significant change in the significance of a historical resource (PRC §21084.1).~~

- USACE~~,~~ in consultation with SHPO, will make a finding of effect to determine if the project will result in significant effects on NRHP-eligible resources. A finding of adverse (i.e., significant) effect will be made if the project would alter, directly or indirectly, the qualities that make a resource eligible for listing on the NRHP (36 CFR 800.5[a][1]).
- For all resources subject to significant effects (or adverse effects under NEPA), USACE ~~and SBFCA~~ will require development and implementation of appropriate treatment. ~~Treatment will prioritize avoidance and preservation in place. SBFCA will have sole responsibility for mitigating effects on resources that only qualify as historical resources under CEQA without qualifying as historic properties under Section 106.~~ Where avoidance or relocation are~~is~~ not feasible, standard treatment such as documentation through the Historic American Building Survey, Historic American Landscape Survey, or Historic American Engineering Record will be completed. Other documentation such as district documentation, interpretive displays, or walking tours may also be considered and implemented as appropriate.
- ~~SBFCA and USACE will complete the inventory, evaluation, and selection of treatment prior to certification of the FEIS/FEIR. In the FEIS/FEIR, SBFCA and USACE will summarize the list of eligible and affected resources, the selected treatment, and the basis for selection of treatment in the FEIS/FEIR. Preservation in place will be prioritized as treatment. Where preservation in place is not feasible, SBFCA and USACE will explain the need for other methods.~~
- ~~For affected built environment resources that may be affected by the project alternatives, SBFCA currently estimates that documentation or relocation of existing resources rather than avoidance may be necessary because construction is constrained to existing levees and the vicinity; the durable nature of existing flood control works makes avoidance of cultural resources potentially infeasible. Documentation or relocation thus serves the environmental protection goals of CEQA by ensuring that valuable information that would otherwise be lost will be retained to the extent feasible. Potential resource-specific treatments are identified in Appendix I, Table I-5.~~

3.17.4.3 Alternative 2

Implementation of Alternative 2 would potentially result in effects on cultural resources. These potential effects and related mitigation measure requirements are summarized in Table 3.17-3 and discussed below.

Table 3.17-3. Cultural Resources Effects and Mitigation Measures for Alternative 2

Effect	Finding	Mitigation Measures	With Mitigation
Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities	Significant	CR-MM-1: Perform Field Studies, Evaluate Identified Resources and Determine Effects, and Develop Treatment to Resolve Significant Effects	Significant and unavoidable
Effect CR-2: Potential to Disturb Unidentified Archaeological Sites	Significant	CR-MM-2: Implement a Cultural Resources Discovery Plan, Provide Related Training to Construction Workers, and Conduct Construction Monitoring	Significant and unavoidable
Effect CR-3: Potential to Disturb Human Remains	Significant	CR-MM-3: Monitor Culturally Sensitive Areas during Construction and Follow State and Federal Laws Governing Human Remains if Such Resources Are Discovered	Significant and unavoidable
Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities	Significant	CR-MM-4: Conduct Inventory of Built Environment Resources, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects	Significant and unavoidable

Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities

A range of archaeological resources have been identified that may be affected by this alternative (~~nine resources as indicated in~~ Appendix I, Table I-4). This effect would be substantially similar to the effect described for Alternative 1, as identified archaeological resources likewise occur in the footprint of this alternative. Individual site descriptions and potential register eligibility are described in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Potential resource-specific treatments are identified in Appendix I, Table I-4. Because this proposed alternative represents a larger footprint than Alternative 1, it is likely that a greater number of resources would be identified through inventory efforts. However, the overall significance conclusion is the same as Alternative 1. Implementation of Mitigation Measure CR-MM-1 described under the Alternative 1 discussion is available to reduce this effect, but the effect would remain significant and unavoidable.

Effect CR-2: Potential to Disturb Unidentified Archaeological Sites

This effect would be substantially similar to the effect described for Alternative 1, as the right-of-way for this alternative is likewise sensitive for resources that have not yet been identified and which cannot feasibly be identified in advance of construction. Because Alternative 2 involves a larger footprint than Alternative 1, this alternative may affect more cultural resources than Alternative 1. However, the overall significance conclusion is identical to that of Alternative 1. Implementation of Mitigation Measure CR-MM-2 described under the Alternative 1 discussion is available to reduce this effect, but the effect would remain significant and unavoidable.

Effect CR-3: Potential to Disturb Human Remains

This effect would be substantially similar to the effect described for Alternative 1, as the right-of-way is likewise sensitive for unidentified human remains. Because Alternative 2 involves a larger

footprint than Alternative 1, the likelihood of disturbing buried human remains is greater under Alternative 2 than under Alternative 1. However, the overall significance conclusion is identical to that of Alternative 1. Implementation of Mitigation Measure CR-MM-3 described under the Alternative 1 discussion is available to reduce this effect, but the effect would remain significant and unavoidable.

Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities

A ~~total of 16 identified~~number of ~~and~~ potentially NRHP-eligible built environment resources may be affected by this alternative (Appendix I, Table I-5).This effect would be substantially similar to the effect described for Alternative 1, as identified and previously unrecorded built environment resources that are likely to qualify as historical resources or historic properties may likewise occur in the right-of-way and may be significantly affected by the construction of improvements. The basis for the conclusion that individual resources are register-eligible is provided in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Potentially affected built environment resources and potential resource-specific treatments are identified in Appendix I, Table I-5. Because this alternative involves a larger footprint than Alternative 1, it is likely that a greater number of resources would be identified through inventory efforts once all rights of entry are secured. However, the overall significance conclusion is identical to that of Alternative 1. Implementation of Mitigation Measure CR-MM-4 described under the Alternative 1 discussion is available to reduce this effect, but the effect would remain significant and unavoidable.

3.17.4.4 Alternative 3

Implementation of Alternative 3 would potentially result in effects on cultural resources. These potential effects and related mitigation measure requirements are summarized in Table 3.17-4 and discussed below.

Table 3.17-4. Cultural Resources Effects and Mitigation Measures for Alternative 3

Effect	Finding	Mitigation Measures	With Mitigation
Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities	Significant	CR-MM-1: Perform Field Studies, Evaluate Identified Resources and Determine Effects, and Develop Treatment to Resolve Significant Effects	Significant and unavoidable
Effect CR-2: Potential to Disturb Unidentified Archaeological Sites	Significant	CR-MM-2: Implement a Cultural Resources Discovery Plan, Provide Related Training to Construction Workers, and Conduct Construction Monitoring	Significant and unavoidable
Effect CR-3: Potential to Disturb Human Remains	Significant	CR-MM-3: Monitor Culturally Sensitive Areas during Construction and Follow State and Federal Laws Governing Human Remains if Such Resources Are Discovered	Significant and unavoidable
Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities	Significant	CR-MM-4: Conduct Inventory of Built Environment Resources, Evaluate Identified Properties, Assess Effects, and Prepare Treatment to Resolve and Mitigate Significant Effects	Significant and unavoidable

Effect CR-1: Effects on Identified Archaeological Sites Resulting ~~F~~from ~~Construction of~~ Levee ~~Improvements~~ Construction and Ancillary Facilities

A range of archaeological resources have been identified that may be affected by this alternative (~~nine resources as indicated in~~ Appendix I, Table I-4). This effect would be substantially similar to the effect described for Alternative 1, as identified archaeological resources likewise occur in the footprint of this alternative. Individual site descriptions and potential register eligibility are described in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Potentially affected sites and resource-specific treatments are identified in Appendix I, Table I-4. Implementation of Mitigation Measure CR-MM-1 described under the Alternative 1 discussion above is available to reduce this effect, but the effect would remain significant and unavoidable.

Effect CR-2: Potential to Disturb Unidentified Archaeological Sites

This effect would be substantially similar to the effect described for Alternative 1, as the right-of-way for this alternative is likewise sensitive for resources that have not yet been identified and which cannot feasibly be identified in advance of construction. Implementation of Mitigation Measure CR-MM-2 described under the Alternative 1 discussion is available to reduce this effect, but the effect would remain significant and unavoidable.

Effect CR-3: Potential to Disturb Human Remains

This effect would be substantially similar to the effect described for Alternative 1, as the right-of-way is likewise sensitive for unidentified human remains. Implementation of Mitigation Measure CR-MM-3 described under the Alternative 1 discussion is available to reduce this effect, but the effect would remain significant and unavoidable.

Effect CR-4: Direct and Indirect Effects on Built Environment Resources Resulting from Construction Activities

A ~~total of four~~range of identified and potentially eligible built environment resources may be affected by this alternative (Appendix I, Table I-5). This effect would be substantially similar to the effect described for Alternative 1, as identified and previously unrecorded built environment resources that are likely to qualify as historical resources or historic properties likewise may occur in the right-of-way and may be significantly affected by the construction of improvements. The basis for the conclusion that individual resources are register-eligible is provided in Appendix I, Section I.4, *Identified Resources Affected by the Action Alternatives.* Potentially affected built environment resources and potential resource-specific treatments are identified in Appendix I, Table I-5. Implementation of Mitigation Measure CR-MM-4 described under the Alternative 1 discussion above is available to reduce this effect, but the effect would remain significant and unavoidable.

Chapter 4
Growth-Inducing and Cumulative Effects

4.1 Growth-Inducing Effects

4.1.1 Introduction

NEPA and CEQA require that an EIS and EIR discuss how a project, if implemented, could induce growth. The following sections present an analysis of the potential growth-inducing effects of the FRWLP. They discuss regulatory background information, the methods used to analyze growth-inducing effects, and conclusions about those effects.

4.1.2 Affected Environment

4.1.2.1 Regulatory Setting

NEPA and CEQA Requirements

Under authority of NEPA, CEQ regulations require an EIS to consider the potential indirect effects of a proposed action. The indirect effects of an action include those that occur later in time or farther away in distance but are still reasonably foreseeable. They may include "growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate" (40 CFR Section 1508.8[b]).

In addition, Section 21100(b)(5) of CEQA requires an EIR to discuss how a proposed project, if implemented, may induce growth and the impacts of that induced growth (see also State CEQA Guidelines Section 15126). CEQA requires an EIR to discuss specifically "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment" (State CEQA Guidelines Section 15126.2[d]).

Floodplain Development Regulations

EO 11988 (May 24, 1977) requires a Federal agency, when taking an action, to avoid short- and long-term adverse effects associated with the occupancy and modification of a floodplain, and it must avoid direct and indirect support of floodplain development whenever there is a reasonable and feasible alternative. If the only reasonable and feasible alternative is to site the proposed action in a floodplain, the agency must explain why and must minimize potential harm to or in the floodplain.

In February 1978, the Water Resources Council issued Floodplain Management Guidelines for Implementing EO 11988. These guidelines provide analysis of the EO, definitions of key terms, and an eight-step decision-making process for carrying out the EO's directives. The process contained in the Water Resources Council guidelines incorporates the basic requirements of the EO. The eight-step process is briefly outlined below, followed by discussion of how the FRWLP would apply the process to demonstrate compliance with EO 11988.

- **Step 1: Determine whether a proposed action is in the base floodplain.** (A base floodplain is defined as a 100-year floodplain [a 1% chance to flood] or, if the action falls under the definition of *critical*, discussed below, a 500-year floodplain [a 0.2% chance to flood]). The project area for the FRWLP includes the footprint of the levee improvement work and the floodplain that receives a benefit from the reduction in flood risk associated with the improvements. The levee work would be~~is~~ located primarily on and adjacent to the west levee along the Feather River in Butte and Sutter Counties. ~~Not only is it not directly within the base 100-year floodplain, but it~~The project would reduce the risk of flooding in the adjacent floodplain and would ~~ultimately improve the current level of protection to reach~~ achieve the State of California's goal of 200-year protection for more populated areas, as determined by SBFCA. ~~The current FEMA 100-year floodplain is waterward of the levee. Within the affected area, the top-of-levee elevation ranges from 87.0 to 139.7 feet (NAVD88) and the toe-of-levee ranges from 68.0 to 136.0 feet (NAVD88). The FEMA floodplain presently ranges from 51.5 to 53.3 feet (NAVD88).~~ The proposed project is described in Chapter 2, *Alternatives*, including location, construction methods, and operation and maintenance activities.

  The Water Resources Council Floodplain Management Guidelines present the concept of a *critical action*. While they offer no precise definition, the guidelines (under Part II, Decision-Making Process, Step 1C) outline parameters and describe a critical action as "any activity for which even a slight chance of flooding is too great." This definition is intended to apply to Federal actions that would involve facilities or infrastructure sensitive to flooding (i.e., for which the consequences of flooding would be severe in terms of ability to provide essential community services or to protect life and welfare). The floodplain that would be affected by the FRWLP includes a number of these critical facilities, such as hospitals, police stations, and schools. For this reason, USACE and SBFCA have concluded that the FRWLP is a "critical action." The project would benefit critical facilities already located in the floodplain by reducing the risk of flooding.~~would not be sensitive to or compromisedby flooding because it is the levee project itself that would reduce the chance of flooding.Therefore, the FRWLP is not considered a critical action because the project purpose is to withstand flood conditions, reduce flood risk, and increase flood protection~~.

- **Step 2: Provide public review.** The NEPA/CEQA process provides for public disclosure; this EIS/EIR is one instrument for public review of the FRWLP. As discussed in Chapter 1, *Introduction*, USACE and SBFCA have established a proactive multimedia outreach program to publicize the project and allow for public review and disclosure. The approach to the outreach program has been to go beyond the guidelines and requirements of NEPA and CEQA for public noticing to ensure the community and other interested stakeholders are informed, engaged, and involved through an accessible, open, and transparent process. Thus far, the outreach program has included the following actions.
  - Four scoping meetings for the environmental document.
  - Publication of notices in local newspapers of major circulation.
  - Publication in the Federal Register.
  - Notification to the State Clearinghouse.
  - Posting NEPA notices on the USACE website.
  - Posting CEQA notices and project information on the SBFCA website (www.sutterbutteflood.org).

- Periodic newsletters provided to the parcel owners in the flood improvement assessment district.
- Presentation and discussion of the status of the project at various public meetings for elected boards.
- Phone calls to public agencies.

As the proposed actions and EIS/EIR are further developed, the outreach program would continue in a broad sense through the methods listed above and would expand through more targeted specific outreach to residents and businesses who might be more directly affected by construction or operation of the proposed improvements.

To date, the results of the outreach program have been constructive and very supportive of the FRWLP. The tone and substance of the input have been consistent with the very favorable response for the voter-approved assessment to fund the local share of flood improvements. Comments received from the public have been considered in order to help refine the project description and the environmental analysis.

A more detailed accounting of the scoping process is provided in Appendix B, *Scoping Report.*

- **Step 3: Identify and evaluate reasonable and feasible alternatives to locating in the base floodplain.** Previously, Butte and Sutter Counties have not been mapped in the base floodplain, and land use planning decisions have been based on studies demonstrating ~~protection from~~ that existing levees provide an acceptable level of performance for the base flood. Only recent studies (as described in Chapter 1, *Introduction*), based on evolving levee standards, now necessitate improvements to continue ~~maintaining protection above~~to provide the same level of performance ~~the base floodplain~~. The proposed project (the FRWLP) is targeted specifically to provide such improvements and increase~~exceed~~ the level of ~~protection~~performance beyond the base flood to that of the 0.5% chance (200-year) flood event, per goals set by the State of California, for more populated areas in, around, and north of Yuba City and to the 100-year event for the area south of Yuba City.

  General engineering and environmental analyses have been performed for the FRWLP following an identification and screening process discussed in Chapter 2, Alternatives. Detailed analyses performed for the alternatives have found the proposed project to be the only practicable alternative that achieves the project objectives. Construction of the FRWLP would keep thousands of transportation, commercial, institutional, and residential structures and nearly 200,000 residents out of the 0.5% chance (200-year)~~base~~ floodplain.

- **Step 4: Identify the effects of the proposed action.** This EIS/EIR analyzes the environmental effects potentially resulting from the FRWLP per NEPA/CEQA requirements. Review under the ESA, CWA, CAA, and other Federal and state environmental regulations is taking place in coordination with the EIS/EIR. Effects of the FRWLP are analyzed in Chapter 3, *Affected Environment and Environmental Consequences*. In brief, the FRWLP may have temporary construction-related effects on roadways, air quality from heavy equipment use, biological resources (due to temporary disruption of or construction near habitat), temporary construction-related effects on residents due to noise generation, changes in visual quality, and interruption in utility service and property access. The project also may necessitate property acquisition, either through temporary construction easements or permanent increases in the levee footprint. Growth inducement is also a potential effect, and is discussed in this chapter.

- **Step 5: Minimize threats to life and property and to natural and beneficial floodplain values. Restore and preserve natural and beneficial floodplain values.** The FRWLP would reduce flood risk to life and property in the affected areas of ~~for~~ Butte and Sutter Counties ~~and increase protection for life and property in the affected area~~. The existing levee system was designed and constructed to provide a minimum level of ~~protection~~ performance for~~from~~ the base flood and ensure that human life and structures are out of the base floodplain. The State of California's and SBFCA's target for the FRWLP ~~target~~ is to maintain and increase the level of ~~protection~~ performance beyond that of the base flood to a minimum 200-year ~~protection~~ event (0.5% chance) for more populated areas in, around, and north of Yuba City and to a 100-year ~~protection~~ event for the area south of Yuba City.
- **Step 6: Reevaluate alternatives.** This EIS/EIR is part of a step-wise evaluation process to refine the alternatives through public review as well as through resource and regulatory agency input in consultation for compliance with the CWA, ESA, and other project authorizations. The alternatives have been evaluated at the planning level for initial screening (in Chapter 2, *Alternatives*) and for reevaluation through environmental analysis (Chapter 3 *Affected Environment and Environmental Consequences*). The alternatives also are continuously evaluated on a technical basis through independent review of the design documents (plans and specifications) at several levels of design development, including expert peer review by a board of senior consultants. The recommendations and design refinements resulting from these reviews have been incorporated into the project description (Chapter 2), resource analyses and findings (Chapter 3), and project-level analyses and mitigation measures (Chapter 3). This level of screening analysis has demonstrated that the proposed actions of the FRWLP are the most practicable alternatives.
- **Step 7: Issue findings and a public explanation.** To conclude the NEPA process, a ROD for the FRWLP will be publically issued following the Final EIS. To conclude the CEQA process, findings would be publicly issued following the Final EIR. A public workshop was conducted during the draft document stage, and a public hearing was held to decide on project adoption by SBFCA as an action under CEQA.
- **Step 8: Implement the action.** SBFCA intends to construct the FRWLP as soon as possible based on conclusion of the project approval processes, targeted to be initiated in the 2013 construction season.

The FRWLP would reduce the risk of flood loss and minimize the effect of floods on human health, safety, and welfare by improving flood management infrastructure and would ~~increase protection~~reduce risk for existing population centers. The FRWLP would further reduce risk to ~~protect~~ farmland, agricultural commodities, and agricultural infrastructure for this crucial agricultural region. The FRWLP would be a substantial step toward compliance with state law requiring 200-year protection for urban and urbanizing areas and would avoid development restrictions outlined under SB 5. Therefore, the FRWLP is not in conflict with EO 11988; the project would reduce ~~improve~~ flood risk~~protection~~, and there is no reasonable and feasible alternative to the urban development already existing in the affected area. This EIS/EIR further complies with this EO by identifying the most reasonable and feasible flood improvement alternative and disclosing the potential effects of the FRWLP that may lead to growth or other direct and indirect effects. Additionally, Chapter 1, *Introduction*, and Chapter 2, *Alternatives*, explain why levee improvements are necessary for Butte and Sutter Counties, regardless of how they may affect future development and growth.

4.1.2.2 Environmental Setting

The information in this section provides context for the analysis and its structure and discusses the legal requirements for analyzing growth-inducing effects in CEQA and NEPA documents.

Growth Projections

Population is not static, and the population of California has been growing significantly. To provide statewide context for population change in the project region, California's population was estimated at 36 million people in 2005 and is expected to rise to nearly 44 million by 2025 (U.S. Bureau of the Census 2008). According to the California Department of Finance, "California's population is projected to reach almost 60 million people by 2050, adding over 25 million since the 2000 decennial census" (California Department of Finance 2007). The California Department of Finance provides population data estimates and projections for cities and counties throughout California. Population information for Butte and Sutter Counties is provided below.

Butte County

Between April 2000 and January 2010, the overall population of Butte County increased by 9.2%, growing from 203,171 to 221,768 people. Within that same timeframe, the incorporated city of Gridley saw an increase of 19.3%, with the estimated population rising from 5,408 to 6,454, and the city of Biggs saw a 0.9% decrease in population, going from 1,793 to 1,787. For comparison, the state's population rose 14.1% during the same period, from 33,873,086 to 38,648,090 (California Department of Finance 2010). Although the county population has been increasing steadily, the population of the unincorporated portion of the county has been declining as people move to urban areas and cities annex areas to accommodate this growth (Butte County 2010a: 32). Butte County had a population density of approximately 134 persons per square mile in 2010, compared with the state average of 239 persons per square mile (U.S. Census Bureau 2010).

The population of Butte County is expected to reach 281,442 by 2020 (California Department of Finance 2007). The city of Gridley is expected to reach 8,774 by 2020, assuming a growth rate of 2.86% per year (Redamonti pers. comm.). The city of Biggs is expected to reach a population of 2,136, based on a 1.5% growth rate per year (City of Biggs 1998:1-5).

By 2050, the total population of Butte County is expected to reach 441,596 (California Department of Finance 2007). Based on the Department of Finance's unofficial 2070 population estimates for Butte and Sutter Counties prepared for the Sutter Basin Project, Butte County is expected to reach a total population of 512,095. These projections are based on very preliminary analyses of migration and fertility trends, which could change. Also, it is important to note that 60-year projections are subject to an enormous amount of potential external changes that could render these values inaccurate (Schwarm pers. comm.). Despite the preliminary nature of these projections, the population in the affected area is expected to continue to increase, and it can be assumed that employment, income, and the demand for housing also would increase.

Sutter County

Between April 2000 and January 2010, the overall population of Sutter County increased by 25.6%, growing from 78,930 to 99,154. Within that same timeframe, the incorporated cities of Live Oak and Yuba City saw increases of 41.1% and 77.8%, respectively, with their estimated populations rising

from 6,229 to 8,791 and 36,758 to 65,372. In contrast, the state's population rose more slowly (14.1%) during that time, as noted above (California Department of Finance 2010).

Nearly two-thirds of the county's residents live in the cities of Live Oak and Yuba City (California Department of Finance 2010). However, Sutter County is primarily rural, with extensive agricultural areas and a low population density (Sutter County 2010a:1-7). The county had a population density of approximately 157 persons per square mile in 2010, compared with the state average of 239 persons per square mile (U.S. Census Bureau 2010).

The population of Sutter County is expected to reach 141,159 by 2020 (California Department of Finance 2007), and the city of Yuba City is expected to reach 79,000, based on an average annual growth rate of 2.5% per year (City of Yuba City 2004:2-3). According to the county's general plan (Sutter County 2010a:4-2):

> For nearly 40 years, and, in particular, since 1990, most of the growth in Sutter County has taken place in its two cities, Yuba City and Live Oak. Yuba City annexations and new development in the incorporated cities has increased the share of the county's incorporated population from 40% in 1970 to 75% in 2007. As a result, fewer people resided in unincorporated areas of the county in 2007 than in 1970. This trend is assumed to continue during the time horizon of the 2006–2013 housing element.

By 2050, Sutter County is expected to more than triple in size (+255%). In 2050, the total population of Sutter County is expected to reach 282,894 (California Department of Finance 2007). Based on the California Department of Finance's unofficial 2070 population estimates for Butte and Sutter Counties for the Sutter Basin Project, Sutter County is expected to reach a total population of 341,216. As is described for Butte County above, based on these projections, the population in the affected area would continue to increase, and it can be assumed that employment, income, and the demand for housing also would increase.

Current and Planned Development

To accommodate current populations and growth, development has been planned in Butte and Sutter Counties in accordance with California law. The key development planning documents are the following general plans.

- Butte County General Plan 2030 (Butte County 2010a).
- City of Biggs General Plan 1997–2015 (City of Biggs 1998).
- City of Gridley General Plan (City of Gridley 2010).
- Sutter County 2030 General Plan (Sutter County 2010a).
- City of Yuba City General Plan (City of Yuba City 2004).
- City of Live Oak General Plan (City of Live Oak 2010).

To account for growth relative to flood-risk management, the local governments in the affected area have in place the following flood-risk management programs. This list is not a comprehensive inventory, but rather is meant to demonstrate the responsibility communities are showing for flood-risk management and to provide a representation of the types of programs currently being implemented.

Butte County

- Butte County Flood Mitigation Plan.
- Public education and awareness programs.
- Land use planning and development restrictions in floodplains.
- Emergency Preparedness and Evacuation Plan.
- FEMA Community Rating System (CRS) Program.

City of Biggs

- Development restrictions in flood-prone areas.
- Emergency response plan and emergency evacuations routes.

Sutter County

- Sutter County Floodplain Management Ordinance, which includes the following flood-risk management measures.
    - Standards of construction to prevent flood damage.
    - Development restrictions in floodways.
- FEMA Community Rating System (CRS) Program.
- Emergency Operations Plan.
- Emergency Action Plan.
- Public Outreach Strategy Team.

City of Yuba City

- Flood Damage Prevention Ordinance, which includes the following flood-risk management measures.
    - Standards of construction to prevent flood damage.
    - Development restrictions in floodways.
- FEMA Community Rating System Program: Class 7.
- Emergency Evacuation Plan.
- Floodplain development permit requirement.
- Public Outreach Program.

City of Live Oak

- Development restrictions in flood-prone areas.
- Emergency Response Plan and emergency evacuations routes.

4.1.3 Environmental Consequences

An action that removes an obstacle to growth is considered to be growth-inducing. As such, where flood risk may be seen as an obstacle to growth in an area, levee improvements that would reduce

that risk may be considered to remove an obstacle to growth and thereby be indirectly growth-inducing.

Growth inducement may lead to environmental effects, such as increased demand for utilities and public services, increased traffic and noise, degradation of air or water quality, degradation or loss of plant or animal habitats, and conversion of agricultural and open space land to urban uses. Growth within a floodplain area increases the risk to people or property of flooding.

However, if the induced growth is consistent with or provided for by the adopted land use plans and growth management plans and policies for the area affected (e.g., city and county general plans, specific plans, transportation management plans), those plans may ensure that these effects are either less than significant or mitigated to a less-than-significant level. In some instances, significant and unavoidable effects would occur as a result of implementation of land use plans. All effects associated with this planned growth are the responsibility of the city or county in which the growth takes place. Local land use plans provide for land use development patterns and growth policies that encourage orderly urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer services, and solid waste services.

4.1.3.1 Effects and Mitigation Measures

No Action Alternative

Under the No Action Alternative, SBFCA would not implement levee improvements. The levees protecting the city would continue to deteriorate and necessitate improvements to meet FEMA's and the state's minimum acceptable levels of ~~flood protection~~performance. In addition, the associated risk to human health and safety and property and the adverse economic effect that serious flooding could cause would continue, and the risk of a catastrophic flood would remain high. Again, though no improvements would be implemented, regular operations and maintenance of ~~the~~ this levee system would continue as prescribed and as presently executed by the local maintaining entities. Further detail on the No Action Alternative is provided in Chapter 2, *Alternatives*.

As described in Chapter 2, despite the likelihood of Federally or state-led implementation of repairs, for the purposes of evaluating effects under the No Action Alternative, the EIS/EIR assumes that the improvements would not be made. This assumption provides the most conservative approach for disclosure and comparison of potential effects. Therefore, the No Action Alternative assumes no levee repair or strengthening would be implemented, the purpose and objectives would not be met, and flood risk would continue.

Action Alternatives

The FRWLP would incrementally reduce localized flood risk for the levee reaches proposed for improvement. However, these reaches are only a portion of the total levee system protecting Butte and Sutter Counties, and the remaining unimproved levees in the system also would determine FEMA mapping and build-out decisions. The FRWLP, if implemented, would potentially remove approximately 6,300 acres from the current officially mapped FEMA floodplain; however, none ~~only roughly 25%~~ of this acreage ~~(about 1,500 acres)~~ is within areas planned for growth under the adopted municipal general plans, based on a preliminary analysis of overlaying the area that could be potentially removed from the post-project FEMA floodplain with the sphere-of-influence of each city. This analysis is primarily based on topography, and the 6,300 acres are concentrated on three

areas of naturally higher ground east of Biggs and Gridley.~~Therefore, the project would facilitate general plan build-out for that area potentially removed from the FEMA floodplain.~~

Such build-out growth is part of the planned development of Butte and Sutter Counties. The counties and incorporated cities have general plans under which growth and increases in population could lead to effects on air and water quality, water supply, traffic, and noise conditions and increases in the demand for such public services as schools, fire, police, sewer, solid waste disposal, and electric and gas utilities. In addition, the expansion of such services could result in significant effects. The effects of this growth have been analyzed in the CEQA documents associated with these plans. Mitigation measures that would reduce or eliminate these effects are included. Ultimately, the effects associated with growth in Butte and Sutter Counties are the responsibility of cities and counties in which they occur, in combination with specific project proponents. The plans and programs listed under Section 4.1.2.2, *Environmental Setting*, as integral components of the general plans are in place to manage flood risk relative to development and population growth.

While growth in Butte and Sutter Counties is expected to occur in the future and is planned for in the development of infrastructure and municipal services, the FRWLP has limited influence on such growth because the area that would be potentially removed from the FEMA floodplain that is planned for development is zero~~very small (approximately 1,500 of the 185,675 acres of the affected area, or 0.8%)~~. The FRWLP, therefore, has no significant effect on growth considering the magnitude of this change. It should be further noted that while the project does remove a potential obstacle to growth by reducing the area subject to FEMA floodplain designation, it does not directly facilitate growth (like developing new water supply, utilities, or other infrastructure would, for example).

4.2 Cumulative Effects

4.2.1 Introduction

The cumulative effects analysis determines the combined effect of the proposed project and other closely related, reasonably foreseeable, projects. This section introduces the methods used to evaluate cumulative effects, lists related projects and describes their relationship to the proposed project, identifies cumulative effects by resource area, and recommends mitigation for significant cumulative effects.

4.2.2 Approach to Cumulative Effect Analysis

4.2.2.1 Legal Requirements

NEPA regulations and State CEQA Guidelines require that the cumulative effects of a proposed project be addressed under NEPA when the cumulative effects are expected to be significant, and under CEQA when the project's incremental effect is cumulatively considerable (Guidelines 15130[a], 40 CFR 1508.25[a][2]). Cumulative effects are effects on the environment that result from the incremental effects of a proposed project when added to other past, present, and reasonably foreseeable future projects (Guidelines 15355[b], 40 CFR 1508.7). Such effects can result from individually minor but collectively significant actions taking place over time.

Section 15130 of the State CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of impacts attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

4.2.2.2 Methods

According to the State CEQA Guidelines (Section 15130), an adequate discussion of significant cumulative impacts should contain the following elements.

- An analysis of related future projects or planned development that would affect resources in the project area similar to those affected by the proposed project.
- A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available.
- A reasonable analysis of the cumulative impacts of the relevant projects. An EIR must examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

To identify the related projects, the State CEQA Guidelines (Section 15130[b]) recommend either the list or projection approach. This analysis uses the list approach, which entails listing past, present, and probable future projects producing related or cumulative effects, including, if necessary, those projects outside the control of SBFCA. NEPA does not provide specific guidance as to how to conduct a cumulative effect assessment; however, the list approach has been effective at disclosing cumulative effects under NEPA.

A list of past, current, and probable future projects was compiled for the cumulative setting. These projects include other flood risk management~~protection~~ projects affecting the Feather River and the Sacramento River system (including those requesting Section 408 approval) and projects affecting fish and wildlife that use the proposed project area. Regional plans were reviewed to characterize development trends and growth projections in Butte and Sutter Counties. These plans are considered with the proposed project to determine whether the combined effects of all of the projects would result in significant cumulative effects.

4.2.3 Projects Considered for the Cumulative Assessment

4.2.3.1 Flood Risk Management~~Protection~~ Projects

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

The following list of related or similar flood risk management~~protection~~ projects includes those that are under active consideration, have been proposed, or have some form of environmental documentation complete. In addition, these projects have the potential to affect the same resources and fall within the same geographic scope and therefore are to be considered cumulatively with the

proposed project. In particular, the affected resources are biological resources (riparian habitat and wildlife disturbance), hydrology, and geomorphology. The geographic scope of consideration for effects on those resources is the Sacramento Valley region and Sacramento River system, respectively. These projects are described in Chapter 1, *Introduction*.

- Central Valley Flood Protection Act.
- Sacramento River Flood Control System Evaluation.
- Sacramento–San Joaquin Rivers Comprehensive Study.
- Sacramento River Bank Protection Project.
- Flood Control and Coastal Storm Emergency Act.
- Sutter Basin Project.
- Yuba Basin Project.
- American River Common Features Project.
- West Sacramento General Reevaluation Report.
- Lower Feather River Corridor Management Program.
- Three Rivers Levee Improvement Program.
- Natomas Levee Improvements Program.
- West Sacramento Levee Improvements Program.

4.2.3.2 Feather River West Levee Project Relevant Land Use Plans

Relevant land use plans were reviewed to assess past, present, and reasonably foreseeable development actions in the proposed project planning area that may affect the same resources as the FRWLP, or provide for the restoration, preservation, or enhancement of those resources.

- Butte County General Plan 2030 (Butte County 2010a).
- City of Biggs General Plan 1997–2015 (City of Biggs 1998).
- City of Gridley General Plan (City of Gridley 2010).
- Sutter County 2030 General Plan (Sutter County 2011).
- City of Yuba City General Plan (City of Yuba City 2004).
- City of Live Oak General Plan (City of Live Oak 2010).

4.2.3.3 Projects Affecting Fish and Wildlife That Use the Affected Area

The following programs and projects may affect the same species of fish or wildlife that may be affected by the proposed project.

CALFED Ecosystem Restoration Program

The goals of the CALFED Ecosystem Restoration Program are listed below.

- Recover 19 at-risk native species and contribute to the recovery of 25 additional species.

- Rehabilitate natural processes related to hydrology, stream channels, sediment, floodplains, and ecosystem water quality.
- Maintain and enhance fish populations critical to commercial, sport, and recreational fisheries.
- Protect and restore functional habitats, including aquatic, upland and riparian, to allow species to thrive.
- Reduce the negative effects of invasive species and prevent additional introductions that compete with and destroy native species.
- Improve and maintain water and sediment quality to better support ecosystem health and allow species to flourish.

The Ecosystem Restoration Program, which is divided into the Sacramento, San Joaquin, and Delta and Eastside Tributary regions, takes the following kinds of actions.

- Develops and implement habitat management and restoration actions, including restoration of river corridors and floodplains, reconstruction of channel-floodplain interactions, and restoration of Delta aquatic habitats.
- Restores habitat that would specifically benefit one or more at-risk species.
- Implements fish passage programs and conducts passage studies.
- Continues major fish screen projects and conducts studies to improve knowledge of their effects.
- Restores geomorphic processes in stream and riparian corridors.
- Implements actions to improve understanding of at-risk species.
- Develops an understanding of and technologies to reduce the effects of irrigation drainage on the San Joaquin River and reduce transport of contaminant (selenium) loads carried by the San Joaquin River to the Delta and the Bay.
- Implements actions to prevent, control, and reduce effects from nonnative invasive species.

Ecosystem Restoration Program actions contribute to cumulative benefits on fish and wildlife species, habitats, and ecological processes.

Bay Delta Conservation Plan

The BDCP provides for the recovery of endangered and sensitive species and their habitats in the Delta in a way that also provides for the protection and restoration of water supplies. The plan would identify and implement conservation strategies to improve the overall ecological health of the Delta; identify and implement more ecologically friendly ways to move fresh water through or around the Delta; address toxic pollutants, invasive species, and impairments to water quality; and provide a framework and funding to implement the plan over time.

Alternatives being evaluated include conveyance options using the through-Delta waterways, an isolated canal, or an isolated tunnel. The restoration options include various degrees of restoration in the Delta and Suisun Marsh. The final plan and the final EIS/EIR are expected to be completed in 2013. The BDCP could contribute to beneficial cumulative effects by increasing suitable habitat for fish and wildlife species.

PG&E Palermo-East Nicolaus Project

The Palermo to East Nicolaus Project is a capacity and reliability improvement project that includes the reconductoring of both spans of the existing 115-kV electric transmission line between PG&E's Palermo, East Nicolaus, and Rio Oso Substations with 45 miles of 1,113 all aluminum conductors or 457 steel supported aluminum conductor (SSAC). The transmission line traverses Butte, Yuba, and Sutter counties and the cities of Marysville and Oroville. The project is needed to ensure transmission system reliability in the Yuba/Sutter/Butte County area and to improve safety and reliability by replacing aging facilities. The project is currently under construction and is expected to be completed in 2014.

4.2.4 Cumulative Effects by Resource

4.2.4.1 Flood ~~Control~~ Risk Management and Geomorphic Conditions

The proposed project would not significantly contribute to cumulative effects on ~~flood control~~risk management and geomorphic conditions resulting from the various seepage control and erosion treatments. Because the west bank of the Feather River in the project area does not have any significant freeboard issues, levee raises have not been proposed. Levee raises can cause slight increases in upstream or downstream water surface elevations and a transfer of flood risk to downstream reaches. Additionally, levee setbacks may cause variable localized, upstream, and downstream outcomes, dependent on the modeling scenario, but levee setbacks are also not currently proposed in any of the project alternatives.

It is acknowledged there is speculation that strengthening certain levee segments and thereby reducing their likelihood of failure may make other levees more susceptible to failure (i.e., the weakest link in the chain may shift). However, there is no evidence that the proposed seepage control treatments would represent an unacceptable transfer of flood risk to adjacent or downstream levee districts. Furthermore, strengthening portions of the Federal project levee system protecting the planning area would not result in any adverse hydraulic effects on other subbasins protected as part of the SRFCP.

4.2.4.2 Water Quality and Groundwater Resources

There is potential for the project to have a cumulative water quality effect as a result of the additional sedimentation from areas where construction would take place. However, it is anticipated that this cumulative increase in sedimentation would be minimal and construction-related BMPs would minimize the sediment loading.

No other currently known projects are expected to have potential groundwater effects that would be cumulatively considerable.

4.2.4.3 Geology, Seismicity, Soils, and Mineral Resources

The FRWLP could result in both beneficial and significant effects on geology, seismicity, and soils. Other earth-moving activities in the affected area, such as development, could change the stability of soils, increase erosion and sedimentation, and expose structures to ground shaking and liquefaction. Soil stability is addressed through engineering design of structures, including levees, and ground-disturbing activities are required to stabilize soils on completion of construction or even between stages of construction. As such, no significant cumulative effects related to soil stability are

anticipated. A cumulative increase in erosion and sedimentation could occur if other levee improvement projects on the Feather River take place at the same time. The potential for erosion and sedimentation resulting from the FRWLP and other projects is limited by minimization measures and implementation of a SWPPP. Any cumulative effect would be temporary and minimal and therefore less than significant. The levee improvement projects replace or upgrade existing flood ~~control~~ risk management facilities (levees), and there would be no change in risks due to seismicity. However, there could be cumulative effects related to construction of structures that could be subject to seismic activity. The affected area is not located in an active seismic area (i.e., no active faults and in an area of relatively low risk of strong ground shaking for California), and therefore any cumulative increase in risk related to ground shaking would be less than significant.

There would be minimal effect on mineral resources and therefore no cumulative effects associated with the levee improvement projects.

4.2.4.4 Traffic, Transportation, and Navigation

Construction activities associated with the FRWLP have the potential to result in short-term disruptions to roadways, including closures, increase in emergency response time, and road hazards; effects on alternative transportation modes; disruption to navigation; and decreases in LOS for roads accessed or used for detours during construction. Combined with other projects in Butte and Sutter Counties and along the Feather River, there could be significant cumulative effects on transportation if the FRWLP and other projects are implemented at the same time. Specifically, cumulative effects would occur if projects required closings or detours on multiple major roadways at the same time, resulting in decreased access to roads in the planning area. Due to the temporary nature of the effects (limited to the construction period) and with implementation of the environmental commitment to use a traffic control and road maintenance plan to ensure minimal overlap in disturbances to traffic during project construction, these effects would be less than significant. No significant cumulative effects would occur.

4.2.4.5 Air Quality

The FRWLP would result in temporary construction-related emissions that would be partially mitigated by reducing vehicle and equipment emissions and implementing a fugitive dust plan. Regardless of the mitigation measures, the temporary construction emissions produced by the FRWLP would be significant and unavoidable on a project-level basis. Other projects occurring in the FRAQMD and BCAQMD jurisdictions at the same time as the FRWLP construction would result in cumulative effects that would be significant, particularly in regards to ROG, NO_X, and PM10 emissions. It is expected that projects generating these pollutants also would minimize emissions through dust control and vehicle emissions control. However, there still could be a significant and unavoidable cumulative effect.

4.2.4.6 Climate Change

Construction activity for the FRWLP, considered on a project-only basis, would cause a temporary and less-than-significant increase in greenhouse gas emissions. However, climate change is a worldwide cumulative effect that is caused by all emission sources throughout California and the world. Therefore, the local effects of climate change in central California will be caused by worldwide GHG emissions rather than local emissions. The State of California, through the AB 32 process, has identified global climate change as a significant and unavoidable issue. However, the

issue is whether this project makes a cumulatively considerable contribution to the impact of climate change.

Assessing net GHG emissions from larger scale projects (e.g., widening floodways, constructing new levees) is difficult because of the potential of such projects to simultaneously increase and reduce GHG emissions. For example, an enlarged or new bypass could place existing agricultural lands within a floodway. Reduced agricultural activity on these lands during the flood season could result in a net reduction in annual GHG emissions relative to existing conditions. However, the need to restore agricultural lands to production after inundation events could require additional energy and fuel not needed for flood-protected agricultural lands, resulting in additional GHG emissions. Therefore, the overall incremental contribution of large-scale long-term management activities to cumulative GHG emissions cannot be ascertained. Because of the uncertainty surrounding these impacts, no determination regarding their significance is provided. Consistent with Section 15145 of the CEQA Guidelines, these impacts are too speculative for evaluation. (California Department of Water Resources 2012:4-32, 33)

4.2.4.7 Noise

Implementation of any of the project alternatives would result in temporary but significant effects related to construction noise and vibration at sensitive receptors in the affected area. Other projects in the vicinity of these receptors occurring at the same time could result in cumulative effects. However, because construction noise would be temporary and highly localized, implementation of project alternatives is not anticipated to make a cumulatively considerable contribution to noise effects in the affected area.

4.2.4.8 Vegetation and Wetlands

Cumulative effects from levee repair would result in permanent loss of vegetation and wetlands. Compensation of lost vegetation and wetlands would mitigate those effects with the goal of no net loss. Levee repairs on other reaches of the Feather River also may result in losses of vegetation and wetlands, and permanent loss could contribute to a significant cumulative effect. However, it is expected that each project would be required to mitigate for such loss thereby reducing any cumulative effect to a less-than-significant level.

4.2.4.9 Wildlife

Construction of the proposed project could result in the injury, mortality, or disturbance of special-status and common species during construction, which could affect local populations. Implementation of mitigation measures identified in this report would minimize or avoid injury, mortality, or disturbance of special-status and common species during construction, and avoid or reduce the project's contribution to cumulative effects on local populations.

The proposed project would result in the permanent and temporary losses of land cover types that provide suitable habitat for special-status and common wildlife species. The loss of these habitats would cumulatively contribute to effects from other projects that remove these habitats in the project region. The Feather River corridor provides important nesting, roosting, foraging, cover, and movement habitat for numerous wildlife species, including several listed and rare species. Construction and maintenance activities from the proposed project would result in the loss of ground squirrel burrows that provide important refuge and nesting habitat for some special-status

wildlife species. The loss of these burrows would cumulatively contribute to the loss of burrow habitat from other construction and levee maintenance activities in the project vicinity. Additional levee improvement projects along the Feather River levee system would result in losses of riparian habitat as a result of construction and/or implementation of USACE's policy regarding levee vegetation (or other future agreed-upon policy). Coordination with USFWS, NMFS, ~~DFG~~CDFW, and appropriate local agencies would be required for such projects to ensure appropriate compensation for effects on riparian habitat. Additionally, many of the listed species affected by the proposed project would be affected by other projects along the Feather River. Because these species are protected under state and Federal laws, other projects also would be required to minimize injury and mortality and compensate for loss of their habitats.

Creation/restoration of riparian forest would occur along the Feather River corridor, within or adjacent to the biological affected area, and would ensure no net loss of riparian forest. Because the greatest threat to most special-status species is the loss of habitat, the permanent loss of habitat from the proposed project together with habitat loss attributable to other projects in the region may be significant.

4.2.4.10 Fish and Aquatic Resources

The project would avoid or minimize losses of riparian vegetation, SRA cover, and seasonal floodplain habitat by restricting ~~most~~ construction activities to areas above the ordinary high water mark on the waterside levee slopes. Thus, the project is not expected to contribute to cumulative effects on aquatic habitat and fisheries resources. Although compensation objectives for this project and similar ongoing and future projects are avoidance or no net loss of existing habitat values, cumulative effects on aquatic habitat and fisheries resources remain significant because of the extensive historical losses of riparian vegetation, SRA cover, and seasonal floodplain habitat in the Central Valley.

4.2.4.11 Agriculture, Land Use, and Socioeconomics

The Sutter County General Plan Draft Environmental Impact Report (DEIR) notes that full buildout of the Sutter County General Plan would result in the loss of 3.3% (9,626 acres) of the important farmland in the county by 2030. This conversion of important farmland to non-agricultural use was determined to be a significant and unavoidable impact, with no feasible mitigation measures (Sutter County 2010b: 6.3-22 to 6.3-23). However, even with full buildout of the General Plan, nearly 87% of the county's acreage will still be designated for agriculture (Sutter County 2010b: 4-7). Conversion of agricultural land in Sutter County would be focused around existing urban centers in growth areas. The agricultural goals and policies of the Sutter County General Plan are designed to preserve agricultural lands to the greatest extent possible as well as to discourage the conversion of agricultural lands to urban uses, as agriculture is vital to the county's economy.

As described in the Butte County General Plan 2030 Draft Environmental Impact Report, full buildout of the Butte County 2030 General Plan would convert approximately 8.3% (4,700 acres) of important farmland to non-agricultural use, resulting in a significant and unavoidable impact (Butte County 2010b: 4.2-9 to 4.2-13). At full buildout condition, agriculture will still be Butte County's primary land use, given the large proportion of agricultural land in the county. The purpose of the Butte County 2030 General Plan Agriculture Element is to protect farmland from urbanization and to enhance the county's agricultural industry (Butte County 2010b: 4.2-11).

Implementation of the FRWLP would permanently convert farmland to nonagricultural use in the direct footprint of the project. However, the FRWLP activities would convert less than one-tenth of a percent of the total important farmland in Sutter and Butte Counties, and the project's contribution toward and in addition to all other planned farmland conversion discussed and analyzed under the County General Plans would range from only 1% for Alternative 3 (149.27 acres plus 14,326 acres under the General Plans) to 6% for Alternative 2 (845.86 acres plus 14,326 acres under the General Plans). As noted in Section 3.11, the conversion of agricultural land to non-agricultural uses would occur only in a narrow corridor adjacent to the existing levee, leaving the remainder of each affected parcel feasible and economically viable for continued farming. Overall, the project is intended to preserve existing land use and socioeconomic conditions, especially for agriculture. Local land use policies and the collective regional perspective are aimed to maintain agriculture as a viable, sustainable, and thriving industry to drive the local economy. Municipal general plans call for the protection of agriculture and maintaining its compatibility with other land uses, and the FRWLP is consistent with those goals. Therefore, the FRWLP would contribute to the cumulative conversion of agricultural land to non-agricultural uses in Sutter and Butte counties, but at a less-than-significant level.

Potential FRWLP conflicts with zoning, land use plans, policies, or regulations would be the same under cumulative conditions as described in Section 3.11, Effect AG-3, *Conflict with Existing Zoning for Agricultural Use*, and Effect LU-1, *Conflict with Applicable Land Use Plan, Policy, or Regulation*. The FRWLP is not expected to contribute to cumulative land use regulatory compatibility impacts.

Construction activities associated with the FRWLP would contribute to a temporary, local increase in employment and personal income. However, implementation of the proposed FRWLP is not anticipated to significantly contribute to long-term cumulative changes in employment region-wide.

4.2.4.12 Population, Housing, and Environmental Justice

While the FRWLP would not displace a substantial number of people or existing housing units nor necessitate the construction of replacement housing elsewhere, other projects may displace housing in the same census tracts, which could result in a significant cumulative effect. However, acquisition of any residences for the FRWLP and other projects would comply with the policies and provisions set forth in the Uniform Act and implementing regulation, Title 49 CFR Part 24, and be in accordance with the California Government Code Section 7267, et seq. Therefore, implementation of the FRWLP considered cumulatively with other projects is not expected to result in a significant cumulative effect related to home acquisitions.

The FRWLP would potentially result in significant and unavoidable effects related to disproportionately high and adverse effects on minority populations and low-income populations from temporary construction activities for air quality, noise, and visual resources under Alternative 2. Construction activities for other projects that result in air quality, noise, and visual impacts in the affected area could also result in significant cumulative effects. The FRWLP could contribute to a cumulatively considerable effect.

The FRWLP alternatives would not result in disproportionately high and adverse effects on minority populations and low-income populations from acquisition of homes because plenty of vacant homes exist within the affected area to serve as replacement housing. Existing state and federal laws require relocation advisory services, replacement housing, and compensation for living expenses, which further offset effects associated with acquisition of homes. The Relocation Assistance and Real

Property Acquisition Guidelines were designed to ensure that uniform, fair, and equitable treatment is given to people displaced from their homes as a result of the actions of a public entity. Although other projects could also require the acquisition of homes in the same census tracts, implementation of FRWLP, considered cumulatively with other projects, is not expected to result in a significant cumulative effect.

4.2.4.13 Visual Resources

The FRWLP would potentially result in significant and unavoidable visual effects in reaches with sensitive viewers for one or more project alternatives. The effect mechanisms are primarily vegetation removal and replacement of agricultural and developed land use with seepage berms. As other projects to achieve flood risk reduction in the region are implemented, these effects would be additive and could be cumulatively significant and unavoidable.

4.2.4.14 Recreation

The FRWLP would not result in any significant or beneficial effects on recreation and consequently would not contribute to any cumulative recreation effects in the planning area.

4.2.4.15 Utilities and Public Services

Construction of the project may damage drainage and irrigation systems and public utility infrastructure, resulting in temporary disruptions to service. Coordination with drainage and irrigation system users, consultation with service providers, and implementation of appropriate protection measures would minimize the possibility of any significant effects. Because utility and public service system effects would be isolated, temporary, and fully mitigated, the project would not result in a cumulatively considerable incremental contribution to a cumulatively significant effect.

4.2.4.16 Public Health and Environmental Hazards

The project has the potential to slightly increase risks to the public during construction through use of equipment and fuels, but the increased risk is temporary. These risks are minimized through implementation of the SWPPP and other BMPs described for Mitigation Measures PH-MM-1 through PH-MM-4 in Section 3.16, *Public Health and Environmental Hazards*. Because these are standard practice for construction projects, it is expected that the overall cumulative effect would not be adverse.

The FRWLP would improve ~~flood protection~~level of performance for the planning area. The Sutter Basin Project is expected to propose flood management improvements that would further improve ~~flood protection~~level of performance in the planning area, and other projects that reduce stress on the Sutter Basin levees could result in a beneficial cumulative effect in the planning area by reducing the overall public risk associated with levee failure.

4.2.4.17 Cultural Resources

Because individual cultural resources occur in discrete, relatively small, and geographically bounded areas, they typically are not subject to cumulative effects. Environmental resources like air quality and water quality that occur in more expansive locations (e.g., air basins and river systems) are more likely to be affected cumulatively because more than one project on the list could contribute to

the degradation of the resource. However, the combined set of actions that form the cumulative context for the FRWLP, and its extent, are expected to result in significant and unavoidable effects on cultural resources and in an ongoing loss of such resources. Because the project alternatives each would result in significant and unavoidable effect on cultural resources, they would make a significant contribution to this cumulative effect. While mitigation is identified for the project alternatives, this mitigation does not reduce the contribution of the project alternatives to less than significant. For these reasons, this effect may be cumulatively significant and unavoidable.

Rural historic landscapes may span large enough areas to be subject to cumulative effects. Such landscapes typically contain multiple contributing elements associated with the historic themes that give the landscape significance. For example, reclaimed agricultural landscapes may have multiple elements, such as drainage systems, road systems, and landscape patterns (Dames and Moore 1996). Because these landscapes span large areas, individual projects each may contribute to a loss of the resource's integrity that ultimately results in a complete loss of the ability of the resource to convey its significance. The FRWLP would alter the features of the Feather River West Levee and also would require the use and operation of borrow sites. These improvements may result in the demolition of individual structures and residences that contribute to rural historic landscapes. Other projects that form the cumulative context may contribute to these effects through plan build-out, levee repair, or other actions requiring demolition of structures forming portions of rural historic landscapes also affected by the FRWLP. For these reasons, the FRWLP may contribute to cumulatively significant and unavoidable effects on rural historic landscapes.

Chapter 5

Compliance with Environmental Laws and Regulations

5.1 Federal Requirements

Many of the requirements of the Federal government are codified under the USC as described below. Where a more common name for a law or regulation is typically used, it is listed by that name with a reference to the corresponding USC section.

National Environmental Policy Act (42 USC 4321, et seq.)

~~*Partial* *Full* *Compliance.* This ~~Draft~~ Final EIS~~/EIR~~ ~~partly~~incorporates public comments, as appropriate and fulfills requirements of NEPA. ~~After a public review period, the Final EIS/EIR will incorporate public comments, as appropriate~~.

River and Harbors Appropriation Act of 1899

~~*Partial* *Full* *Compliance.* Under Section 14 of the Rivers and Harbors Appropriation Act (33 USC 408, commonly referred to as Section 408), temporary or permanent alteration, occupation, or use of any public works, including levees, for any purpose is only allowable with the permission of the Secretary of the Army. Under the terms of 33 USC 408, any proposed levee modification requires a determination by the Secretary that the proposed alteration, permanent occupation, or use of a Federal project is not injurious to the public interest and will not impair the usefulness of the levee. The authority to make this determination and approve modifications to Federal works under 33 USC 408 has been delegated to the Chief of Engineers, USACE. The CVFPB is requesting Section 408 permission from USACE for the FRWLP on behalf of SBFCA. ~~USACE is also reviewing the FRWLP for~~ Section 10 of the Rivers and Harbors Appropriation Act for effects on navigability, coincident with review under Clean Water Act, Section 404 (discussed below) is not applicable for the FRWLP because there is no work in navigable waters. To ensure that the proposed project is in full compliance, ESA compliance with USFWS and NMFS~~,~~ and Section 106 compliance with SHPO has been completed (discussed below). In addition, USFWS has developed a Coordination Act Report (CAR), with input from NMFS and CDFW (discussed below).

Clean Water Act (33 USC 1251 et seq.)

~~*Partial* *Full* *Compliance*. USACE and SBFCA will ensure that the project complies with the CWA, including Sections 404, 401, and 402. Some placement of fill within jurisdictional wetlands and waters of the United States is required for the project, under USACE jurisdiction for Section 404. This is detailed in Section 3.8, *Vegetation and Wetlands.* To ensure that the proposed project is in full compliance, SBFCA has coordinated with USACE Regulatory Division on 404 permitting requirements and the proposed project appears to qualify within the Nationwide Permit Program. A Wetland Delineation was submitted to USACE and a preliminary jurisdictional determination (PJD) pursuant to Regulatory Guidance Letter 08-02 of the wetlands and other waters delineated within the corridor has been issued. ~~will submit an application to USACE for a Section 404 permit~~

A Section 401 State Water Quality Certification for activities associated with implementation of the proposed project is required as a condition of Section 404, and SBFCA ~~will~~ has submitted a 401

certification application to the RWQCB for Contract C. The project ~~would~~ also requires an NPDES 402 permit, through the development of a SWPPP because the project would disturb more than 1 acre of ground, which has been completed for Contract C. Water quality issues are discussed in Section 3.2, *Water Quality and Groundwater Resources*.

Clean Air Act (42 USC 1857, et seq.), as amended and recodified (42 USC 7401, et seq.)

~~*Partial*~~ *Full Compliance.* The project construction falls under the jurisdiction of the BCAQMD and FRAQMD. The districts determine whether project emission levels significantly affect air quality, based on Federal standards established by EPA and ARB. ~~The districts would first issue a permit to construct, followed by a permit to operate, which would be evaluated to determine whether all facilities have been constructed in accordance with the authority to construct permit.~~ USACE and SBFCA have determined that emissions associated with the APA are below the applicable General Conformity *de minimis* thresholds and that General Conformity requirements have been met, as required by the federal Clean Air Act. Because the project satisfies General Conformity requirements, it has been determined ~~prepared a draft conformity analysis and are in coordination with the districts to determine that~~ the project would not cause or contribute to a new violation of any air quality standard, increase the frequency or severity of any existing violation of any air quality standard; or delay the timely attainment of any standard or any interim emissions reductions or other milestones in any area. Consequently, the project would have no significant effects on the future air quality of the area and is in compliance with this act. Air quality analysis is presented in Section 3.5, *Air Quality*.

Executive Order 11990, Protection of Wetlands

~~*Partial*~~ *Full Compliance*. This order directs USACE to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in implementing Civil Works projects. The project has been designed to avoid and minimize effects on wetlands, and all wetland effects would be compensated. Permitting under CWA Section 404 for wetlands is in progress. Analysis of wetlands is presented in Section 3.8, *Vegetation and Wetlands*.

Endangered Species Act (16 USC 1531, et seq.)

~~*Partial*~~ *Full Compliance*. Section 7 of the ESA requires Federal agencies, in consultation with USFWS and NMFS, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or significant modification of the critical habitat of these species.

To ensure that the proposed project is in full compliance, USACE ~~is coordinating~~ initiated formal consultation with USFWS and NMFS. USFWS issued a biological opinion (08ESMF00-2013-F-0342-1) on May 2, 2013 for effects to giant garter snake and valley elderberry longhorn beetle. NMFS issued a not likely to adversely affect letter on April 17, 2013, concurring with the USACE determination. The BO and concurrence letter are included in Appendix F. ~~to determine consultation and documentation needs.~~ Also, discussions of Federal listed species have been included in Section 3.9, *Wildlife*, and 3.10, *Fish and Aquatic Resources*, of this EIS/EIR.

Fish and Wildlife Coordination Act of 1958, as amended (16 USC 661, et seq.)

~~*Partial* *Full*~~ *Compliance.* This act requires Federal agencies to consult with USFWS, NMFS, and ~~DFG~~CDFW before undertaking projects that control or modify surface water. The consultation is intended to promote conservation of wildlife resources by preventing loss of or damage to fish and wildlife, and to provide for the development and improvement of these resources in connection with water projects. USFWS, NMFS, and ~~DFG~~CDFW are authorized to conduct surveys and investigations to determine the potential damages and the measures required to prevent losses. Recommendations of USFWS, NMFS, and ~~DFG~~CDFW are typically integrated into reports seeking permission to construct a project or to modify plans for previously authorized projects. This act requires USACE to incorporate justifiable means for the benefit of wildlife that should be adopted to obtain maximum overall project benefits. USFWS ~~is~~ has ~~developing~~ developed a ~~Coordination Act Report (~~CAR~~)~~, with input from NMFS and ~~DFG~~CDFW that is included ~~as a~~in Appendix F. ~~USACE has and will continue to maintain coordination and communication with USFWS, NMFS, and DFGCDFW. The CAR will be considered in development of the Final EIS/EIR and the Record of Decision.~~ Effects on wildlife and fish are described in Section 3.9, *Wildlife*, and 3.10, *Fish and Aquatic Resources*, of this EIS/EIR.

Migratory Bird Treaty Act of 1936, as amended (16 USC 703, et seq.)

~~*Partial* *Full*~~ *Compliance.* The MBTA implements various treaties and conventions between the United States, Canada, Japan, Mexico, and Russia, providing protection for migratory birds as defined in 16 USC 715j. Most effects resulting from the proposed project are anticipated to be short-term direct disturbances to migratory birds, which would likely temporarily avoid the construction area. USACE is in communication with USFWS via ESA consultation and development of the CAR to ensure that the proposed project does not significantly affect migratory birds; coordination with ~~DFG~~CDFW is also in progress. Effects on avian species are described in Section 3.9, *Wildlife*.

Magnuson-Stevens Fishery Conservation and Management Act

~~*Partial* *Full*~~ *Compliance.* The Magnuson-Stevens Act establishes a management system for national marine and estuarine fishery resources. This legislation requires that all Federal agencies consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect EFH. Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must also be considered. The Magnuson-Stevens Act states that consultation regarding essential fish habitat should be consolidated, where appropriate, with the interagency consultation, coordination, and environmental review procedures required by other Federal statutes, such as NEPA, Fish and Wildlife Coordination Act, CWA, and ESA. NMFS issued a letter on April 17, 2013, that concurred with the USACE determination that the proposed project will not adversely affect EFH of Pacific salmon and thus fulfills the Magnuson-Stevens Act. The NMFS concurrence letter is included in Appendix F. ~~USACE and NMFS are in coordination to determine the EFH compliance documentation appropriate for the FRWLP.~~ Additional description of the act is found in Section 3.10, *Fish and Aquatic Resources*.

Farmland Protection Policy Act (7 USC 4201, et seq.)

~~*Partial* *Full*~~ *Compliance*. The FPPA is regulated by NRCS. The purpose of this act is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to ensure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with state, unit of local government, and

private programs and policies to protect farmland. NRCS is authorized to review Federal projects to determine whether a project is regulated under the act and establish the farmland conversion impact rating for the project. Coordination with NRCS under the FPPA is ~~in progress~~complete, as discussed in Section 3.11, *Agriculture, Land Use, and Socioeconomics*.

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

Full Compliance. The order requires all Federal agencies to identify and address, as appropriate, disproportionately high and significant human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Anticipated effects from the proposed project were reviewed to determine whether low-income or minority neighborhoods would be disproportionately affected by the proposed project. No effects associated with environmental justice or social equity are anticipated as a result of the project, as discussed in Section 3.12, *Population, Housing, and Environmental Justice*.

National Historic Preservation Act of 1966, as amended (16 USC 470, et seq.)

~~*Partial*~~ *Full Compliance.* The NHPA requires Federal agencies to take into account the effects of Federal undertakings on historic properties. Section 106 of the NHPA describes the process for identifying and evaluating historic properties; for assessing the effects of Federal actions on historic properties; and for consulting to avoid, reduce, or minimize significant effects. The term *historic properties* refers to cultural resources that meet specific criteria for eligibility for listing on the NRHP. This process does not require historic properties to be preserved but does ensure that the decisions of Federal agencies concerning the treatment of these places result from meaningful consideration of cultural and historic values and the options available to protect the properties.

Under these requirements, the APE of the selected project is inventoried and evaluated to identify historical, archeological, or traditional cultural properties that have been placed on the NRHP and those that the agency and SHPO agree are eligible for listing on the NRHP. If the project is determined to have an effect on such properties, the agency must consult with SHPO and the Advisory Council on Historic Preservation (ACHP) to develop alternatives or mitigation measures. Compliance with these and other provisions of the NHPA is required as a process separate from, but concurrent with, NEPA.

The evaluation of cultural resources presented in this EIS/EIR complies with the NHPA. Research (literature and archival research) and field surveys in the APE are summarized in Section 3.17, *Cultural Resources*. USACE has prepared a ~~draft~~ PA to provide guidelines for compliance with the Section 106 process when the effects on historic properties are unknown, ~~under review by SHPO~~that has been approved by SHPO and is now ready for signature by all parties. The unsigned version of the PA is included as Appendix J.

Ongoing coordination and communication will be maintained by USACE with signatories, concurring parties, and other key stakeholders as planned follow-on efforts are undertaken and the proposed project proceeds. By carrying out the terms of the PA, USACE will have fulfilled its responsibilities under Section 106 of the NHPA and ACHP regulations. This would constitute full compliance with this act.

Executive Order 11988, Floodplain Management

Full Compliance. This Executive Order requires USACE to provide leadership and take action to (1) avoid development in the base (1-in-100 annual event) floodplain (unless such development is the only practicable alternative); (2) reduce the hazards and risk associated with floods; (3) minimize the effect of floods on human safety, health, and welfare; and (4) restore and preserve the natural and beneficial values of the base floodplain.

To comply with this Executive Order, the policy of USACE is to formulate projects which, to the extent possible, avoid or minimize significant effects associated with use of the without-project flood plain, and avoid inducing development in the existing flood plain unless there is no practicable alternative. None of the remediation measures proposed as part of the FRWLP would induce development within the floodplain. The project would provide increased stability to existing levees in selected areas that have been determined to require reinforcement. This would decrease the risk of flooding and hazards associated with floods. It would not create development in the base floodplain but would preserve the natural and beneficial values associated with the present agricultural uses. A more complete discussion is provided in Chapter 4, *Growth Inducing and Cumulative Effects*.

Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance

Full Compliance. Executive Order 13514 requires Federal agencies to set a 2020 GHG emissions reduction target within 90 days; increase energy efficiency, reduce fleet petroleum consumption, conserve water, and reduce waste; support sustainable communities; and leverage Federal purchasing power to promote environmentally responsible products and technologies. USACE is requiring lower emission-producing equipment for use in construction and electric batch plants.

Wild and Scenic River Act (16 USC 1271, et seq.)

Full Compliance. The proposed project complies with this act as no river segments designated as wild and scenic exist in the project area.

5.2 State Requirements

Many of the requirements of the State of California are codified under the PRC as described below. Where a more common name for a law or regulation is typically used, it is listed by that name with a reference to the corresponding PRC section.

California Environmental Quality Act (PRC, Section 21000, et seq.)

~~*Partial*~~ *Full compliance*. The act requires SBFCA to disclo~~se~~sure ~~of~~ environmental effects, alternatives, potential mitigation, and environmental compliance of the proposed project. SBFCA has certified and adopted its final EIR and filed ~~This document will b~~has be~~en~~ ~~certified and adopted and~~a Notice of Determination ~~will be filed upon finalization~~.

Porter-Cologne Water Quality Control Act

~~*Partial*~~ *Full Compliance*. The State Water Resources Control Board reviews certain water activities throughout California with delegated authority to regional boards for water quality. The FRWLP is under the jurisdiction of the Central Valley RWQCB. The boards administer the requirements mandated by state law and Federal law responsibilities delegated to the state (including the Porter-Cologne Water Quality Control Act and elements of the Clean Water Act, respectively). RWQCB establishes water quality standards and reviews individual projects for compliance with the standards. SBFCA ~~will~~ has submitted a 401 certification application for the first phase of the project (Contract C) scheduled to begin construction in 2013 as described above under CWA Section 404. Water quality effects are described in Section 3.2, *Water Quality and Groundwater Resources*.

Surface Mining and Reclamation Act of 1975 (PRC, Section 2710, et seq.)

~~*Partial*~~ *Full Compliance.* The State Mining and Geology Board oversees the implementation of relevant state laws and regulations. One of the laws within its jurisdiction is the Surface Mining and Reclamation Act of 1975 (SMARA). SMARA requires that an entity seeking to conduct a surface-mining operation obtain a permit from and submit a reclamation plan to the lead agency overseeing that operation. To be adequate, the reclamation plan must contain all categories of information specified in the SMARA. SMARA compliance is in progress for applicable soil borrow areas, led by SBFCA. Section 3.3 describes effects on mineral resources.

California Streets and Highways Code (Section 660)

~~*Partial*~~ *Full Compliance*. Caltrans is responsible for ensuring the safety and integrity of the State of California's highway system. Under California law, any encroachment on a state route must be approved by Caltrans. SBFCA is leading coordination with Caltrans for any construction permitting. Effects on roadways are presented in Section 3.4, *Traffic, Transportation, and Navigation*.

California Clean Air Act of 1988

~~*Partial*~~ *Full Compliance.* As discussed above under the Federal Clean Air Act, the BCAQMD and FRAQMD determine whether project emission sources and emission levels significantly affect air quality based on Federal standards established by EPA and state standards set by ARB. The project is in compliance with all provisions of Federal and state Clean Air Acts. USACE and SBFCA have prepared a draft conformity analysis and are in coordination with the districts to determine that the project would have no significant effects on the future air quality of the area and is in compliance with this act. Air quality analysis is presented in Section 3.5, *Air Quality*.

California Fish and Game Code (Section 1600, et seq.)

~~*Partial*~~ *Full Compliance*. Under Sections 1600–1616 of the California Fish and Game Code, ~~DFG~~CDFW regulates activities that would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed that falls under ~~DFG~~CDFW jurisdiction. In practice, ~~DFG~~CDFW marks its jurisdictional limit at the top of the stream or lake bank, or the outer edge of the riparian vegetation, where present, and sometimes defines its jurisdiction based on the levee crown within leveed river systems. Notification is required prior to any such activities and ~~DFG~~CDFW will issue an agreement with any necessary mitigation to ensure protection of the state's fish and wildlife resources. SBFCA is coordinating a Streambed Alteration Agreement with ~~DFG~~CDFW for the first phase of the project

(Contract C) scheduled to begin construction in 2013. Effects on riparian habitat are described in Section 3.8, *Vegetation and Wetlands*.

California Endangered Species Act of 1984

~~Partial~~ Full Compliance. ~~DFG~~CDFW administers this act, which requires non-Federal lead agencies to prepare documentation if a project may significantly affect one or more state-listed endangered species. Federal agencies are not subject to the state Endangered Species Act. SBFCA is leading coordination with ~~DFG~~CDFW, and species effects are discussed in Sections 3.9, *Wildlife*, and 3.10, *Fish and Aquatic Resources*.

California Land Conservation Act of 1965 (Williamson Act)

Full Compliance. The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is a state policy administered at the local government level. The Williamson Act is intended to preserve agricultural and open space lands through contracts with private landowners. By entering into a Williamson Act contract, the landowner foregoes the possibility of converting agricultural land to non-agricultural use for a rolling period of 10 years in return for lower property taxes. The Williamson Act was amended in August 1998 to establish Farmland Security Zones. In return for a 20-year contract commitment, property owners are granted greater tax reductions. Neither Sutter County nor Butte County currently participates in the Farmland Security Zone program. As discussed in Section 3.11, *Agriculture, Land Use, and Socioeconomics*, no lands under Williamson Act protection would be affected in Sutter County and no further action is required. In Butte County, there are 67.65 acres of Williamson Act lands that would be affected by SBFCA's adopted alternative, which is considered less than significant as described in Section 3.11.3.4. ~~will be responsible for addressing any Williamson Act issues in Butte County and is in the process of determining any Williamson Act triggers.~~

PRC, Section 6301, et seq. (Administration and Control of Swamp, Overflowed, Tide, or Submerged Lands)

Full Compliance. In addition to such state-owned lands as parks and state highways, the State Lands Commission has exclusive jurisdiction over all ungranted tidelands and submerged lands owned by the state and the beds of navigable rivers, sloughs, and lakes (PRC, Section 6301). State ownership extends to lands lying below the ordinary high-water mark of tidal waterways and below the low-water mark of nontidal waterways (Civil Code, Section 830). The area between the ordinary high and low water on nontidal waterways is subject to a "public trust easement." Projects such as bridges, transmission lines, and pipelines fall into this category. A proposed project cannot use these state lands unless a lease is first obtained from the State Lands Commission. The Commission also issues separate permits for dredging. For this proposed project, no state lands have been identified that require State Lands Commission review and approval.

5.3 Local Plans and Policies

This section discusses the degree to which individual project components comply with locally adopted plans and policies. Evaluating the level of compliance with locally adopted plans can be complicated due to the following: (1) the intentionally broad and unspecific goals articulated in local general plans; (2) the potential of a Federal project to influence the location, density, and rate of development in ways that differ from existing local plans and policies; and (3) the currency of local

plans. The proposed project is located within the jurisdiction of the General Plans of Sutter and Butte Counties and Cities of Yuba City, Live Oak, and Gridley. A listing of potentially applicable local plans and policies is provided in Appendix A. As the applicant and non-Federal lead agency, SBFCA would ensure, to the extent practicable, that the project complies with the provisions of all relevant local plans.

Chapter 6
Consultation and Coordination

6.1 Introduction

This chapter contains a summary of the FRWLP consultation and coordination activities that have occurred in support of the FRWLP.

6.2 Public Scoping/Hearings

In June 2011, four scoping meetings were held jointly for the FRWLP and the Sutter Basin Feasibility Study. Because the two projects are being studied in close coordination, a joint scoping process was conducted to explain the relationship between the two efforts and obtain public input in a manner that is convenient, efficient, and integrated. The meetings were held to educate the public about each of the two efforts and to garner input on the proposed scope of each, in accordance with NEPA and CEQA.

The meetings were held at two different times over the course of ~~two~~ 2 days. On June 27, 2011, two meetings were held; one from 3:30 to 5:30 p.m. and another from 6:30 to 8:30 p.m. Both were at the Yuba City Veterans Memorial Community Center. On June 28, 2011, two meetings were held; one from 3:30 to 5:30 p.m. and another from 6:30 to 8:30 p.m. Both were at the Gridley Veterans Memorial Hall.

The meeting locations were chosen as they are central to the region. The meeting times were chosen to accommodate both the work day schedules of public agency representatives and the general public, including residents and business owners.

The meetings were open-house style workshops in which attendees could read and view the information about the two projects and interact with project staff including SBFCA, USACE, DWR, and engineering and environmental consultants.

For more detail on comments received, information available at the meetings, and a summary of key issues that were raised, see Appendix B.

In January 2013, three hearings were held to receive public comment on the FRWLP Draft EIS/EIR that was published in December 2012. Thirty-one individuals attended the meeting in Gridley on January 15, of whom 13 individuals provided verbal comment. In Yuba City on January 16, 41 individuals attended the 3:00–5:00pm meeting, of whom seven individuals providing verbal comment. The 6:00–8:00pm meeting on the same day in Yuba City had 25 attendees, and 16 of those provided verbal comment. The transcripts from the public hearings can be found in Part II, Chapter 5 of the Final EIS/EIR.~~A similar approach will be used when the public draft EIS/EIR is available for review.~~ USACE will ensure all agencies, organization, and individuals who provided comments on the Draft EIS/EIR will be provided a copy of the Final EIS.

6.3 Agency Consultation and Coordination

Beyond formal public scoping, USACE and SBFCA have been in communication with Federal, state, and local agencies in the course of project planning, design development, and preparation of the EIS/EIR. These communications have taken form via in-person meetings, telephone conversations, and written correspondence. The purpose of the communications included consistency with other planning studies and projects in the region, pursuit of agency approvals, seeking information to be considered in the document, and exploring opportunities for partnership.

Beginning in June 2012, numerous meetings were held between staff from USACE Sacramento District, USFWS, and SBFCA to discuss various issues including scope of service, Coordination Act Report, Section 7 consultation, potential mitigation, and compliance strategy. USACE also sent numerous electronic mail messages to the USFWS transmitting important information including the USFWS Scope of Work, Civil Works project funding, and acreage impacts. An onsite field tour of the entire project area was also held in July 2012 that was attended by USFWS staff and other agency staff, including USACE, ~~DFG~~CDFW, DWR, CVFPB, and SBFCA. Communication with Caltrans also occurred during this time.

Agency communication will continue through approvals and monitoring of permit conditions.

6.4 Other Communication

Beyond agency coordination, USACE and SBFCA were in communication with Native Americans, environmental non-governmental organizations (NGOs), and other interested stakeholders. Correspondence was received from Mooretown Rancheria and Enterprise Rancheria in response to a written inquiry from USACE based on NAHC coordination (described in 3.17). A comprehensive mailing list that includes the 27,000 property owners of the 34,200 properties in the Sutter Basin ~~will~~ was utilized to share information regarding the project as it moves forward, including a newsletter announcing the availability of the public draft EIS/EIR and public meetings.~~SBFCA will be increasing outreach to all of these groups prior to release of the public draft EIS/EIR, to facilitate support for the project through an inclusive process.~~

Chapter 7
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Chapter 8
List of Preparers

This EIS/EIR was prepared by ICF International at the direction of USACE and SBFCA. The following individuals participated in the preparation of this document.

8.1 ICF International

Name	Education/Experience	Contribution/Role
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Jennifer Rogers	B.A. Journalism; 8 years experience	Project Coordinator
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Jody Job	34 years experience	Publications Specialist
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8.2 U.S. Army Corps of Engineers

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8.3 Sutter Butte Flood Control Agency

Name	Education/Experience	Contribution/Role
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Michael Bessette	Director of Engineering B.S. Civil Engineering 22 years experience	Agency Reviewer

8.4 Other Contributors

Name	Education/Experience	Contribution/Role
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Dave Peterson	PBI M.S. Civil Engineering 30 years experience	Coordinator for Sutter Basin Project
Andrea Clark	Downey Brand Environment Science , J.D 9 years experience	Legal Counsel on behalf of SBFCA
Chris Krivanec	HDR M.S. Civil (Geotechnical) Engineering 20 years experience	Project Description Review and Analytical Input
Jonathon Kors	Wood Rogers B.S. Civil Engineering 15 years experience	Project Description Review and Analytical Input
Daniel Jabbour	HDR B.S. Civil Engineering 13 years experience	Analytical Input
Dawn LoBaugh	HDR M.S. Environmental Sciences; 10 years experience	Wildlife Resource Specialist; authored USFWS Biological Assessment and provided agency coordination
Jeannette Owen	HDR B.S. Environmental Biology & Ecology; 17 years experience	Authored Environmental Consequences material of Vegetation and Wetlands section
Patty Hardesty	HDR B.S. Conservation Biology; 10 years experience	Conducted delineation of wetlands and other waters
Scott Tidball	HDR B.A. Environmental Studies; 1 year experience	Provided GIS expertise for wetlands and other waters delineation and USFWS Biological Assessment
Adrian Pitts	HDR B.S. Biological Sciences; 15 years experience	Fish and Aquatics Resource Specialist
Jelica Arsenijevic	B.S. Marine Coastal Ecology; 11 years experience	Authored USFWS Biological Assessment

Chapter 9
Recipients

9.1 Government Departments and Agencies

9.1.1 Federal Agencies

Bureau of Indian Affairs, Pacific Regional Office, Sacramento, CA
Bureau of Land Management, Sacramento, CA
Bureau of Reclamation, Mid-Pacific Region, Sacramento, CA
Department of Agriculture, Animal and Plant Health and Inspection Service, Sacramento, CA
Department of Agriculture, Farm Service Agency, Washington, DC
Department of Agriculture, National Institute of Food and Agriculture, Washington, DC
Department of Agriculture, Natural Resources Conservation Service, Oroville, CA
Department of Agriculture, Natural Resources Conservation Service, Washington, DC
Department of Agriculture, Natural Resources Conservation Service, Yuba City, CA
Department of Defense, Navy, Washington, DC
Department of Defense, U.S. Marine Corps, Washington, DC
Department of Energy, Washington, DC
Department of Health and Human Services, Americans with Disabilities Act, Washington, DC
Department of Health and Human Services, Centers for Disease Control and Prevention, Atlanta, GA
Department of Health and Human Services, Office of the Secretary, Washington, DC
Department of Homeland Security, Washington, DC
Department of Housing and Urban Development, Region IX, San Francisco, CA
Department of the Interior, Washington, DC*
Department of the Treasury, Washington, DC
Department of Veterans Affairs, Washington, DC
Environmental Protection Agency (via e-filing)
Environmental Protection Agency Region 9, San Francisco, CA*
Federal Aviation Administration, Flight Standards District Office, Sacramento, CA
Federal Emergency Management Agency, Region IX, Oakland, CA
Federal Highway Administration, California Division, Sacramento, CA
Fish and Wildlife Service, Sacramento Fish and Wildlife Office – Sacramento, CA
Fish and Wildlife Service, Sacramento River National Wildlife Refuge Complex-Willows, CA
General Services Administration, Washington, DC
Geological Survey, Menlo Park, CA
National Marine Fisheries Service, Central Valley Office-Sacramento, CA
National Marine Fisheries Service, Southwest Regional Office-Long Beach, CA*
National Park Service, San Francisco, CA
National Science Foundation, Arlington, VA

* Please see Part II of this Final EIS/EIR for their comment letter.
** Signatory to the NGO letters.

9.1.2 Native American Contacts

Berry Creek Rancheria of Maidu Indians
Butte Tribal Council
Cachil DeHe Band of Wintun Indians (Colusa Rancheria)
Cortina Indian Rancheria of Wintun Indians
Enterprise Rancheria of Maidu Indians
Greenville Rancheria of Maidu Indians
KonKow Valley Band of Maidu
Maidu Cultural and Development Group
Maidu Nation
Maidu/Konkow
Mechoopda Indian Tribe of Chico Rancheria
Mooretown Rancheria of Maidu Indians
National Congress of American Indians
National Tribal Environmental council
Paskenta Band of Nomlaki Indians of California
Strawberry Valley Rancheria
Tsi-Akim Maidu
United Auburn Indian Community of the Auburn Rancheria*

9.1.3 State Agencies

California Air Resources Board
California Department of Conservation
California Department of Fish and ~~Game~~Wildlife, North Central Region*
California Department of Parks and Recreation, Northern Butte District
California Department of Transportation, District 3
California Department of Water Resources*
California Environmental Protection Agency
California Farm Bureau Federation
California Natural Resources Agency
Central Valley Flood Protection Board
Central Valley Regional Water Quality Control Board
Environmental Council of the States
National Association of Attorneys General
National Conference of State Legislatures
Office of Historic Preservation
Office of Planning and Research
State Lands Commission, Environmental Management Division*
The California Central Valley Flood Control Association
The Northern California Water Association

* Please see Part II of this Final EIS/EIR for their comment letter.
** Signatory to the NGO letters.

9.1.4 Elected Officials

Honorable Barbara Boxer, U.S. Senator
Honorable Dianne Feinstein, U.S. Senator
Honorable Wally Herger, U.S. Congressman, District 2
Honorable Doug Lamalfa, California State Senator, District 4
Honorable Jim Nielsen, California Assembly member, District 2

9.1.5 Regional, County, and City

Butte County Air Quality Management District
Butte County Board of Supervisors
Butte County Clerk/Recorder
Butte County Department of Development Services
Butte County Library—Main Branch, Oroville, CA
Butte Environmental Council
City of Biggs Branch Library
City of Biggs City Council
City of Biggs Planning Department
City of Gridley City Council
City of Gridley Planning Department
City of Live Oak City Council
City of Live Oak Planning Department
City of Marysville City Council
City of Marysville Planning Department
City of Yuba City City Council
City of Yuba City Community Development
Feather River Air Quality Management District
Gridley Branch Library
Levee District 1
Levee District 3
Levee District 9
Maintenance Area 16
Maintenance Area 7
Sacramento Area Flood Control Agency
Sutter Butte Flood Control Agency
Sutter Butte Flood Control Agency Board of Directors
Sutter County Board of Supervisors
Sutter County Clerk/Recorder
Sutter County Library—Main Branch, Yuba City, CA

* Please see Part II of this Final EIS/EIR for their comment letter.
** Signatory to the NGO letters.

Sutter County Planning Services
Sutter County Public Works Department
Sutter County RCD
Three Rivers Levee Improvement Authority
West Sacramento Area Flood Control Agency
Yuba County Planning Department
Yuba-Sutter Farm Bureau

9.2 Other Interested Parties

Alliance for Nuclear Accountability
American Bird Conservancy
American Federation of Labor and Congress of Industrial Organizations
American Lung Association
American Recreation Coalition
American Rivers*, **
American Whitewater**
Audubon California**
California Trout**
California Waterfowl Association**
Center for Biological Diversity
Clean Water Action
Ducks Unlimited
Defenders of Wildlife**
Earth Justice
Edison Electric Institute
Environment America
Environmental Defense Fund
Environmental Defense Institute
Family Water Alliance
Friends of the Earth
Friends of the River**
GRACE
Institute for Science and International Security
League of Women Voters
Local Media Representatives
National Audubon Society
National Wildlife Federation
Natural Resources Defense Council **
Pacific Gas & Electric Company*
Partners in Flight
Planning and Conservation League**

* Please see Part II of this Final EIS/EIR for their comment letter.
** Signatory to the NGO letters.

Responsible Environmental Action League
Sacramento River Preservation Trust**
Sacramento Valley Landowners Association
Sierra Club
South Yuba River Citizens League**
The Bay Institute**
The Nature Conservancy
The Partnership Project
The Wilderness Society
Trout Unlimited**

9.3 Members of the Public

All members of the general public who requested a copy of the Draft EIS/EIR, or who provided comments on the Draft EIS/EIR, will be mailed either an electronic version (on CD) or a hard copy of the document. Additionally, those who submitted comments during the scoping process, spoke or submitted comment cards at public meetings, and provided complete mailing addresses and those who may be affected by the proposed project will also receive a copy of the Draft EIS/EIR. Comment letters, electronic mail messages, and comment cards submitted by the public can be found in Part II of this Final EIS.

* Please see Part II of this Final EIS/EIR for their comment letter.
** Signatory to the NGO letters.

Chapter 10
Index

Plates

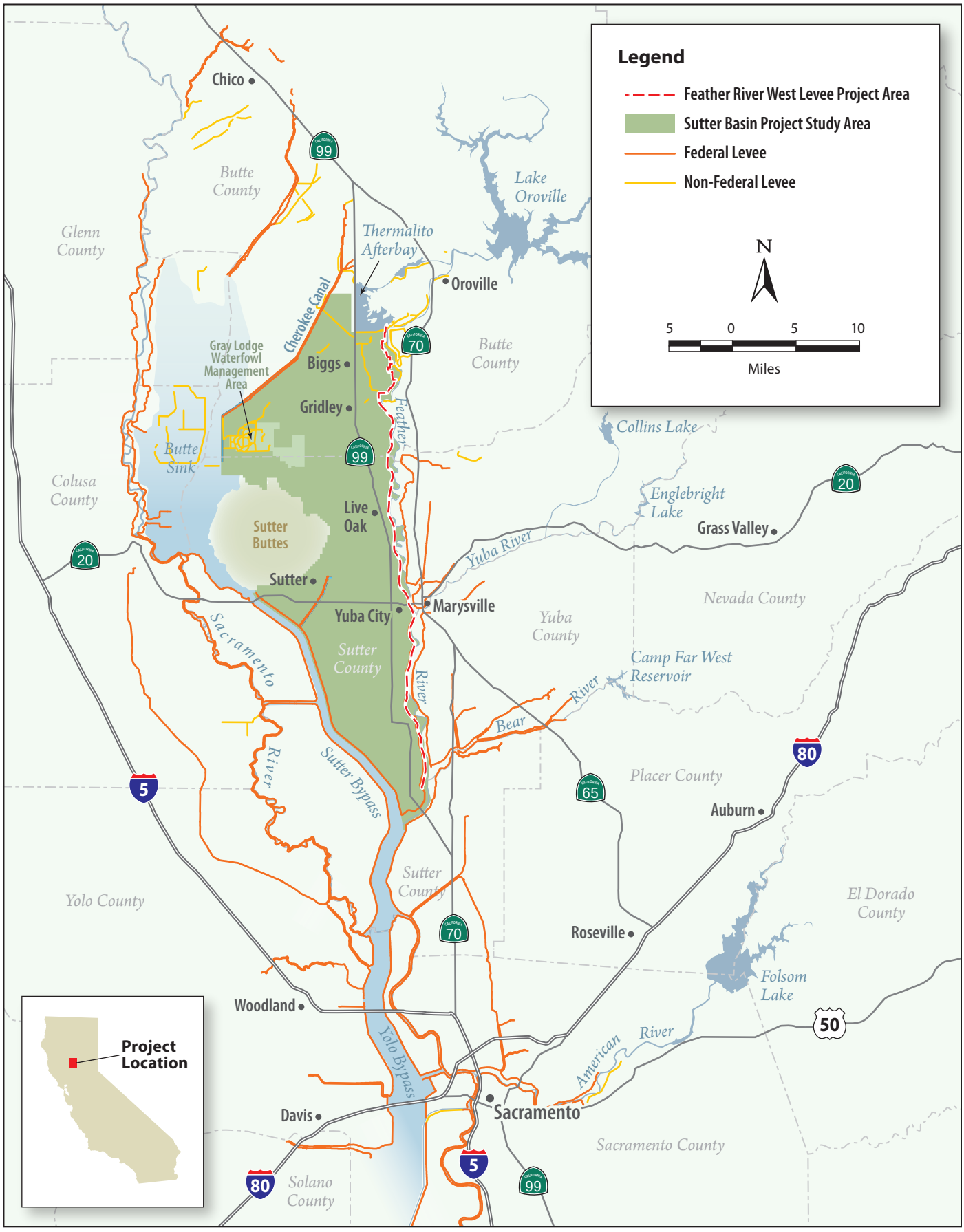

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Plate 1-1
Regional Setting

State Plan of Flood Control

Lead Agency: DWR
Location: Central Valley
Goal: Guide flood management expenditures under Propositions 84 & 1E
Timeline: Complete Plan by 2014

Sacramento – San Joaquin River Basins Comprehensive Study/Central Valley Integrated Flood Management Study

Lead Agency: USACE and DWR
Location: Central Valley
Goal: Flood damage reduction and ecosystem restoration
Phase: Comp study was completed in 2002; CVIFMS is expected to be complete by 2015

Sutter Basin Project

Lead Agency: USACE and SBFCA
Location: Sutter and Butte counties
Goal: Increase flood protection for communities in Sutter and Butte counties
Phase (Timeline): Feasibility Study and EIS (2011)

Mid-Valley Project

Lead Agency: USACE and State of California
Location: Knights Landing
Goal: Flood risk reduction for Knights Landing
Timeline: Construction by 2016

Natomas Levee Improvement Program

Lead Agency: SAFCA
Location: Natomas Area, Sacramento
Goal: Achieve 200-year flood protection for the Natomas Basin
Timeline: Construction of 100 yr. protection by 2011, 200 yr. protection by 2012

West Sacramento Levee Improvements Project

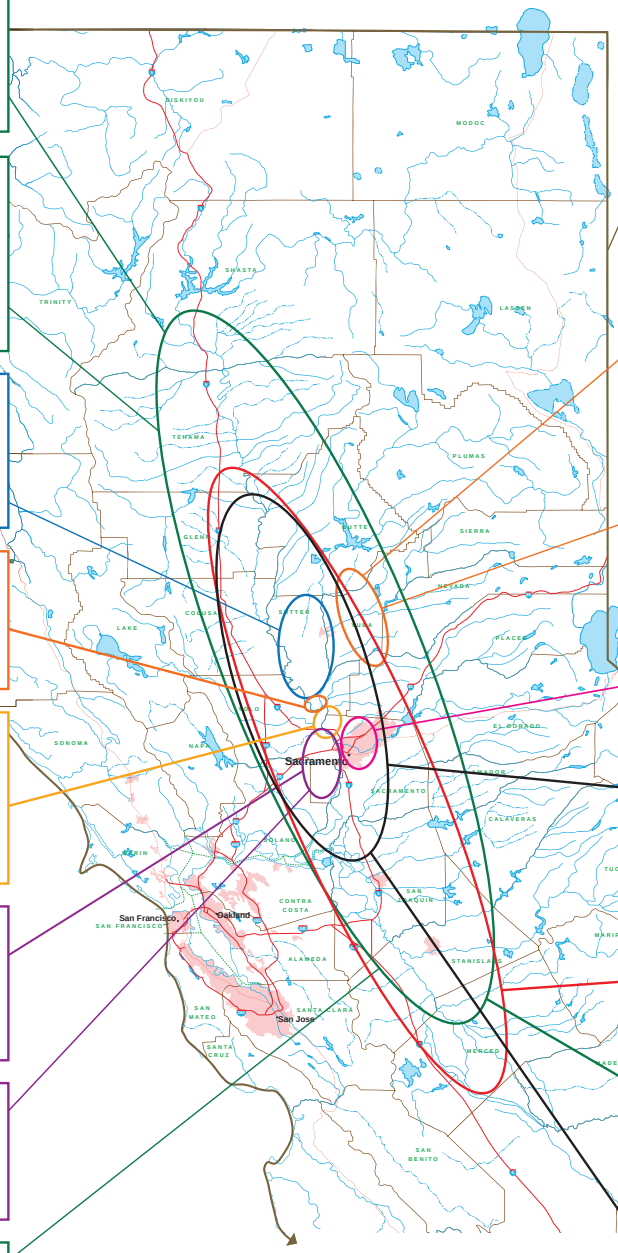
Lead Agency: USACE and WSAFCA
Location: West Sacramento
Goal: Achieve 200-year flood protection for the City of West Sacramento
Phase (Timeline): EIS/EIR (2010)

West Sacramento Project

Lead Agency: WSAFCA, USACE and DWR
Location: West Sacramento
Goal: Comprehensive analysis of the City's levee system
Phase (Timeline): GRR (2012)

Central Valley Flood Protection Plan

Lead Agency: DWR
Location: Central Valley and Sacramento-San Joaquin Delta
Goal: Develop strategies for comprehensive system-wide flood improvements
Timeline: Complete plan by 2012; complete protection measures by 2025



FloodSAFE

Lead Agency: DWR
Location: State-wide, but primarily Central Valley
Definition: Multi-faceted program to improve public safety through integrated flood management.
Timeline: Complete foundational objectives by 2025

Yuba Basin Project

Lead Agency: USACE, DWR, and YCWA
Location: Yuba, Feather, Bear rivers Watershed
Goal: Increase flood protection for communities of Linda, Olivehurst, Arboga, Marysville, and unincorporated areas of Yuba County
Phase (Timeline): GRR (2010)

Three Rivers Levee Improvement Authority Projects

Lead Agency: Three Rivers Levee Improvement Authority
Location: Southern Yuba County
Goal: Increase flood protection for communities in southern Yuba County
Phase (Timeline): Construction of 200-year protection by 2010

American River Common Features Project

Lead Agency: USACE, DWR, and SAFCA
Location: Sacramento metropolitan area
Goal: Reduce flood risks for the City of Sacramento
Phase (Timeline): GRR (2010)

Sacramento River Bank Protection Project

Lead Agency: USACE and DWR
Location: SRFCP
Goals: Federal program to correct levee erosion issues
Phase (Timeline): Ongoing Phase II EIS (2011)

PL 84-99 Rehabilitation Assistance of Flood Control Works

Lead Agency: USACE and DWR
Location: Central Valley and Sacramento-San Joaquin Delta
Goals: Federal program to provide emergency levee repairs
Timeline: Ongoing

Levee Collaborative

Lead Agency: USACE and DWR
Location: Central Valley
Goals: Develop short- and long-term plans to achieve system-wide compliance with USACE standards for the State Flood System in the Central Valley
Timeline: Ongoing

Sacramento River Flood Control System Evaluation

Lead Agency: USACE
Location: SRFCP
Goals: Repairing, raising, and strengthening urban levees
Timeline: Ongoing

ACRONYMS

WSAFCA - West Sacramento Area Flood Control Agency
USACE - U.S. Army Corps of Engineers
SBFCA - Sutter-Butte Flood Control Agency
DWR - Department of Water Resources
SAFCA - Sacramento Area Flood Control Agency
SRFCP - Sacramento River Flood Control Project
YCWA - Yuba County Water Agency

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Plate 1-2
Major Flood Risk Reduction Efforts in the Sacramento Valley

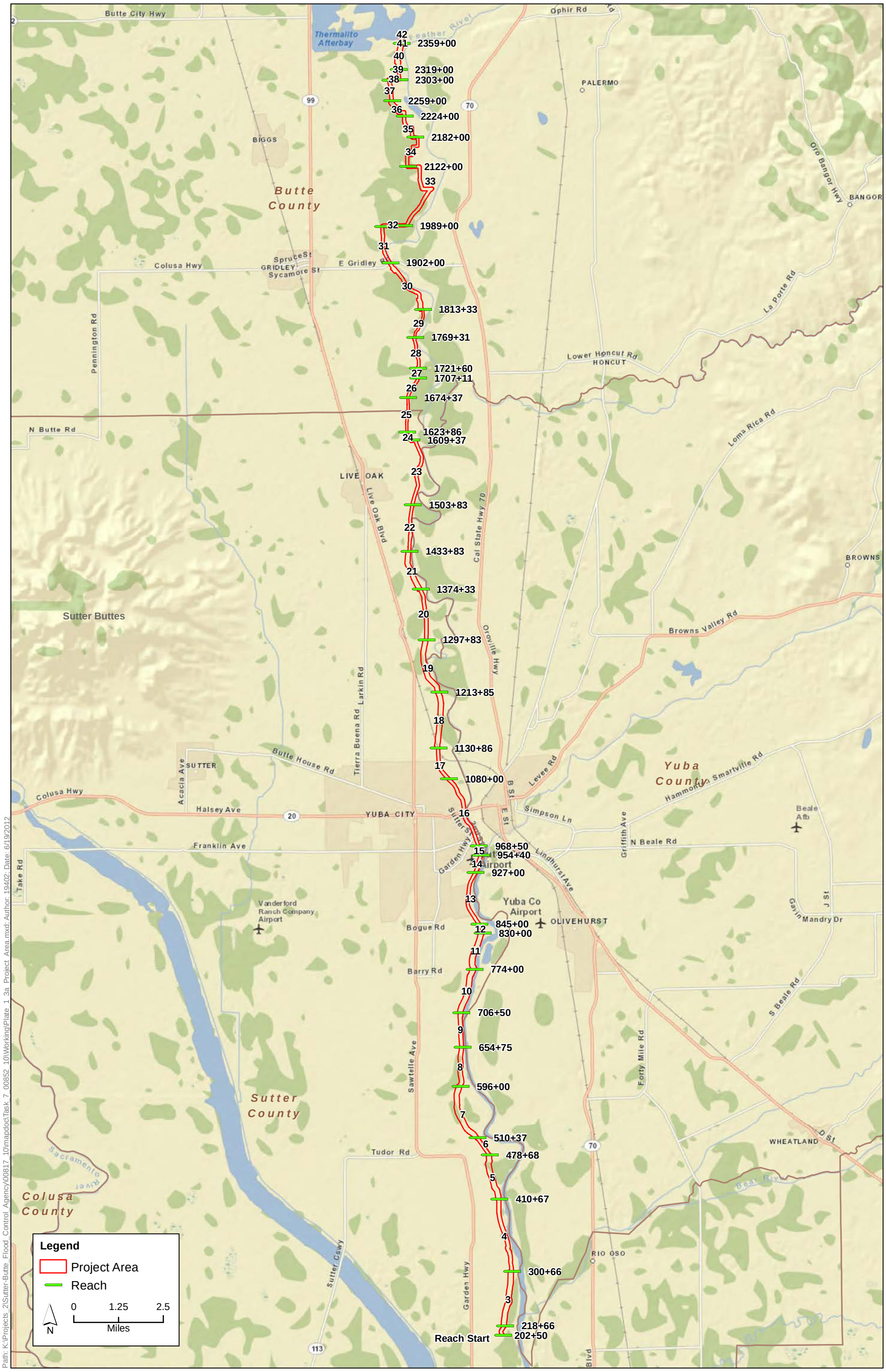

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Plate 1-3a
Project Area

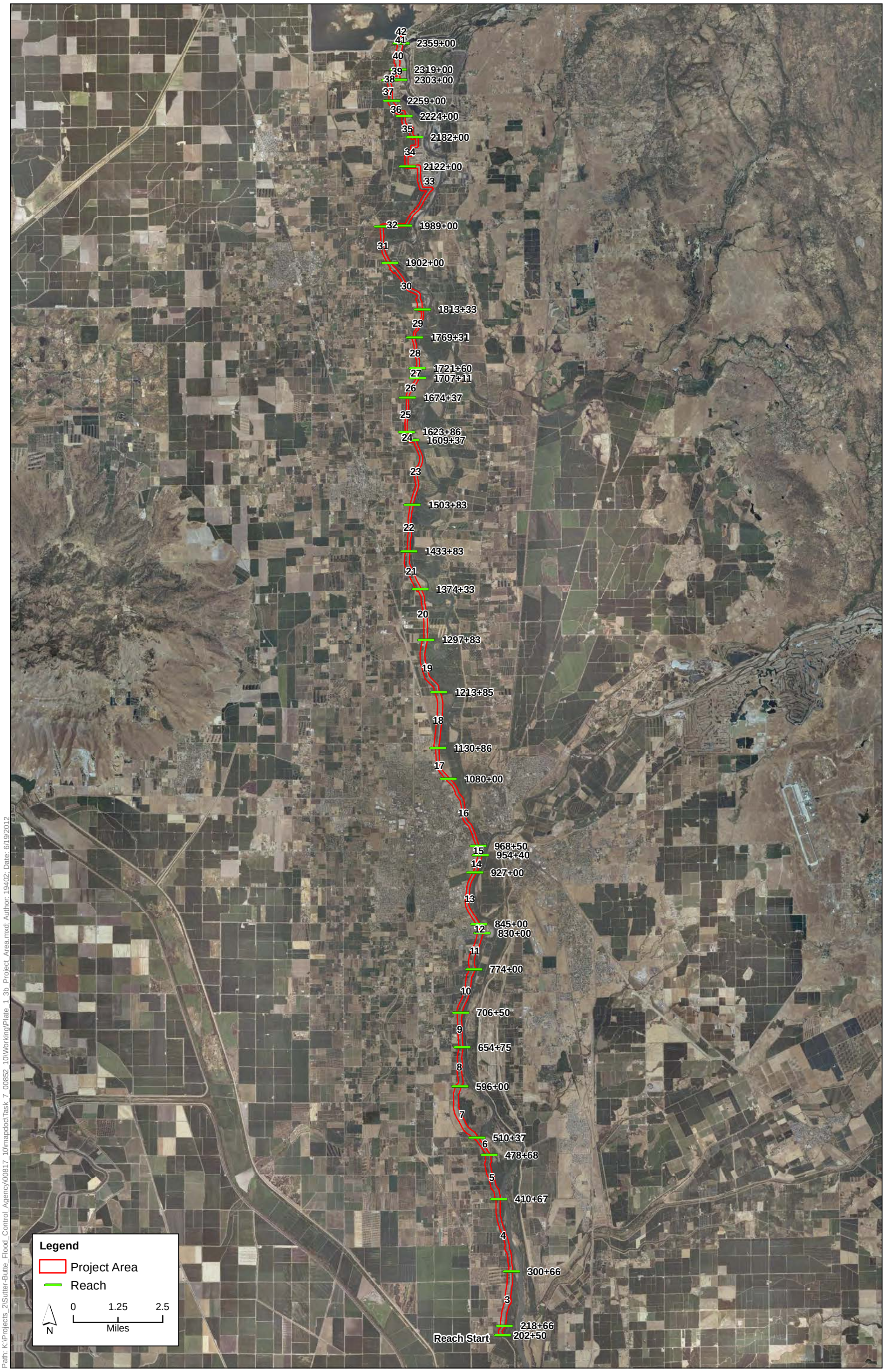

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Plate 1-3b
Project Area

Reach 4. Feather River west levee looking northeast from water side of levee crown. Note mature vegetation on waterside slope. River is off the photo to the right.

Reach 4. Feather River west levee looking northwest from landside of levee crow. Note the Sutter Buttes visible on the horizon and orchards in foreground.

Graphics ... 00852.10 (6/26/12) AB

Plate 1-4
Representative Photos of the Project Area

Reach 7. Feather River west levee looking northeast from landside slope. Note the Sutter Buttes to the left along the horizon and the agricultural fields in the foreground.

Reach 8. Feather River west levee looking northeast from waterside slope. Note the mature vegetation along the bank, and the Feather River in the middleground barely visible beyond the near vegetation.

Graphics ... 00852.10 (6/26/12) AB

Plate 1-5
Representative Photos of the Project Area

Reach 9. Feather River west levee looking south from the levee crown at Boyd's Pump. Note the boat launching facilities.

Reach 11. Feather River west levee looking south from the crown. Note the river channel at left and the mature vegetation along the bank.

Graphics ... 00852.10 (6/26/12) AB

Plate 1-6
Representative Photos of the Project Area

Reach 13. Feather River west levee looking south along the landside slope at the intersection of Shanghai Bend Road. Note the paved public access trail and the residences to the west. The river is at left off the photo.

Reach 14. Feather River west levee looking west from the landside slope at the Sutter County Airport.

Graphics ... 00852.10 (6/26/12) AB

Plate 1-7
Representative Photos of the Project Area

Reach 18. Feather River west levee looking north from the levee crown. Note the utility poles at the landside toe of the levee at left with orchards beyond.

Reach 19. Feather River west levee looking west from the land side of the levee crown. Note the Sutter Buttes in the background and orchards in the foreground.

Graphics ... 00852.10 (6/26/12) AB

Plate 1-8
Representative Photos of the Project Area

Reach 23. Feather River west levee looking south from the levee crown. Note the residence on the landside toe and the mature vegetation on both the land and watersides of the levee.

Reach 26. Feather River west levee looking north from land side of the crown. Note the irrigation canal, utility poles, and orchards to the left. Also note the decreased levee prism in this reach.

Graphics ... 00852.10 (6/26/12) AB

Plate 1-9
Representative Photos of the Project Area

Reach 32. Feather River West levee looking north from the water side of the levee crown. Note orchards on both water side and land side of the levee.

Reach 33. Feather River west levee looking north. Note the orchards on the land side to the left and the aggregate deposits in the floodplain to the right.

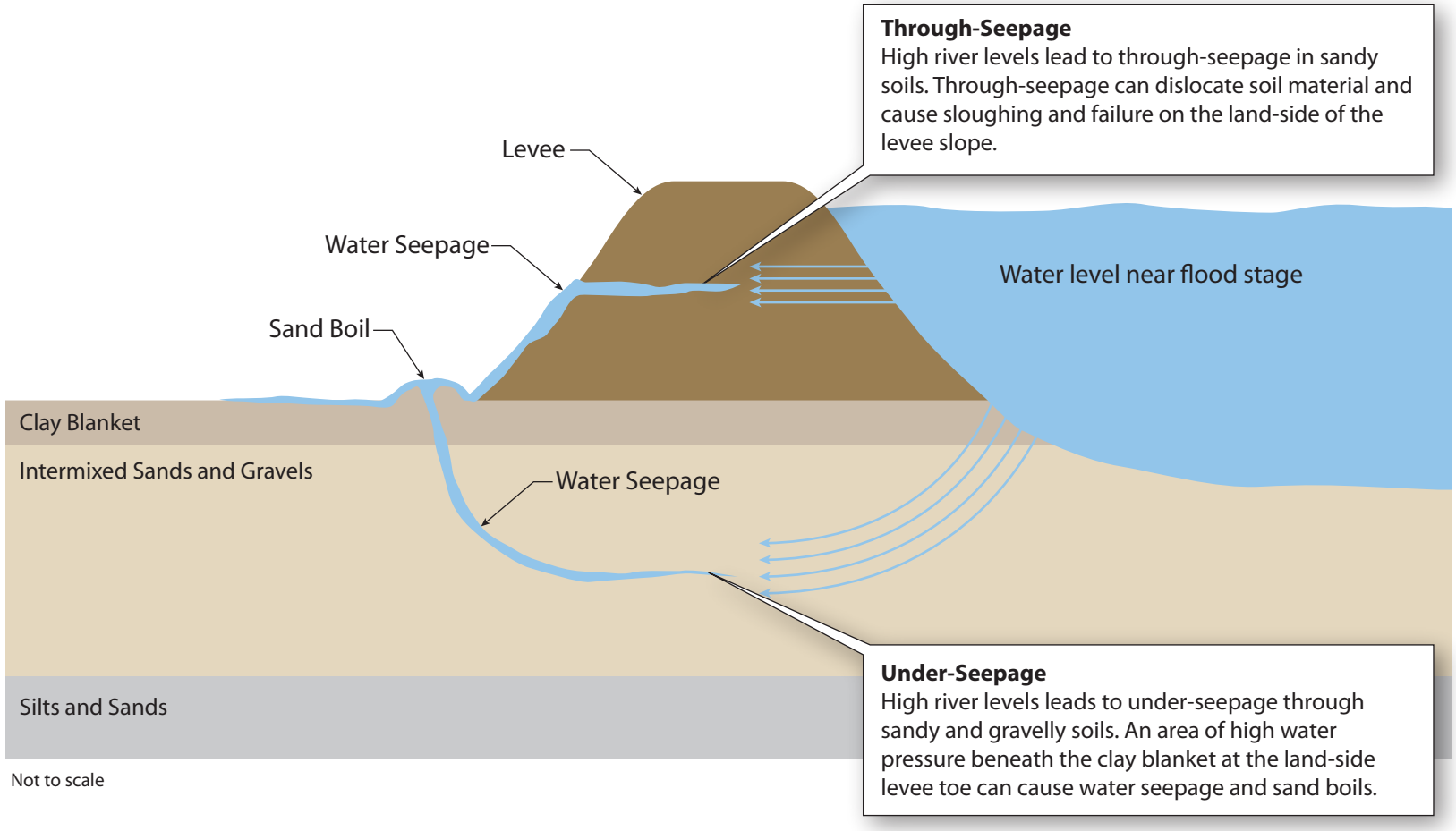
Graphics ... 00852.10 (6/26/12) AB

Plate 1-10
Representative Photos of the Project Area

Levee seepage is when water moves away from the river channel, either below or through the levee and surrounding land surface (see diagram below). Two main factors contribute to seepage:

- high water pressure within the river (such as during periods when the river is near flood-stage), and
- pervious earth material within and underlying the levee.

The combination of high water pressure and pervious material can be evident in sand boils and water seepage on the land-side of the levee. Under severe conditions, the clay blanket on the land side may be ruptured and the increased flow of the under-seeping water undermines the levee, causing the levee to breach or collapse.

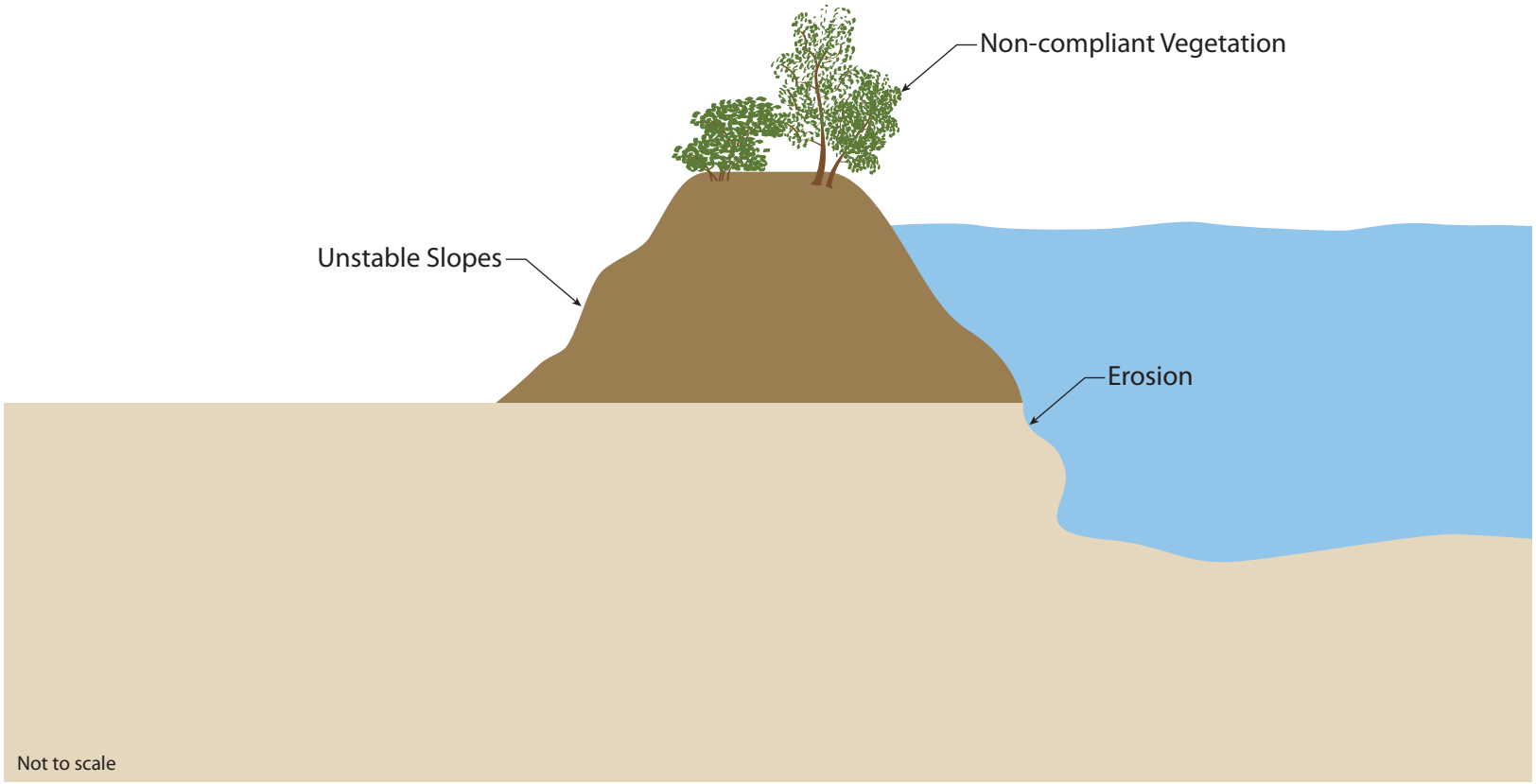


Graphics ... 00852.10 (6/26/12) AB

Plate 1-11
Levee Seepage

Typical Levee Deficiencies

- Unstable Slopes - irregular or overly steepened slopes compromise the levee structure
- Erosion - water flow, wakes, and waves damage the levee by removing soil
- Vegetation and other Encroachments - this can hinder levee monitoring and maintenance, and raise water surface elevation



Graphics ... 00852.10 (6/26/12) AB

Plate 1-12
Other Typical Levee Deficiencies

Bellevue Ave
Laurel Ave
Oak Ave
Cypress Ave
Central Ave
Clayton Ave
Levee Rd
202+50
218+66
3
300+66
4

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Legend

- Reach
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- Encroachment
- No Work\Construction Access Only

Plate 2-1
Alternatives 1-3

Sheet 1

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Garden Hwy

Willkie Ave

Lyon Ave

Oconnor Ave

Peck Ave

Ashford Ave

Carlisle Rd

Clayton Ave

410+67 5

478+68 6

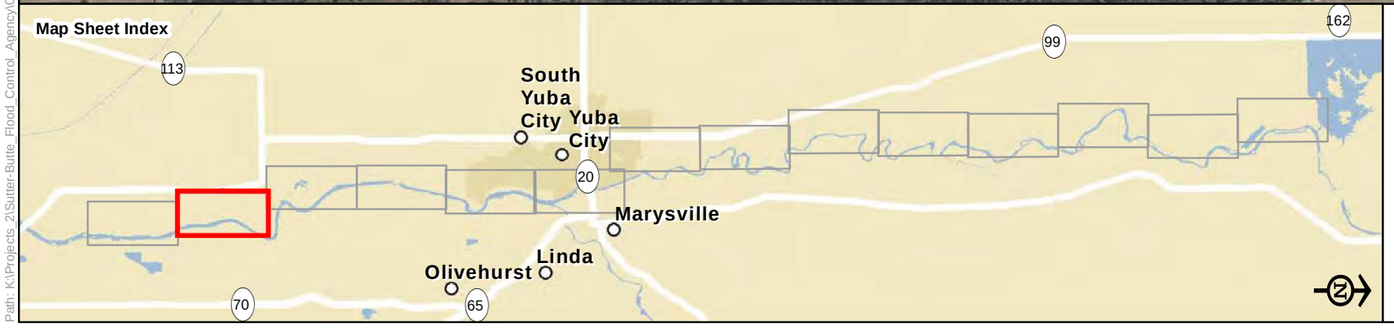

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Plate 2-1
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Garden Hwy

Obanion Rd

Garden Hwy

596+00

8

Shannon Rd

Star Bend Rd

510+37

7

Levee Rd

Country Club Rd

Anderson Ave

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Messick Rd

Oswald Rd

Barry Rd

Garden Hwy

706+50 10

654+75 9

Levee Rd

774+00 11

Levee Rd

Broadway St

Plumas Blvd

Private Rd

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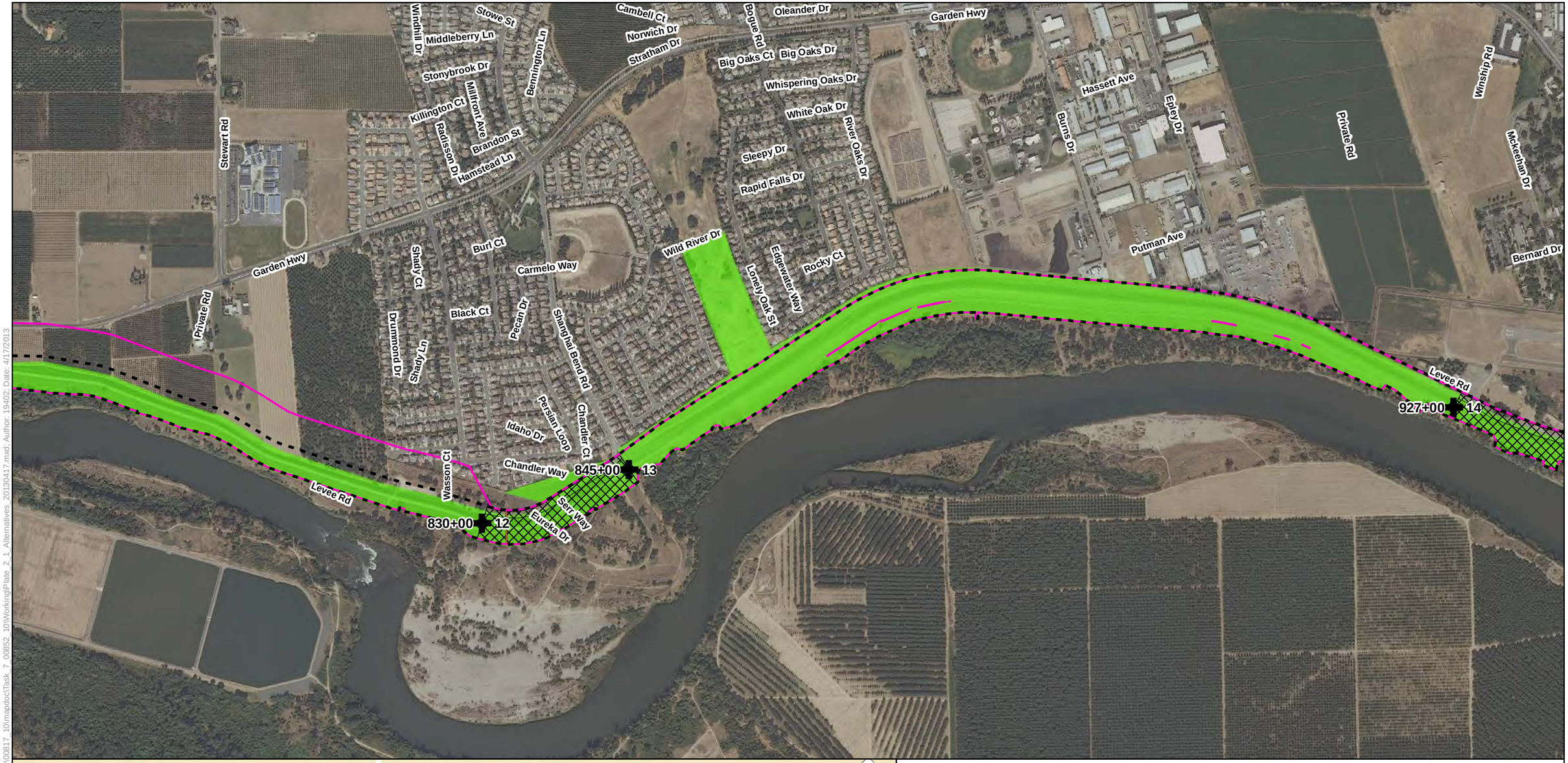

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Main St
Percy Ave
E Taber Ave
Rowe Ave
Elm St
Fremont Way
Scott St
Plumas St
Rockholt Way
Shasta St
Bell Ave
Wilson Ave
Moore Ave
Nelson Ave
Del Monte Ave
Plumas Blvd
A St
B St
Craddock St
Center St
Francis Way
Perkins Way
Harkey Way
Airsley Ave
Bird St
Market St
Lynn Way
Woodbridge Ave
Cemetery Way
Kiley Ave
Colusa Ave
Alturas St
Del Norte Ave
James Ln
Dorman Ave
Stevens Ave
Wilbur Ave
Aylor Ave
Teegarden Ave
Miles Ave
Atwood Dr
Emerson Ave
Boyd St
Bridge St
Ramp
Sutter St
Von Geldern Way
Levee Rd
McKeehan Dr
John Tee Dr
Central St
C St
Heiken Way
Twin Cities Memorial Ramp
State Hwy 20
Webb St
Bernard Dr
Samuel Dr
Mcrae Way
Jackson St
Fairman St
Keyser St
Parking Lot
Monterey Ave
Franklin Ave
Gibson Ave
Courthouse Way
Woodcrest Way
Garden Hwy
2Nd St
5Th St
968+50
16
954+40
15
Airport Rd
Levee Rd
Bizz Johnson Dr
Featherside Way
Olive St
Private Rd
Alley
12Th St
11Th St
14Th St
J St
Pine St
I St
9Th St
Lemon St
H St
Maple St
13Th St
15Th St
Orange St
Ellis Lake Ct
Ellis Lake Dr
3Rd St
6Th St
4Th St
7Th St
8Th St
10Th St
G St
F St
Willow St

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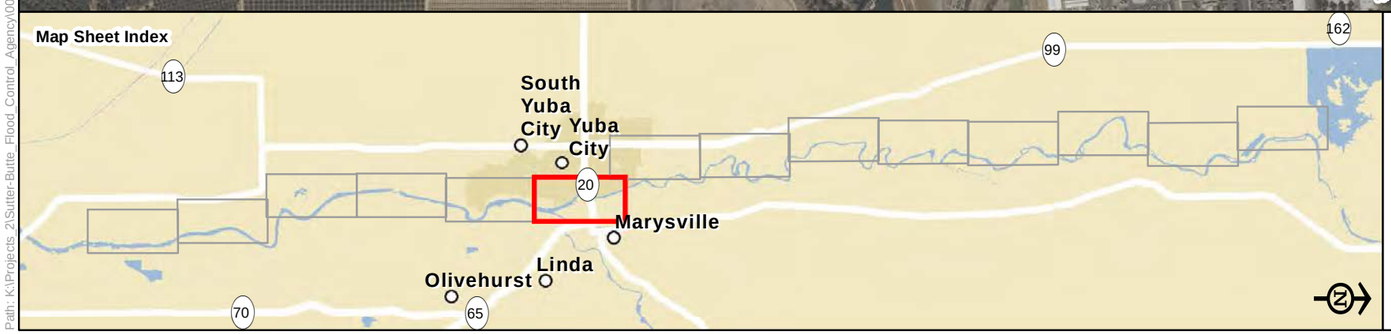

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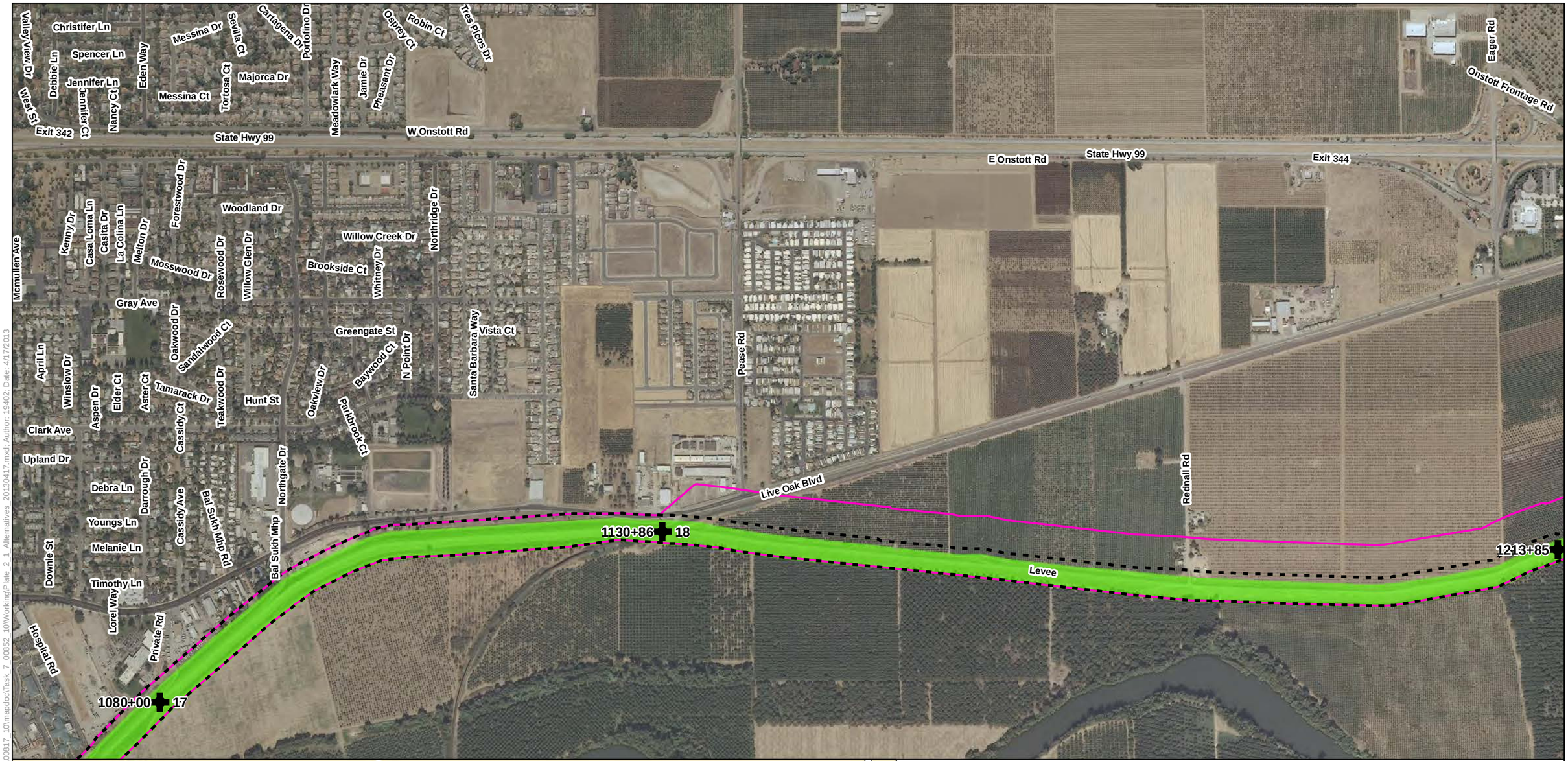

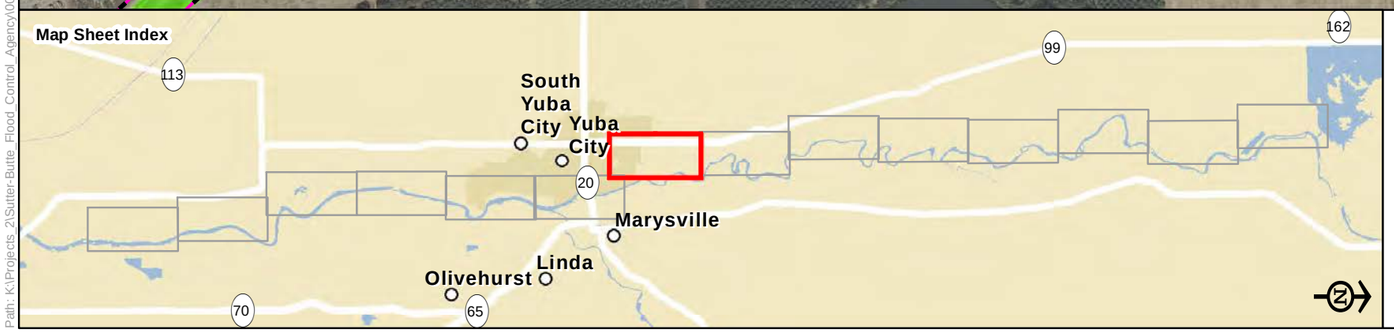

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Sanders Rd
Onstott Frontage Rd
Live Oak Blvd
Exit 344
State Hwy 99
Morse Rd
Koch Ln
Levee Rd
1297+83
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19

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Live Oak Blvd
Clark Rd
Cutting Ave
Mcdonald Ave
Paseo Rd
Sheldon Rd
Bishop Ave
Kent Ave
Kent Ave
Hermanson St
Bridgeford Rd
Levee Rd
1433+83
22
Private Rd
1503+83
23
Levee
1374+33
21
Levee Rd
Levee

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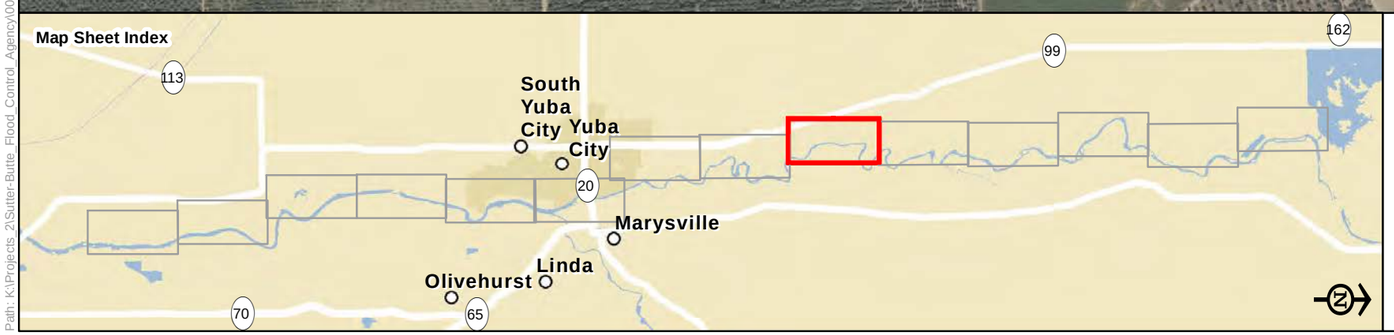

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Sheldon Rd
Kent Ave
Archer Ave
Pennington Rd
Cooley Rd
Metteer Rd
Campbell Rd
Encinal Rd
Riviera Rd
Private Rd
Levee Rd
1623+86
25
1609+37
24
Private Rd
Levee
Sparrow Ln

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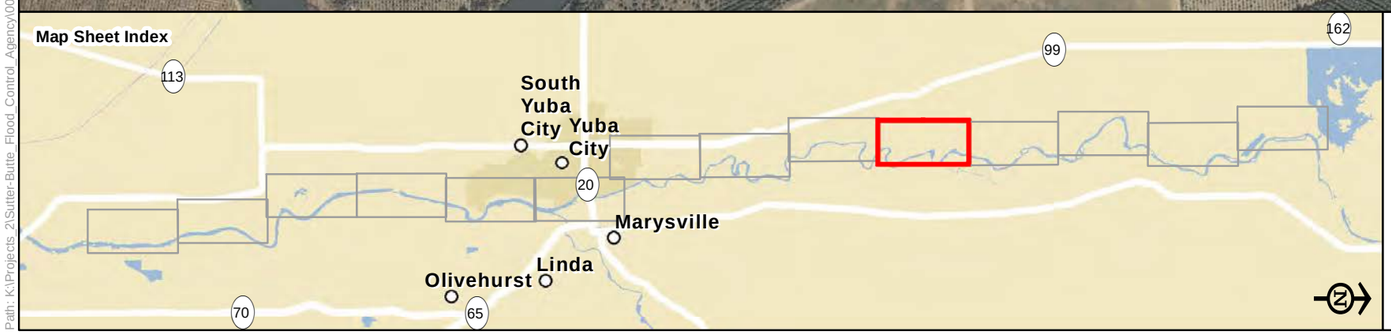

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Metteer Rd
Chandon Ave
Campbell Ave
E Evans Reimer Rd
Center Ave
Thresher Ave
Clardy Ave
Alexander Ave
Levee Rd
1674+37
26
1707+11
27
1721+60
28
1769+31
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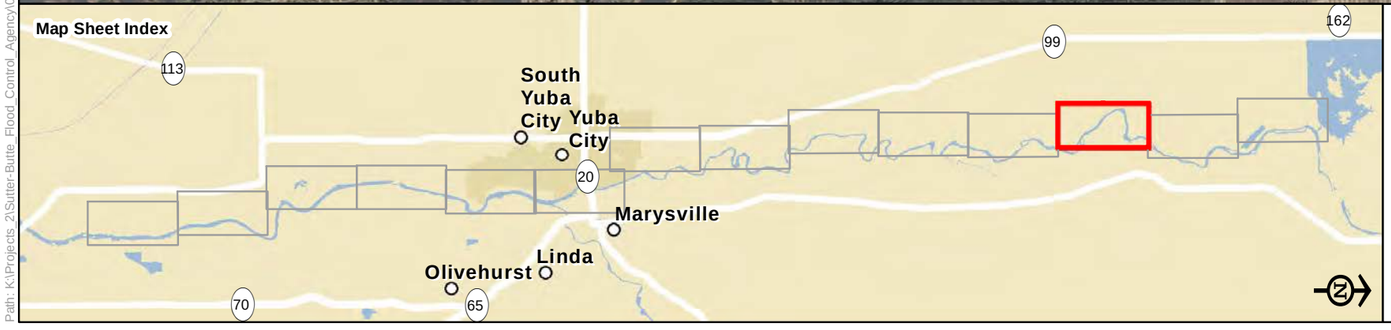
River Ave
Keifer Ave
Fagan Ln
Kirk Rd
Rutland Ct
Marie Ct
Maitland Ct
Staff Dr
Sussex Ave
Ogden Ave
Mcconnell Ave
Booth Dr
Keith Ave
Richards Ave
Hutchins Dr
E Gridley Rd
Ord Ranch Rd
Alexander Ave
1813+33 30
1902+00 31
1958+00 32
1989+00 33

Map Sheet Index



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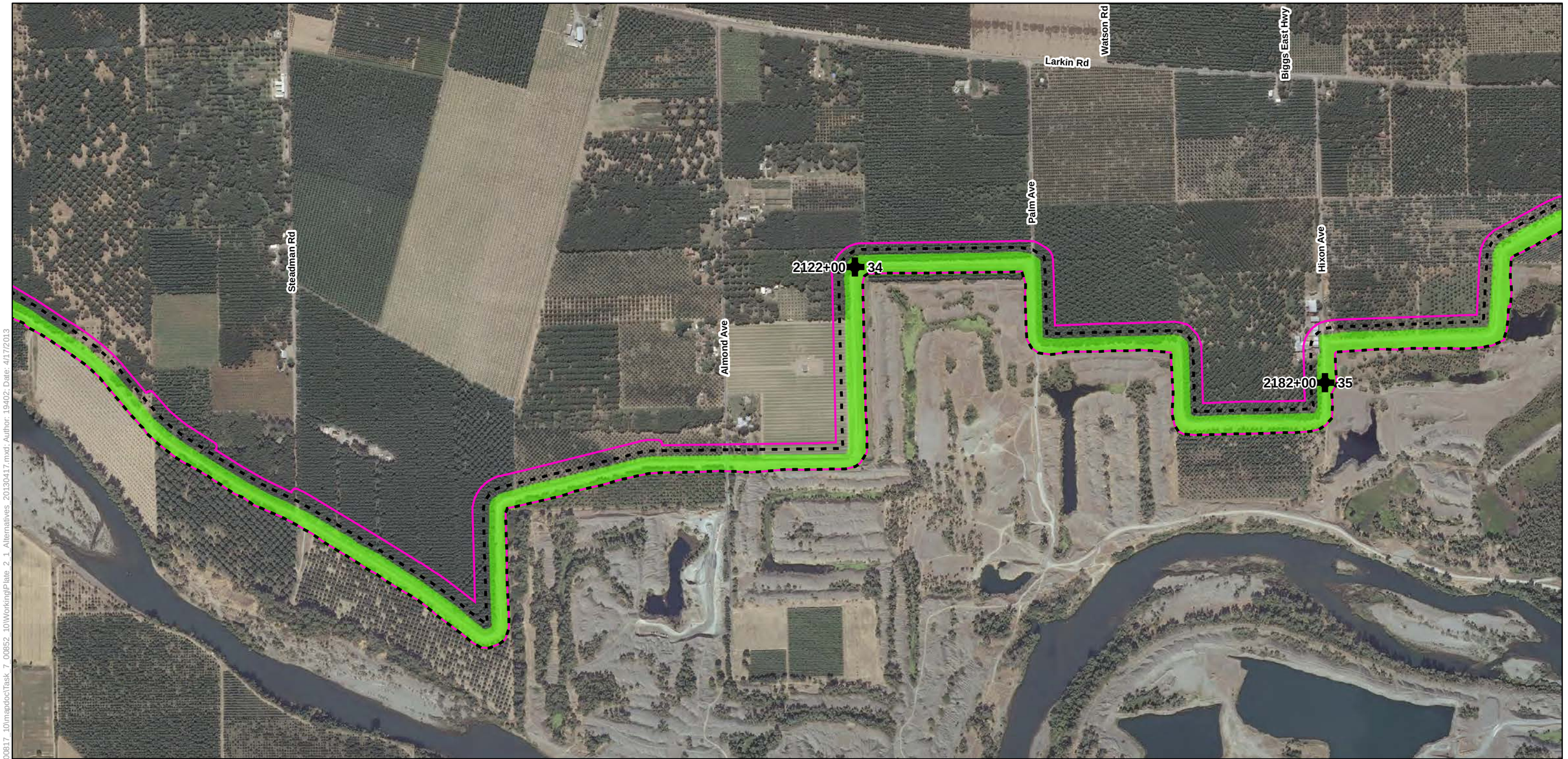

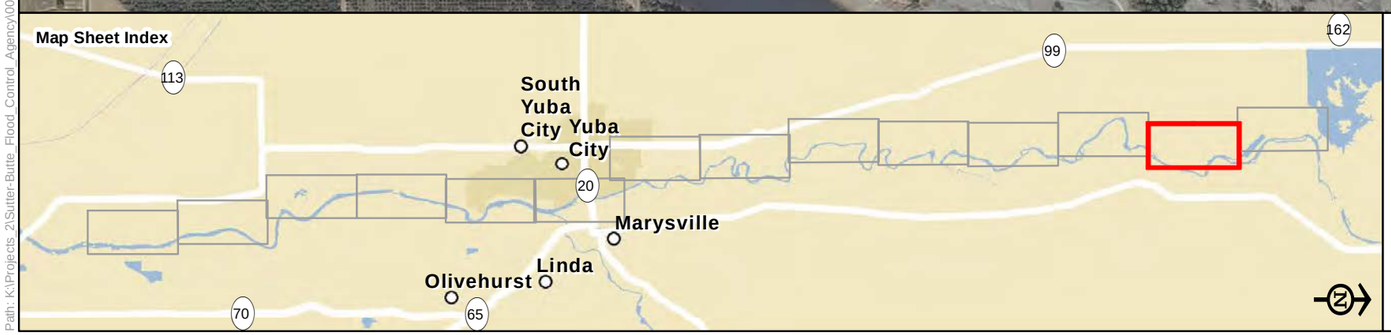

Legend

- Reach
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- Alternative 3
- Encroachment
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Plate 2-1
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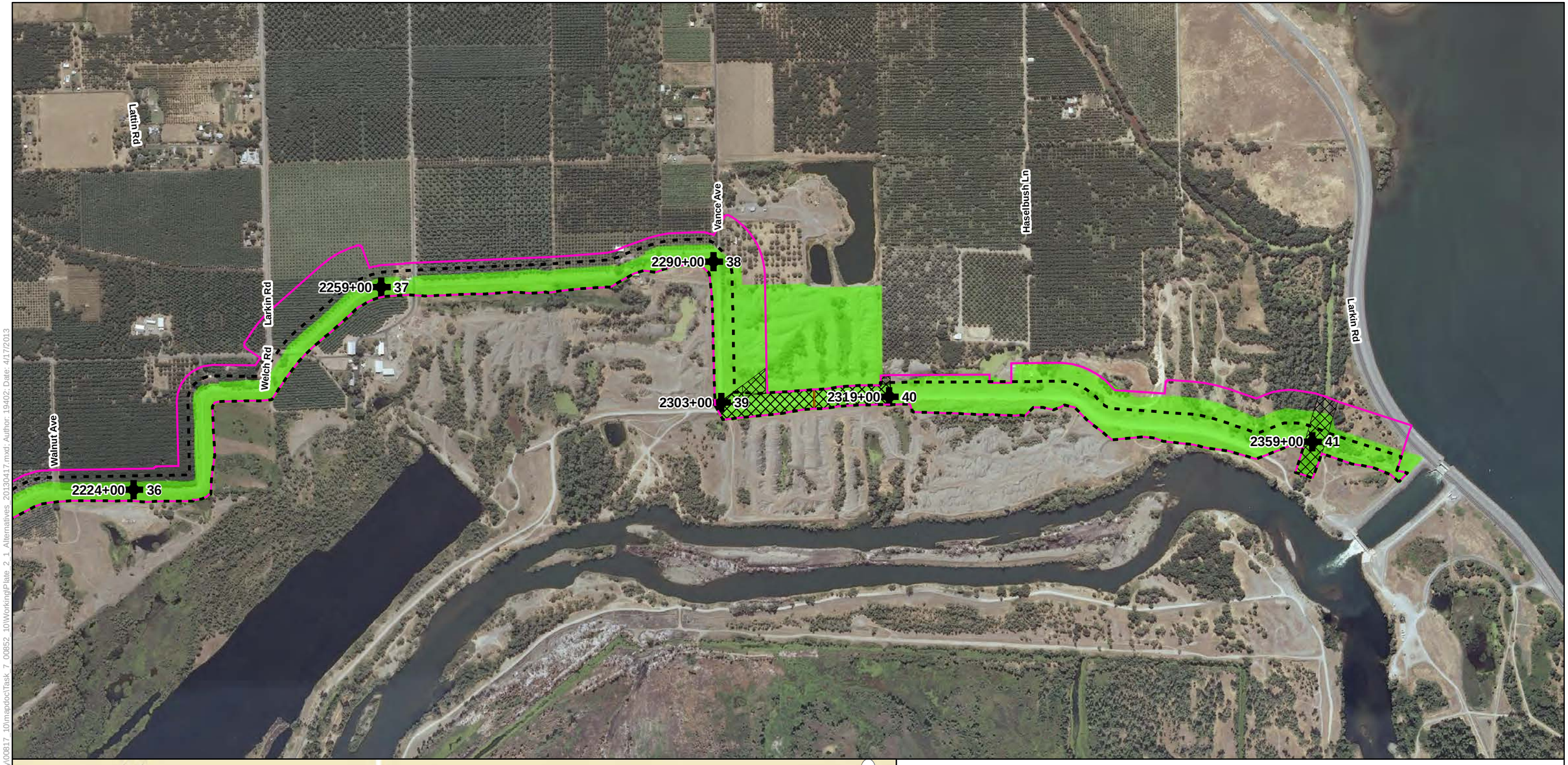

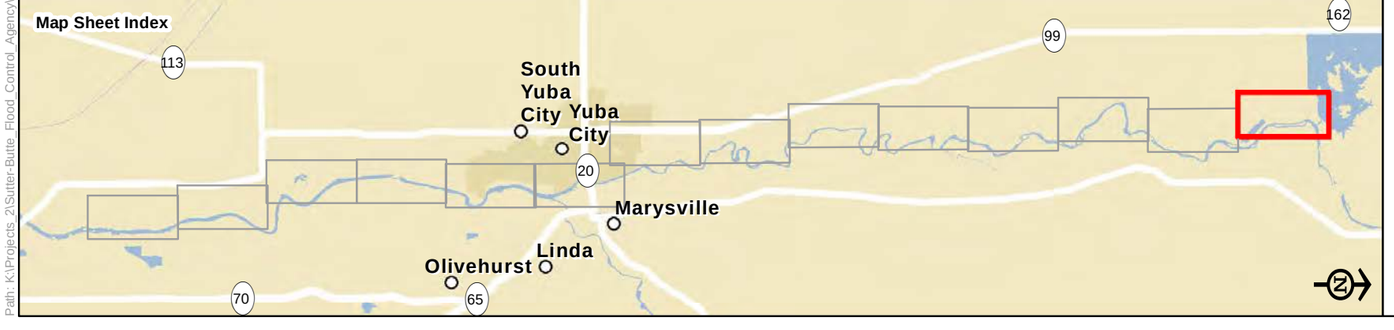

Legend

- Reach
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Plate 2-1
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Plate 2-2
Potential FRWLP Borrow Sites

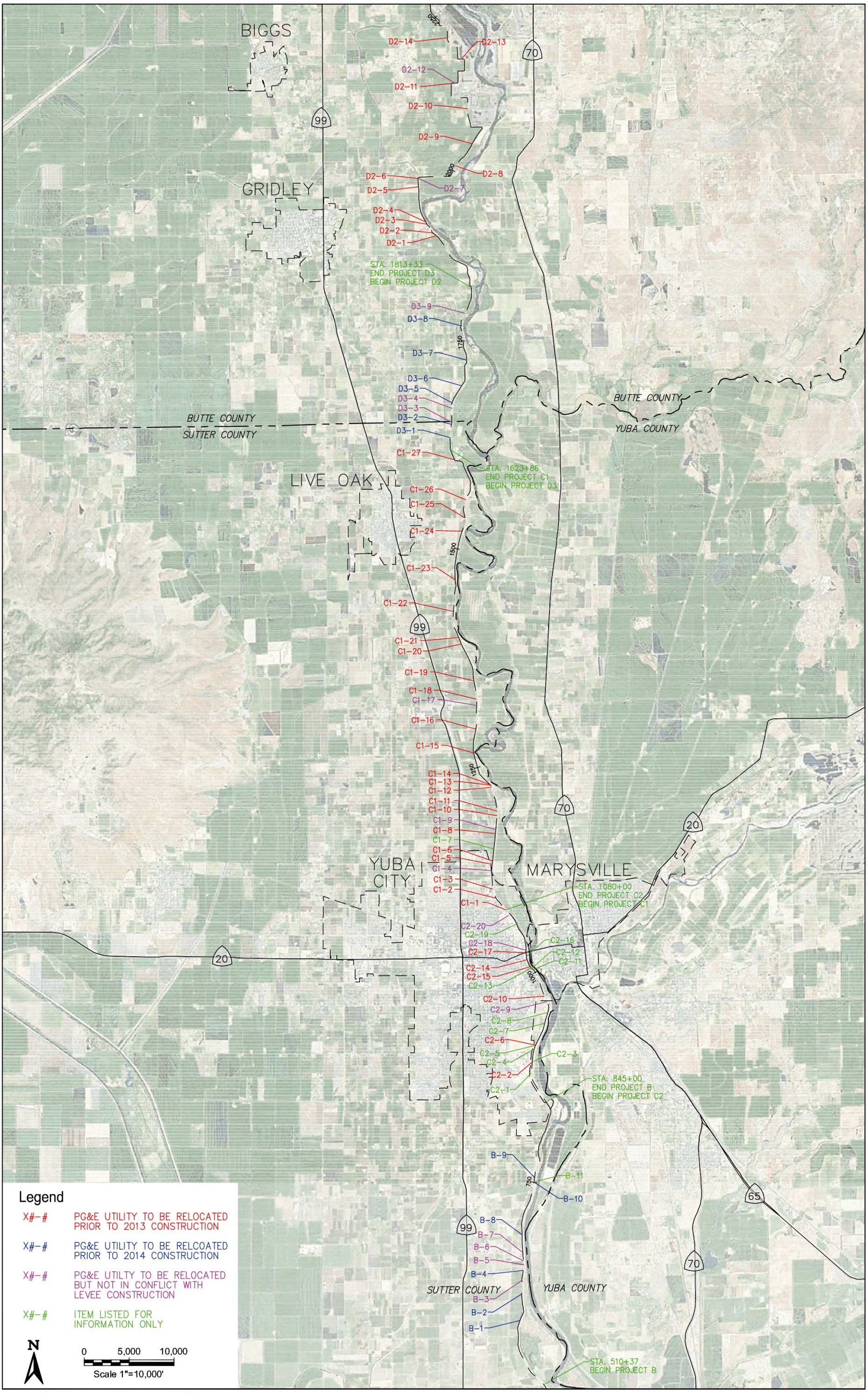


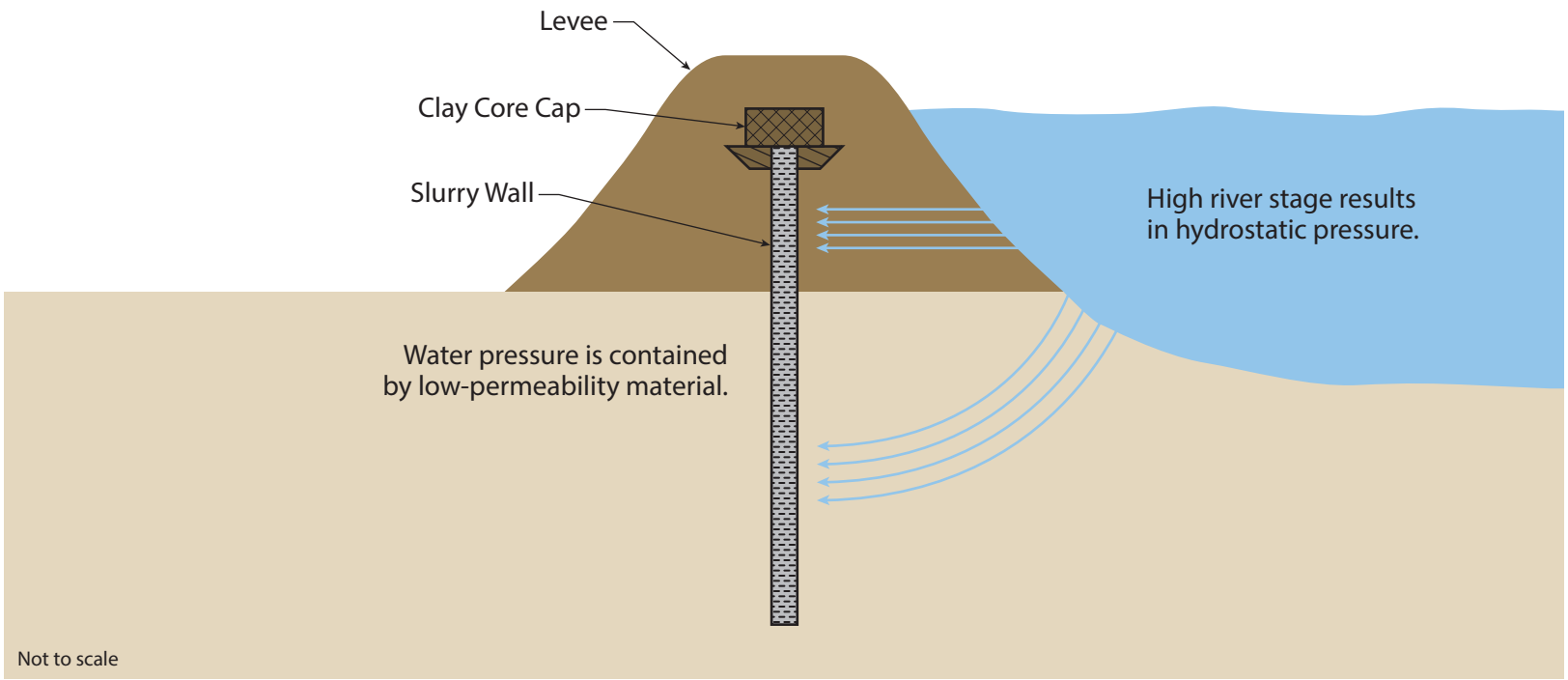
Plate 2-3
PG&E Project Relocations

Concept

Through-seepage is controlled by a low-permeability wall conctructed within the levee cross section.

Details

- Constructed via conventional slot trench, deep soil mixing or jet grouting method.
- Wall is approximately 3' wide and up to 140' deep.
- Wall is often capped with a clay core.

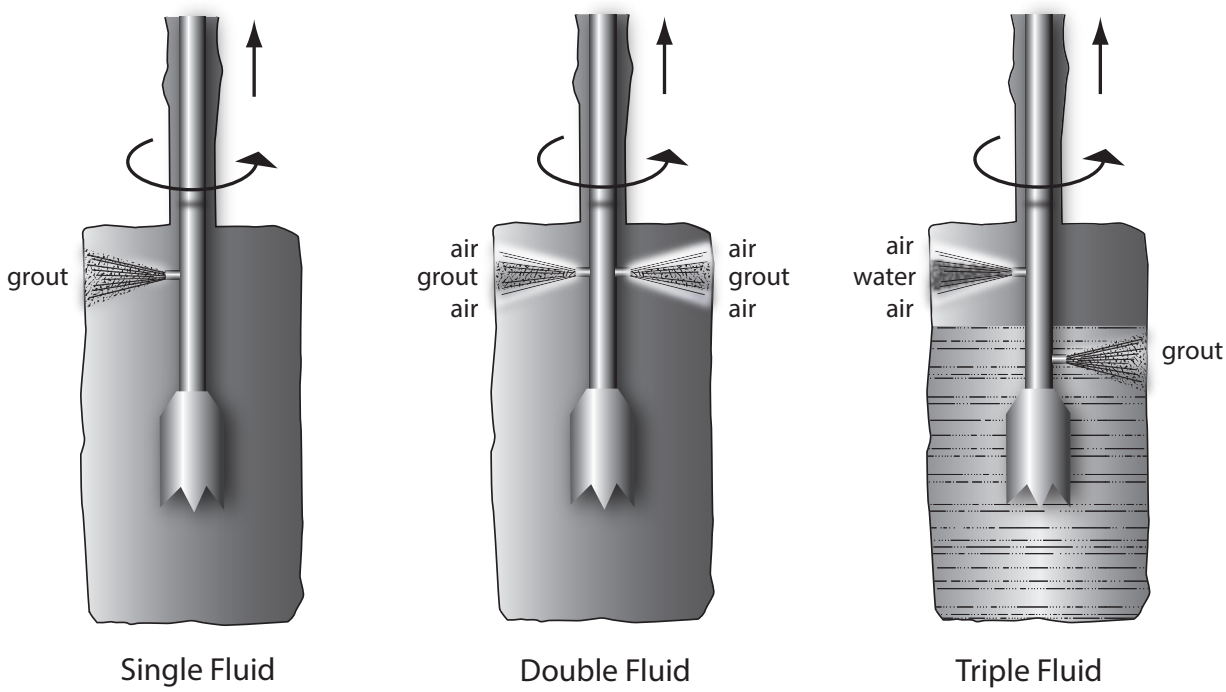


Graphics ... 00852.10 (8/3/12) AB

Plate 2-4
Slurry Cutoff Wall

Plate 2-5
Deep Soil Mixing

Graphics . . . 00852.10 (8/3/12) AB



Graphics . . . 00852.10 (8/3/12) AB

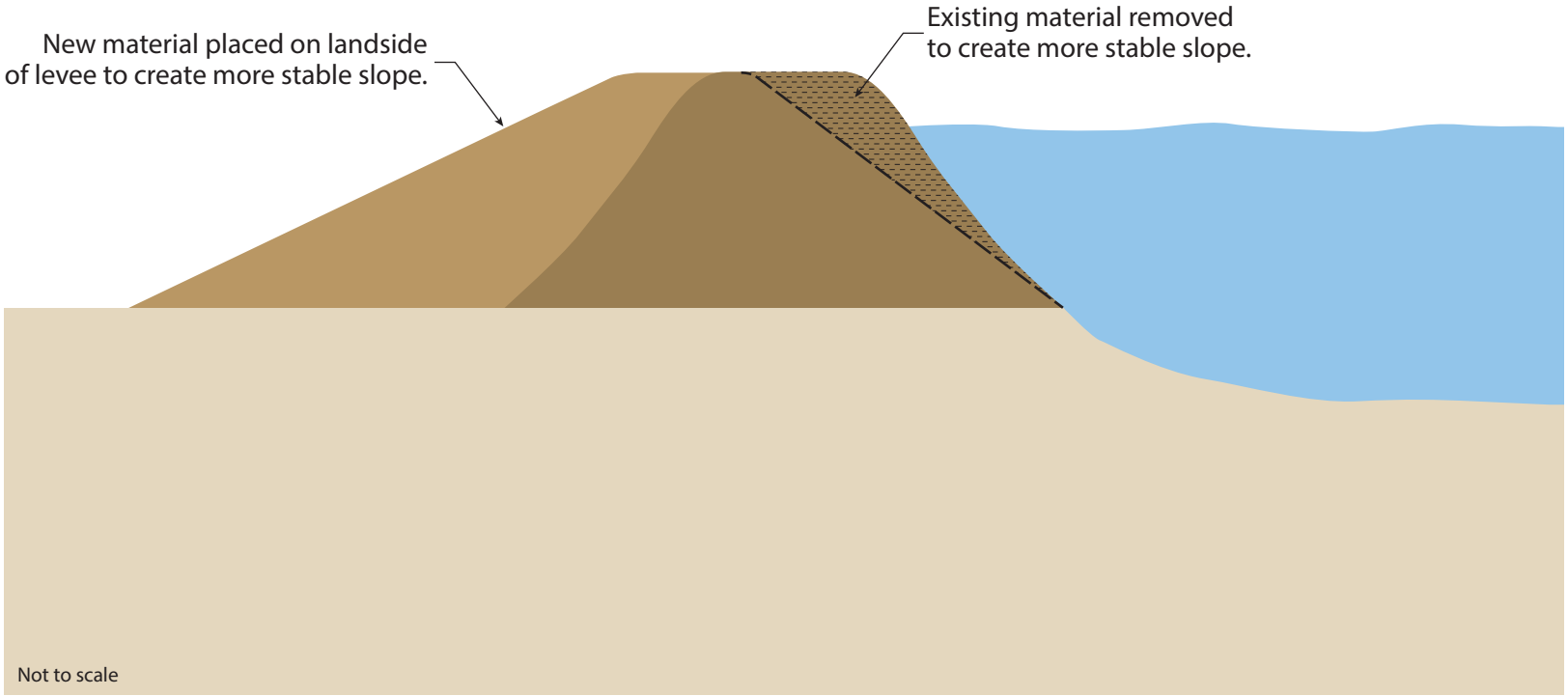
Plate 2-6
Jet Grouting Diagrams

Concept

Flatter slopes are more stable and less susceptible to erosion.

Details

- Slopes are repaired by reforming material on the landside (and waterside if necessary) to create flatter slopes.
- New material will meet current standards.



Graphics ... 00852.10 (8/3/12) AB

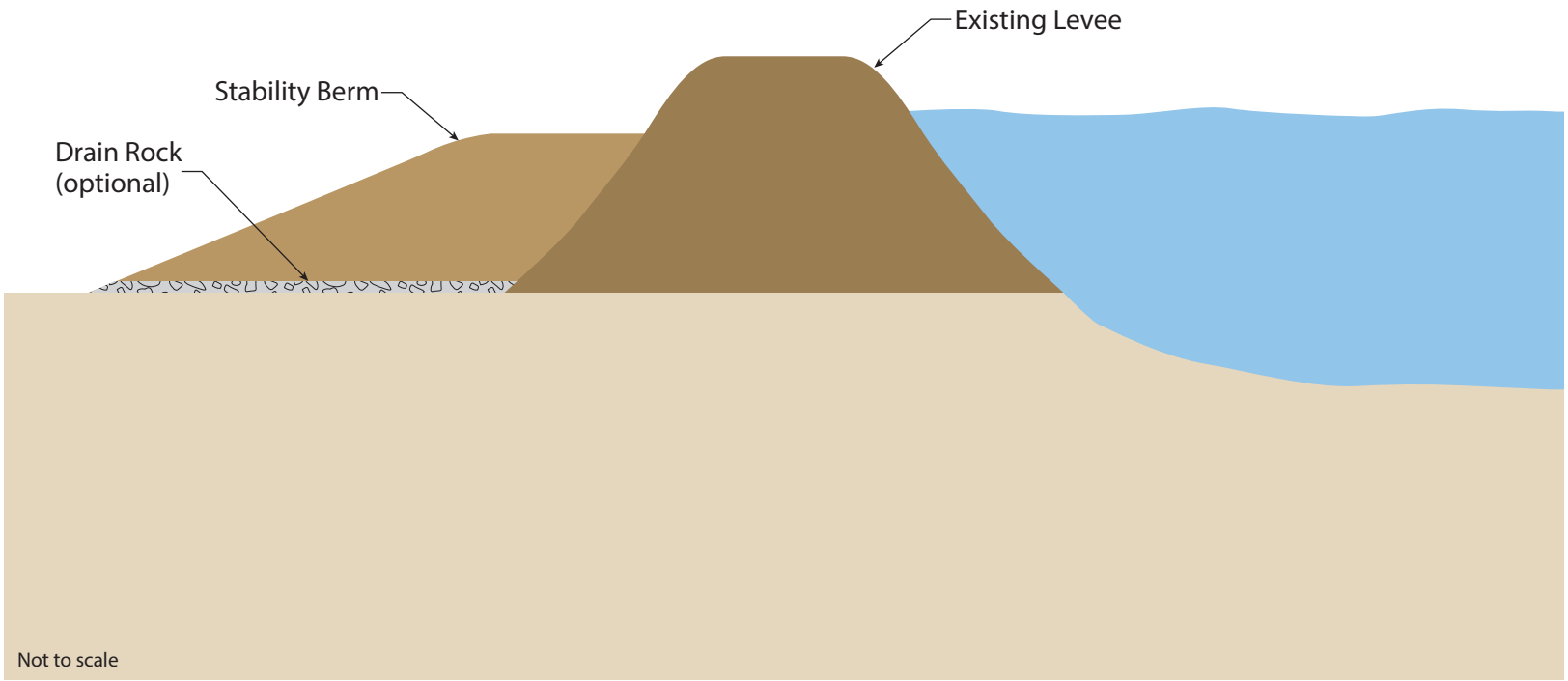
Plate 2-7
Slope Flattening

Concept

Provides additional support to levee to increase strength.

Details

- Berm height is generally 2/3 the height of levee, extending for a distance determined by the structural needs of the levee.
- An optional drainage layer may underlie the berm.



Graphics ... 00852.10 (8/3/12) AB

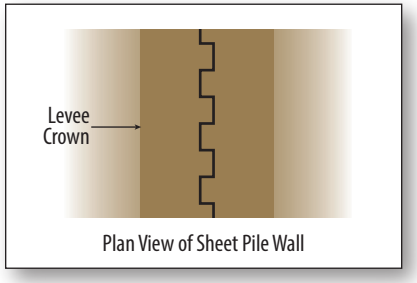
Plate 2-8
Stability Berm

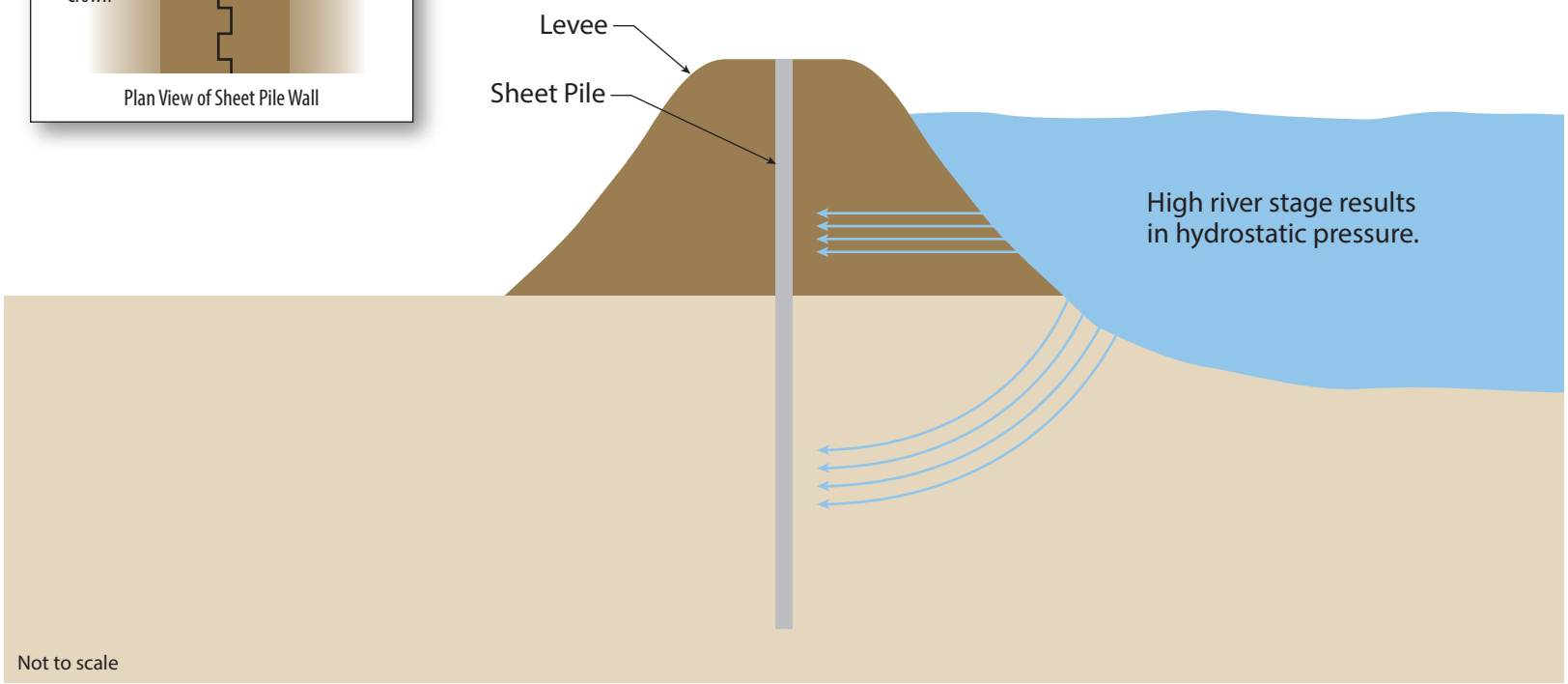
Concept

Steel panels are driven into the levee core to provide a seepage barrier.

Details

- Interlocking steel sheet piles are driven into the ground by a pile driving head attached to a crane.
- Pre-drilling of soil may be necessary if earth is particularly solid.





Graphics ... 00852.10 (8/3/12) AB

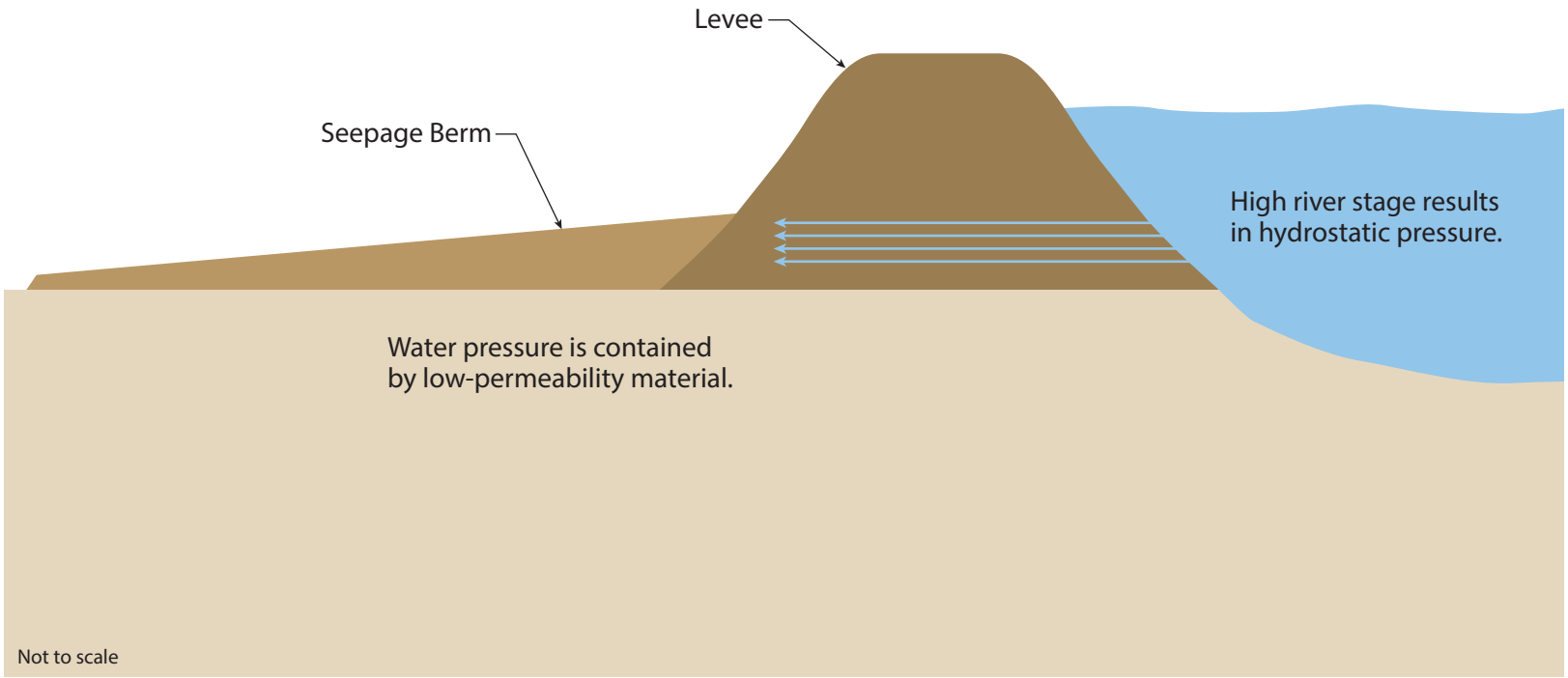
Plate 2-9
Sheet Pile Wall

Concept

Water pressure is contained and dispersed by a thickened soil layer.

Details

- Berm is typically one-third the height of the levee.
- Berm may extend 300' from the levee.
- Landside toe of berm may include optional relief trench.



Graphics ... 00852.10 (8/3/12) AB

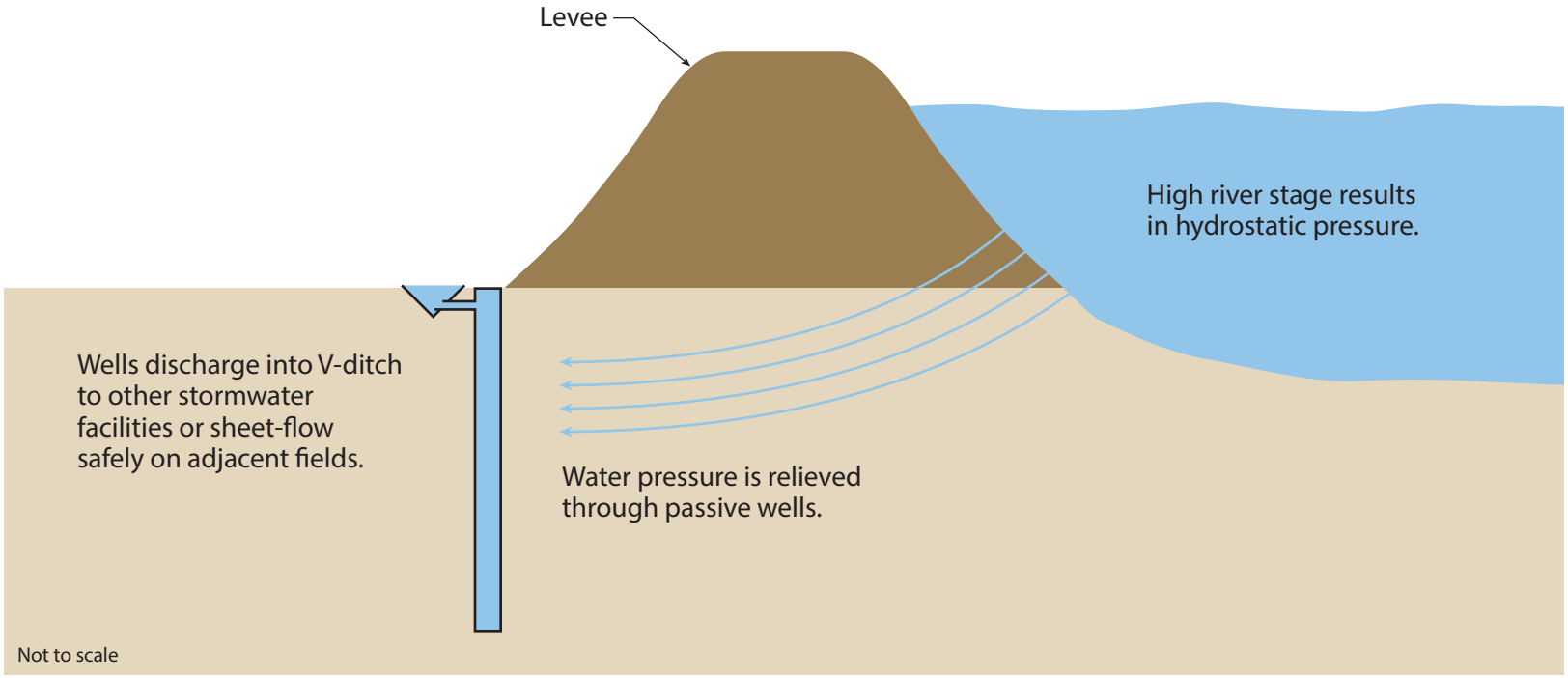
Plate 2-10
Seepage Berm

Concept

Water pressure is relieved via passive wells, which direct water discharge into a collection system.

Details

- Wells are drilled near levee toe, approximately 80’ deep.
- Well spacing is approximately 50’-100’.



Graphics ... 00852.10 (8/3/12) AB

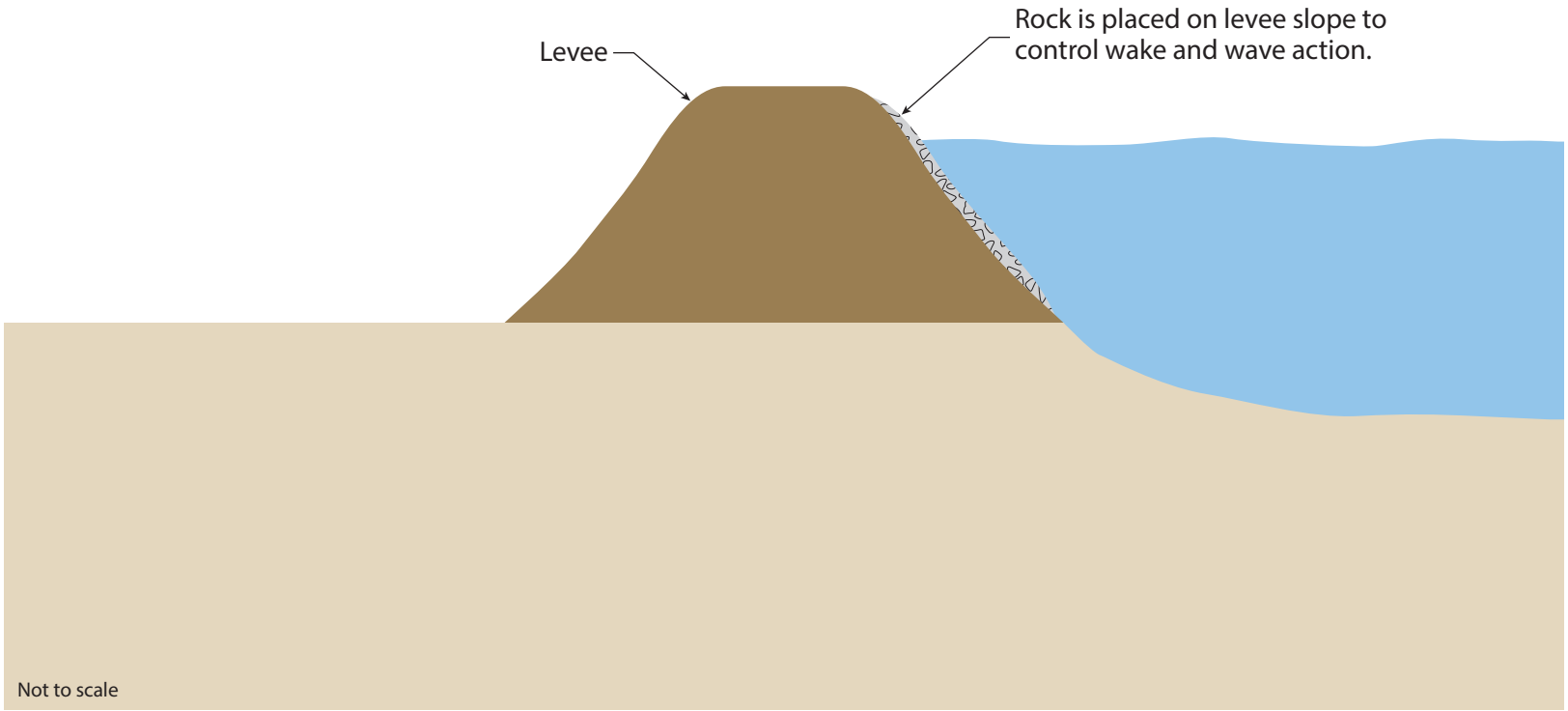
Plate 2-11
Relief Well

Concept

Water-side erosion is prevented by placement of rock.

Details

- Rock is typically 8″-18″ in diameter, placed in a 30″ layer.
- Rock could be covered by soil and/or vegetation.



Graphics ... 00852.10 (8/3/12) AB

Plate 2-12
Rock Slope Protection

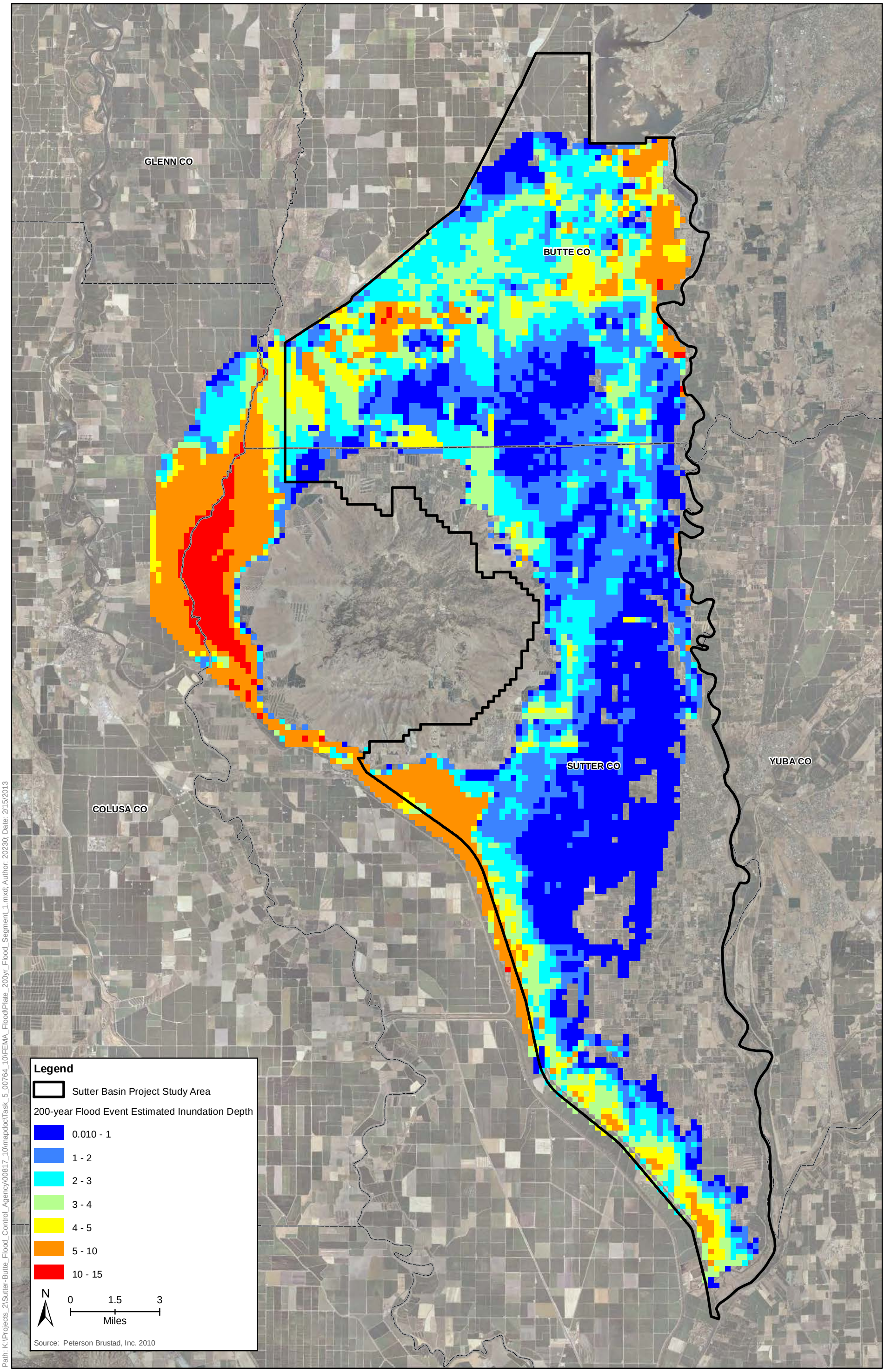


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Plate 2-13
200-year Flood Event Estimated Inundation Depth - Segment 1

GLENN CO

BUTTE CO

COLUSA CO

SUTTER CO

YUBA CO

Legend

Sutter Basin Project Study Area

200-year Flood Event Estimated Inundation Depth

- 0.010 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- 10 - 18

N

0 1.5 3

Miles

Source: Peterson Brustad, Inc. 2010

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\FEMA_Flood\Plate_200yr_Flood_Segment_2.mxd; Author: 20230; Date: 2/15/2013

Plate 2-14

200-year Flood Event Estimated Inundation Depth - Segment 2

GLENN CO

BUTTE CO

COLUSA CO

SUTTER CO

YUBA CO

Legend

Sutter Basin Project Study Area

200-year Flood Event Estimated Inundation Depth

- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- 11 - 12

N

0 1.5 3

Miles

Source: Peterson Brustad, Inc. 2010

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\FEMA_FloodPlate_200yr_Flood_Segment_3.mxd Author: 20230; Date: 2/15/2013

Plate 2-15

200-year Flood Event Estimated Inundation Depth - Segment 3

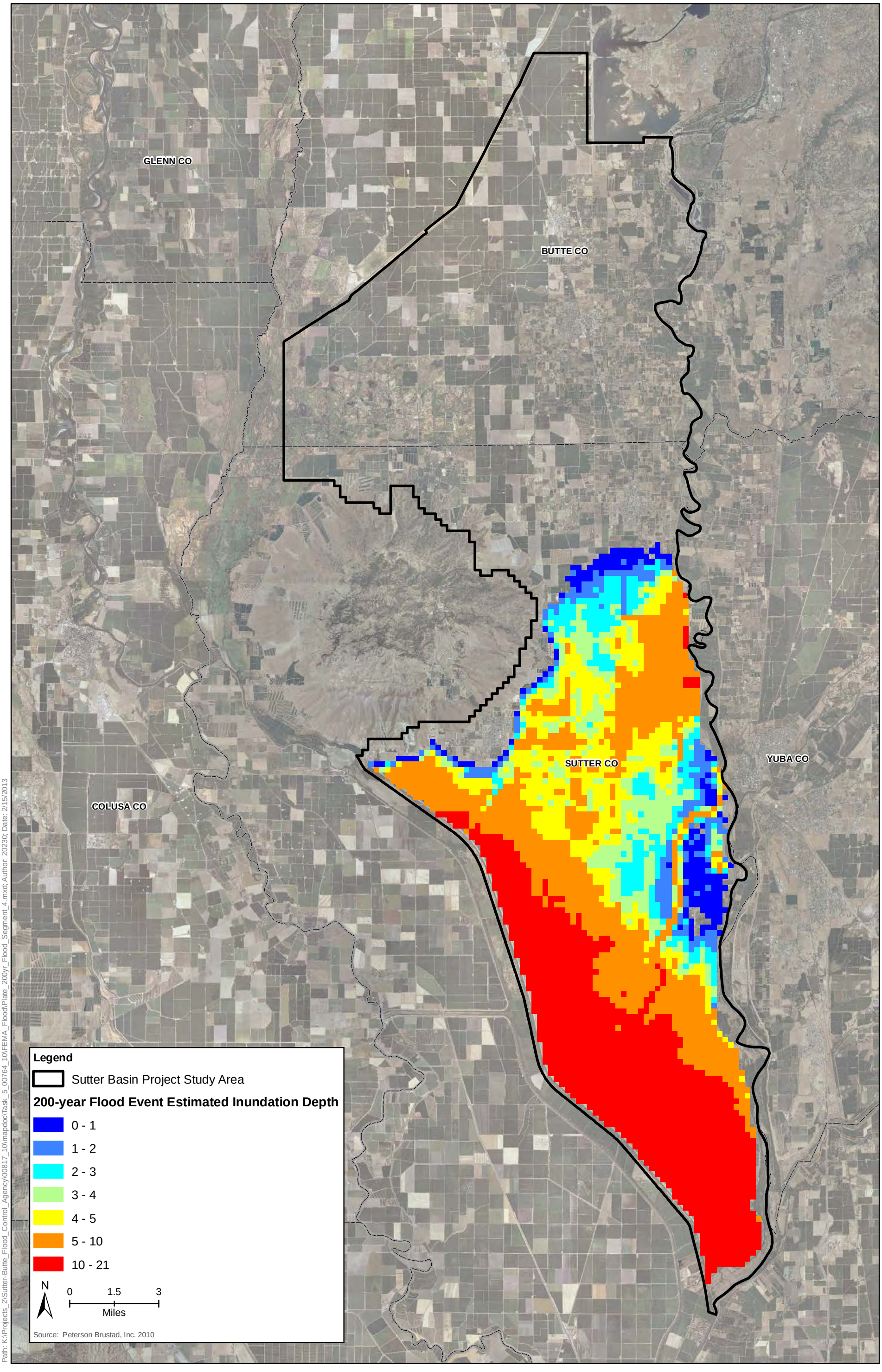

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Plate 2-16
200-year Flood Event Estimated Inundation Depth - Segment 4

GLENN CO

BUTTE CO

SUTTER CO

YUBA CO

COLUSA CO

Legend

Sutter Basin Project Study Area

200-year Flood Event Estimated Inundation Depth

0 - 1

1 - 2

2 - 3

3 - 4

4 - 5

5 - 10

10 - 25

N

0 1.5 3

Miles

Source: Peterson Brustad, Inc. 2010

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\FEMA_Flood\Plate_200yr_Flood_Segment_5.mxd; Author: 20230; Date: 2/15/2013

Plate 2-17

200-year Flood Event Estimated Inundation Depth - Segment 5

GLENN CO

BUTTE CO

COLUSA CO

SUTTER CO

YUBA CO

Legend

Sutter Basin Project Study Area

200-year Flood Event Estimated Inundation Depth

- 0.010 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- 10 - 22

N

0 1.5 3

Miles

Source: Peterson Brustad, Inc. 2010

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\FEMA_Flood\Plate_200yr_Flood_Segment_6.mxd Author: 20230; Date: 2/15/2013

Plate 2-18

200-year Flood Event Estimated Inundation Depth - Segment 6

GLENN CO

BUTTE CO

COLUSA CO

SUTTER CO

YUBA CO

Legend

Sutter Basin Project Study Area

200-year Flood Event Estimated Inundation Depth

- 0.050 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 10
- 10 - 22

N

0 1.5 3

Miles

Source: Peterson Brustad, Inc. 2010

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\FEMA_Flood\Plate_200yr_Flood_Segment_7.mxd Author: 20230; Date: 2/15/2013

Plate 2-19

200-year Flood Event Estimated Inundation Depth - Segment 7

GLENN CO

BUTTE CO

Re-Mapping Currently Underway

SUTTER CO

YUBA CO

COLUSA CO

Legend

FRWLP Study Area

Sutter Basin Project Study Area

FEMA Flood Zones

Zone A = Subject to inundation by 100-year flood event.
FEMA Base Flood Elevations (BFE) have not been determined.

Zone AE = Subject to inundation by 100-year flood event.
FEMA BFE have been determined.

Zone AH = Subject to inundation by 1% annual-chance shallow flooding (usually areas of ponding) with average depths of between 1-3 feet.

Zone AO = Subject to inundation by 1% annual-chance shallow flooding (usually sheet flow on sloping terrain) with average depths of between 1-3 feet.

Zone D = Possible but undetermined flood hazards—no flood hazards analysis has been conducted.

Unshaded Zone X: Areas to be determinde to be outside the 0.2% annual chance floodplain

Shaded Zone X: Areas of .2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 sq miles; and areas protected by levees from 1% annual chance flood

Area Not Included

Re-Mapping Currently Underway

N

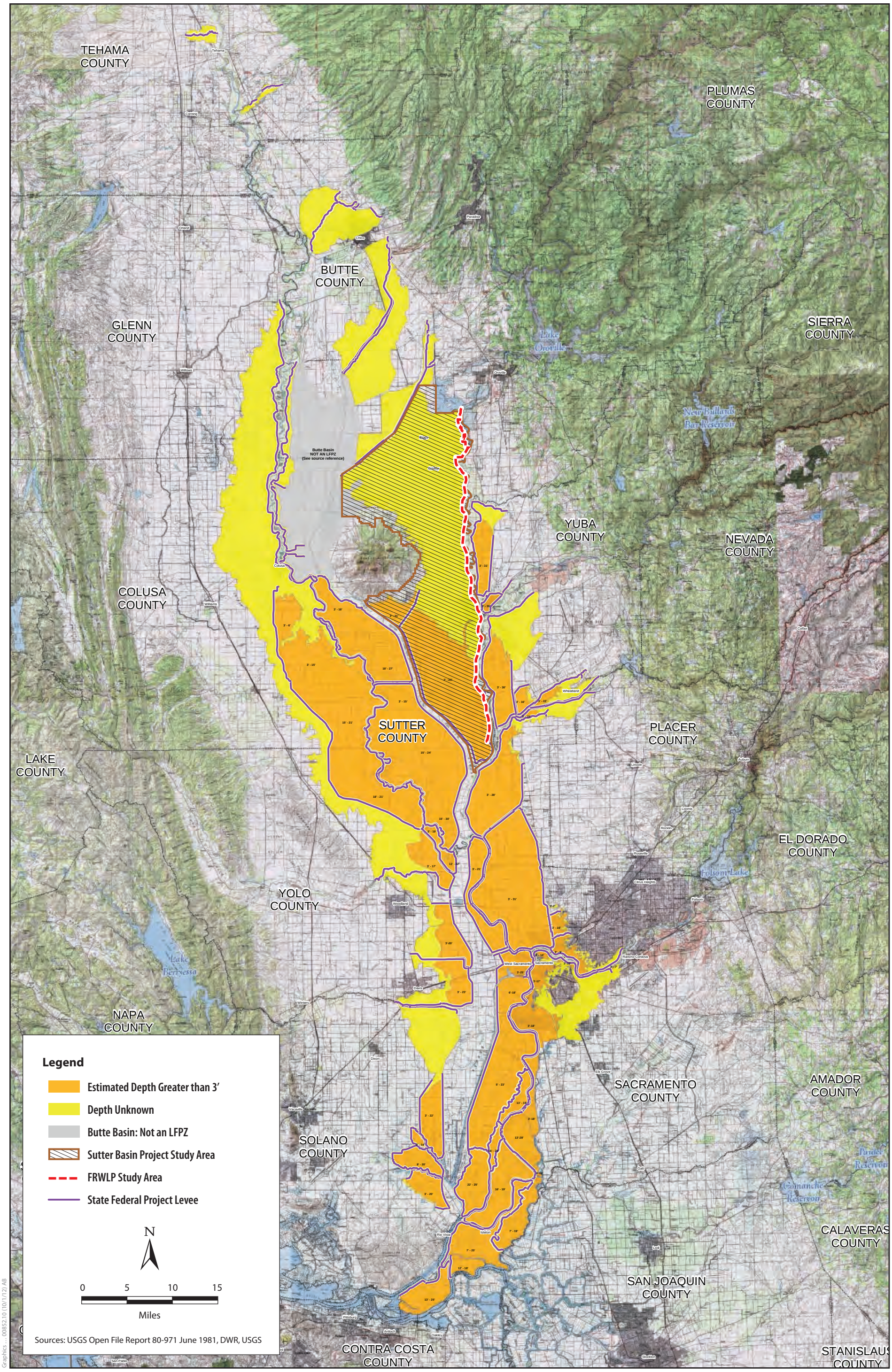
0 2 4 8

Miles

Source: National Flood Hazard Layer (NFHL), FEMA, 2011.

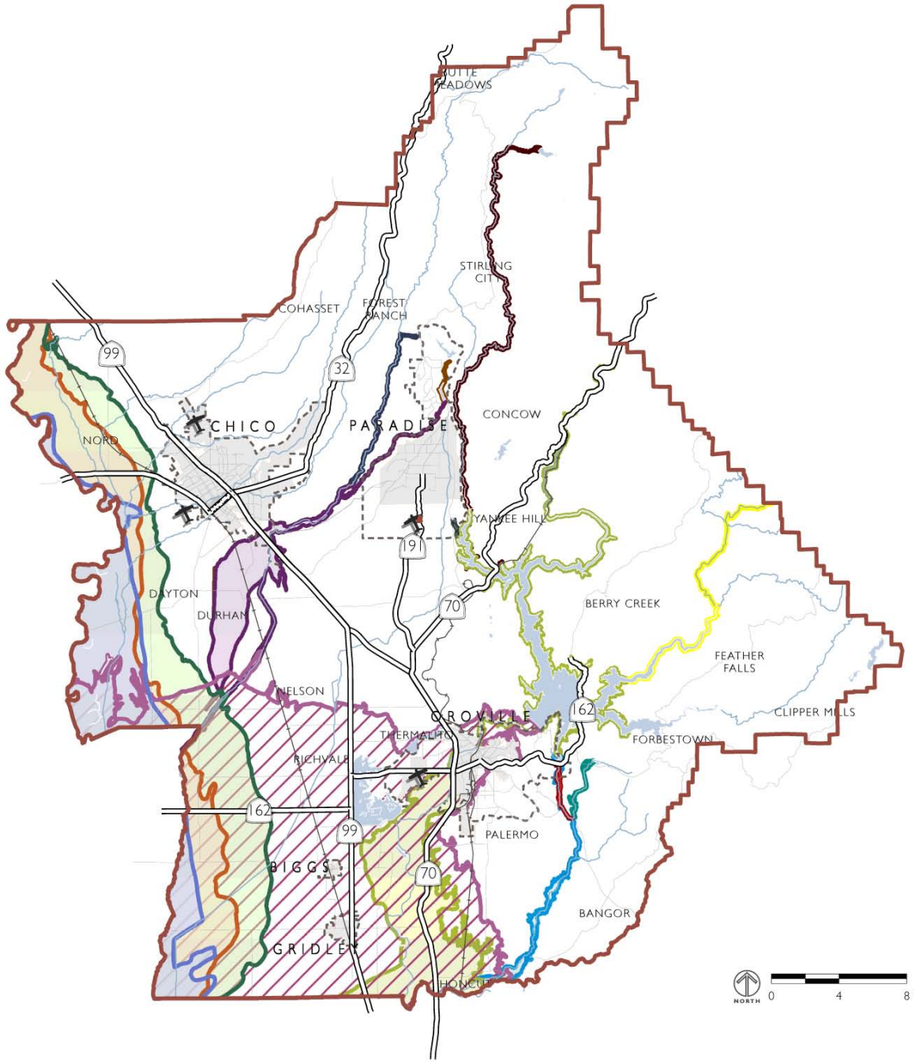
Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\FEMA_FloodPlate_2_20_FEMA_Flood_20121001.mxd; Author: 20230; Date: 10/1/2012

Plate 2-20
FEMA Zones



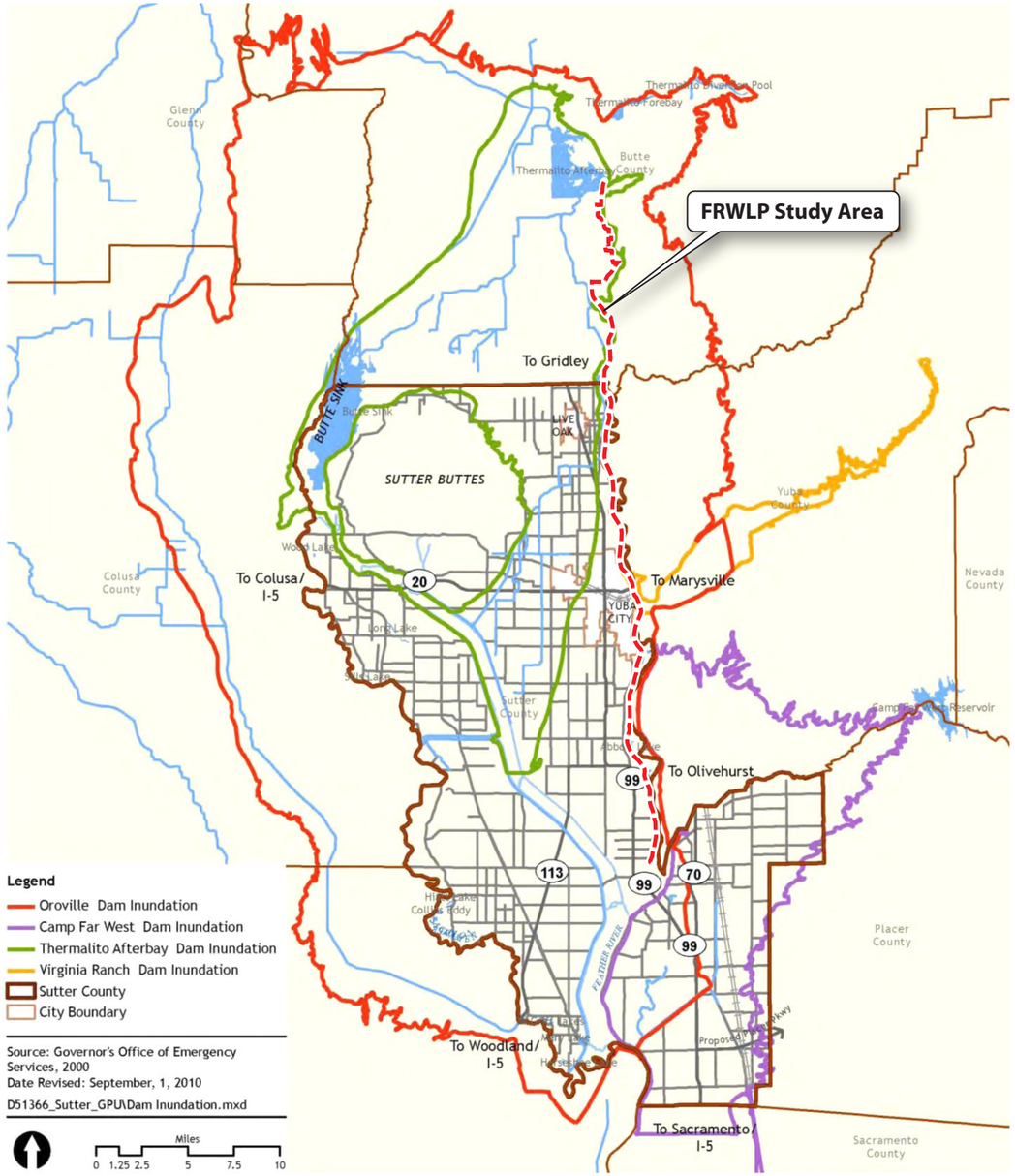
Graphics ... 00852.10 (10/1/12) AB

Plate 3.1-1
Levee Flood Protection Zones



Sources: Butte County Geographic Information Systems, 2009; California Office of Emergency Services, 2006.

- Airports
- Highways
- Railroad
- Major Roads
- Sphere of Influence
- City/Town Limits
- County Boundary
- Black Butte Dam Inundation Area
- Whiskeytown Dam Inundation Area
- Shasta Dam Inundation Area
- Lake Oroville Dam Inundation Area
- Lake Almanor Dam Inundation Area
- Kunkle Dam Inundation Area
- Frenchman Dam Inundation Area
- Magalia Dam Inundation Area
- Paradise Dam Inundation Area
- DeSalba Dam Inundation Area
- Philbrook Dam Inundation Area
- Miner's Ranch Dam Inundation Area
- Bidwell Bar Dam Inundation Area
- Lake Wyandotte Dam Inundation Area



Legend

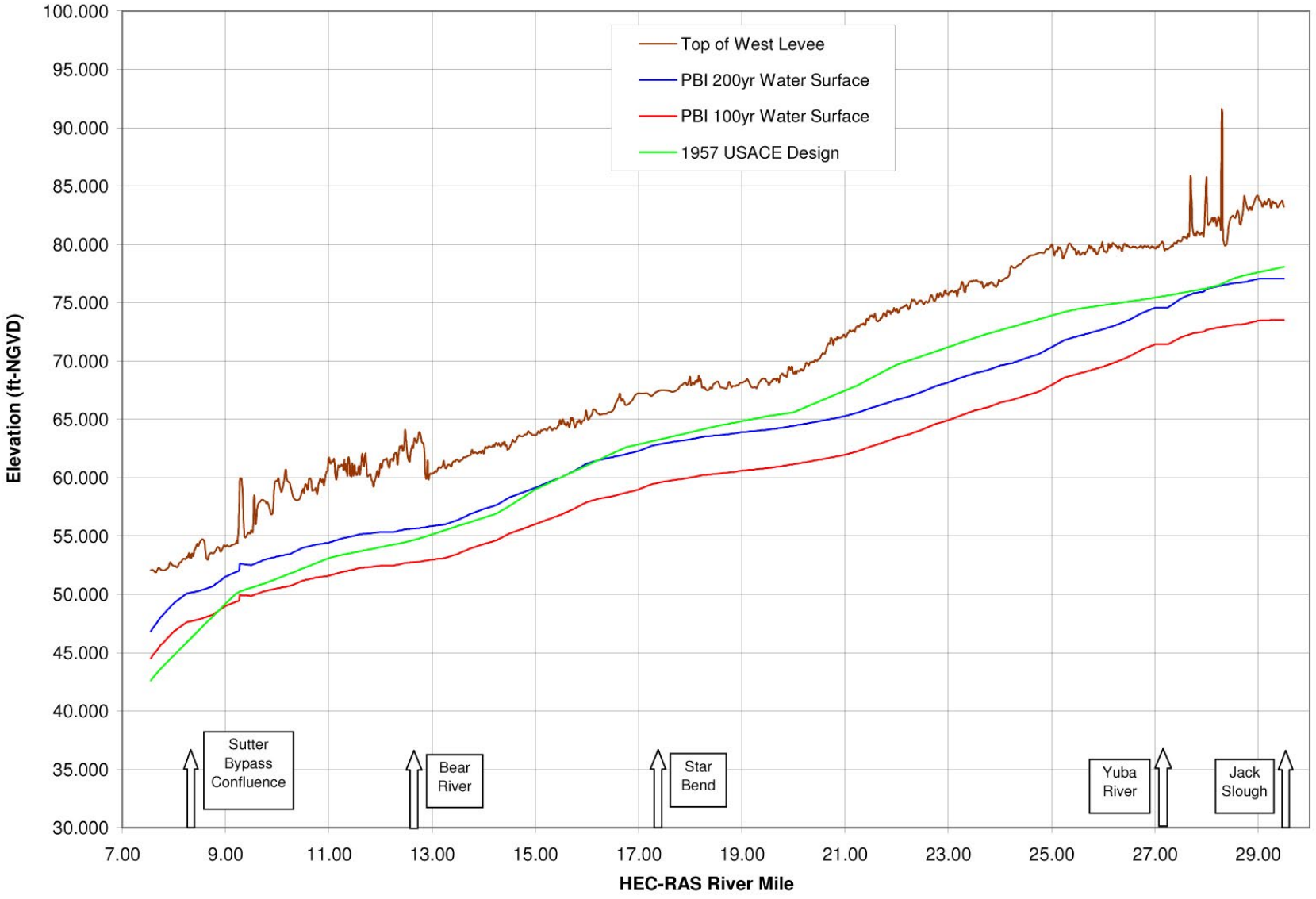
- Oroville Dam Inundation
- Camp Far West Dam Inundation
- Thermalito Afterbay Dam Inundation
- Virginia Ranch Dam Inundation
- Sutter County
- City Boundary

Source: Governor's Office of Emergency Services, 2000
Date Revised: September, 1, 2010
D51366_Sutter_GPU\Dam Inundation.mxd

Miles
0 1.25 2.5 5 7.5 10

Graphics: ...00852\10 (6/19/12) AB

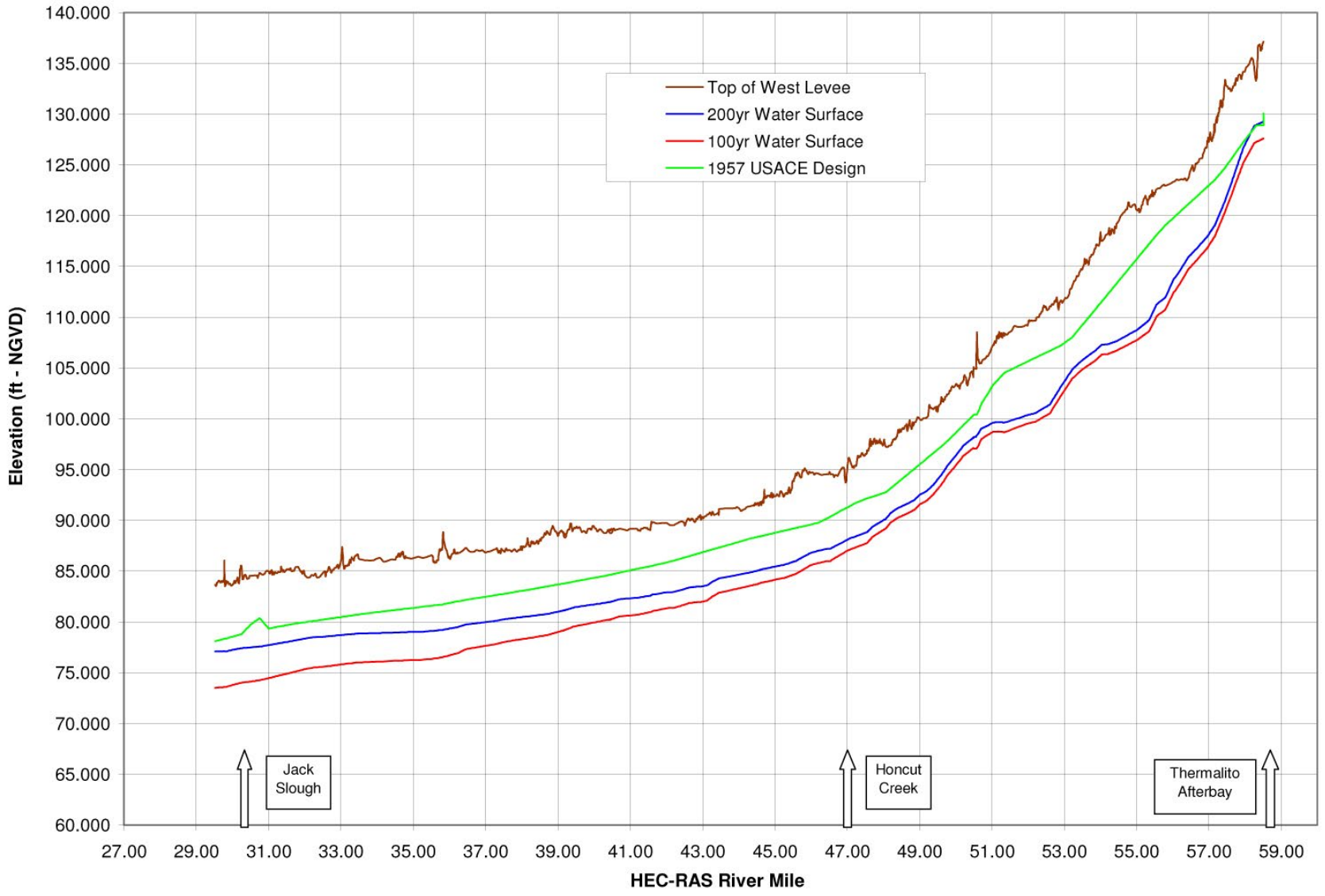
Plate 3.1-2
Dam Inundation Areas



Source: Peterson Brustad, Inc. 2010. Sutter Butte Flood Control Agency's Early Implementation Program Project Report for the Feather River West Levee Rehabilitation Project. Figure 9

Graphics ... 00852.10 (10/1/12)

Figure 3.1-3
Lower Feather River Freeboard Profile



Source: Peterson Brustad, Inc. 2010. Sutter Butte Flood Control Agency's Early Implementation Program Project Report for the Feather River West Levee Rehabilitation Project. Figure 8

Graphics ... 00852.10 (10/1/12)

Plate 3.1-4
Upper Feather River Freeboard Profile

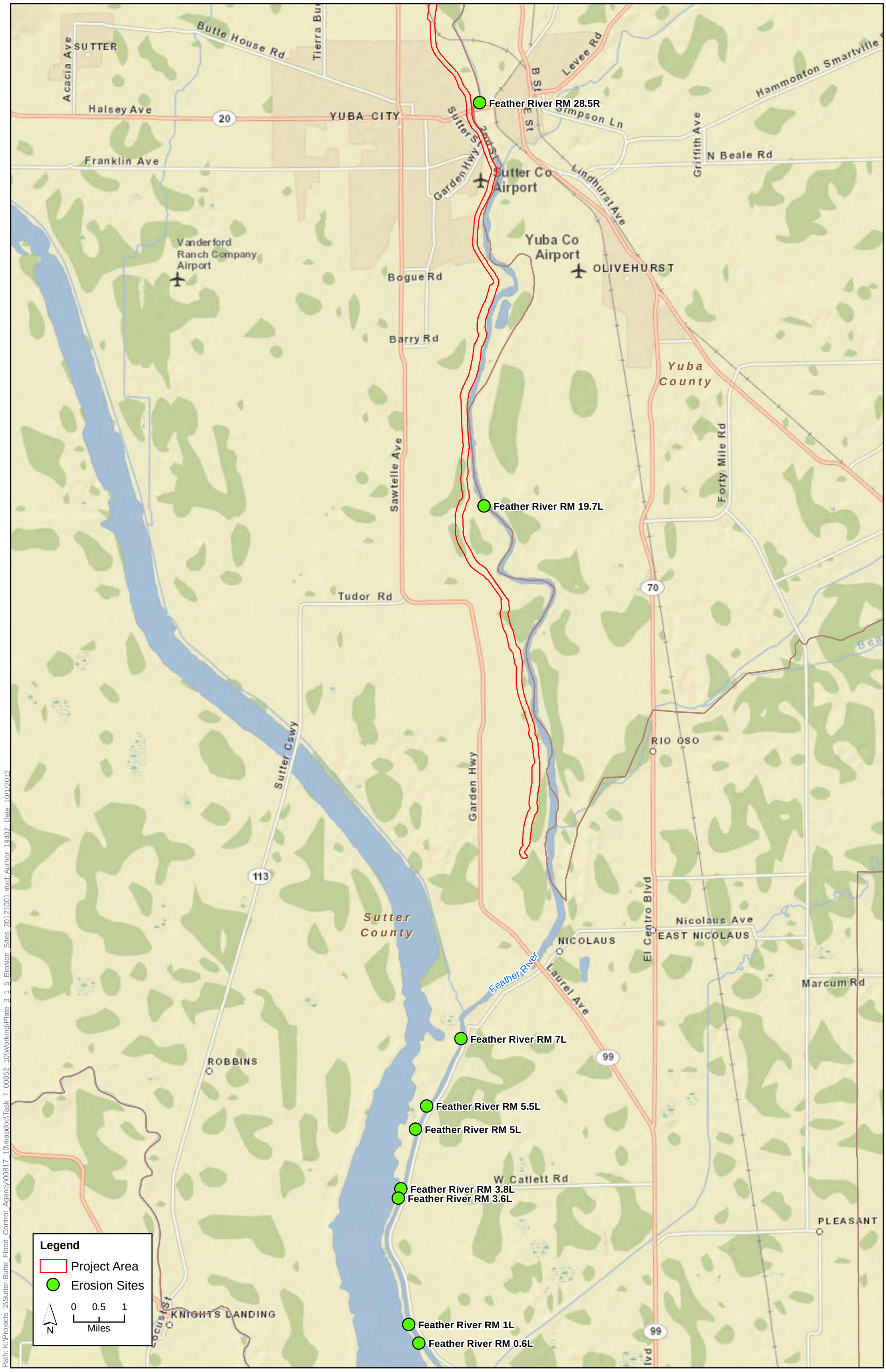


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Plate 3.1-5
Erosion Sites

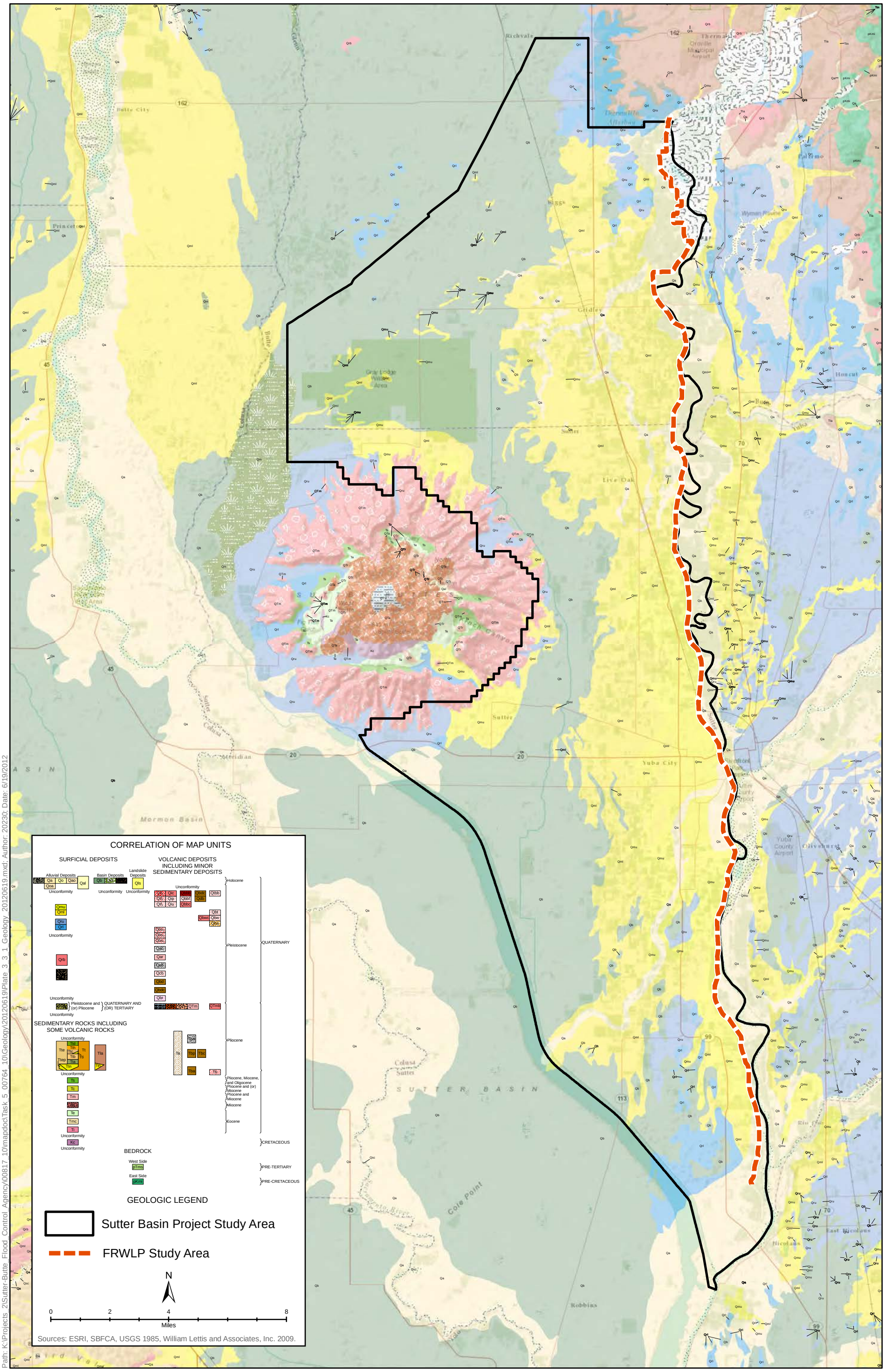


Plate 3.3-1
General Geologic Map

Cleveland Hill Fault

Green Valley fault

SACRAMENTO VALLEY

SUTTER BUTTES

COLUSA BASIN

SUTTER BASIN

AMERICAN BASIN

DUNNIGAN HILLS

HUNGRY HOLLOW

SACRAMENTO

Roseville

Chico

Oroville

Yuba City

Marysville

Woodland

Davis

Fairfield

Vacaville

Dixon

Lincoln

Rocklin

Auburn

Grass Valley

Nevada City

Beale Air Force Base

Mud Springs Plains

Lake Red Bluff Recreation Area

Woodson Bridge State Rec Area

Lake Oroville State Recreation Area

Bucks Lake

Mount Ararat

Big Bend Mountain

North Table Mountain

Oregon Hills

Hammon Grove Park

Empire Mine State Historic Park

Folsom Lake State Recreation Area

Maidu Regional Park

Gibson Ranch County Park

Cache Creek Canyon Regional Park

Elk Grove Regional Park

Discovery Park

William Land Park

Granite Park

Del Paso Park

Hagan Park

Rancho Cordova

Carmichael

Fair Oaks

Orangevale

Citrus Heights

North Highlands

Folsom

El Dorado Hills

Rio Linda

Ryer Island

Staten Island

Brannan Island

Lake Berryessa

Doe Mill Ridge

Chasset Ridge

Indian Valley

Middle Fork Feather

North Fork

Bear Valley

Glenn

Lassen

Placer

Sutter

Yolo

Sacramento

English Hills

Suisun City

Elk Grove

Galt

Lodi

Folsom

Red Hill

2397 m

2285 m

1761 m

2187 m

1938 m

1371

1316 m

660 m

655 m

645 m

679 m

973 m

925 m

932 m

399 m

43 m

Legend

- Sutter Basin Project Study Area
- FRWLP Study Area

Quaternary Fault Age (years)

- <150
- <15,000
- <130,000
- <1,600,000

- Helley and Hardwood Fault

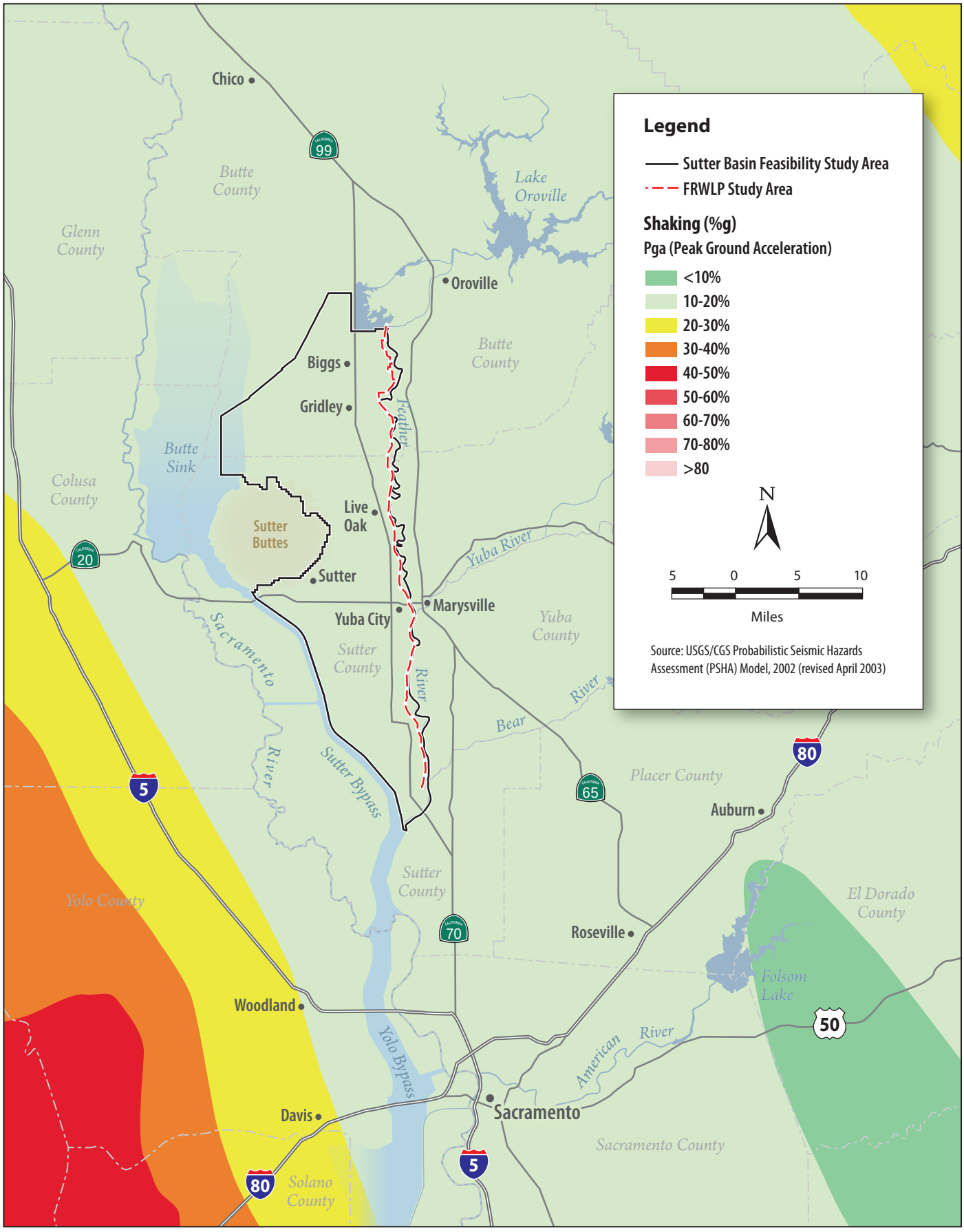
N

0 2 4 8
Miles

Sources: ESRI, SBFCA, USGS 1985 & 2003.

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\Geology\20120619\Plate_3_3_2_Faults_20120619.mxd; Author: 20230; Date: 6/19/2012

Plate 3.3-2
Geologic Faults Near the Study Area



Graphics ... 00852.10 (6/19/12) AB

Plate 3.3-3
Minimum Peak Horizontal Ground Acceleration in the Study Area Vicinity

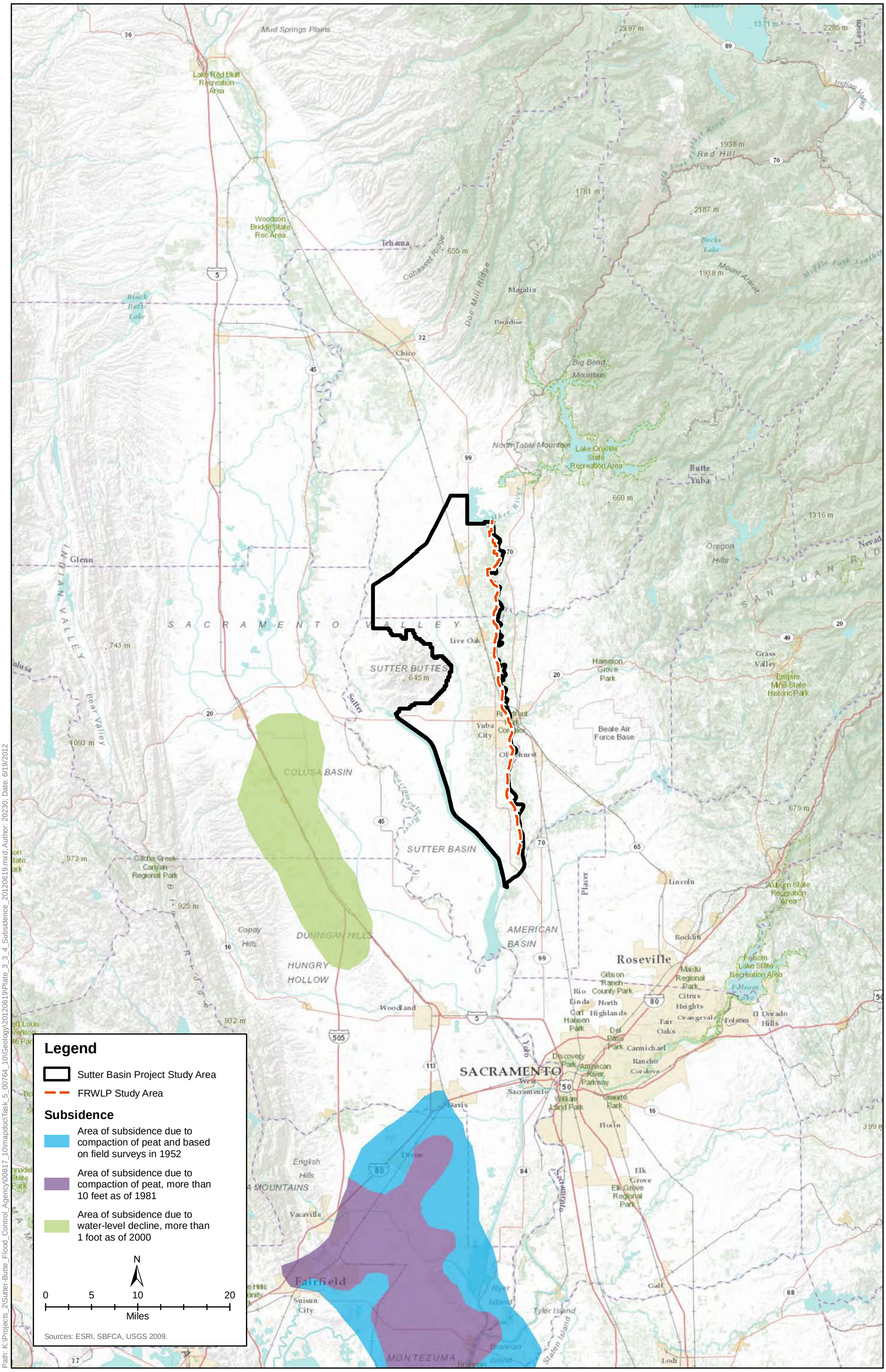


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Plate 3.3-4
Subsidence in the Study Area Vicinity

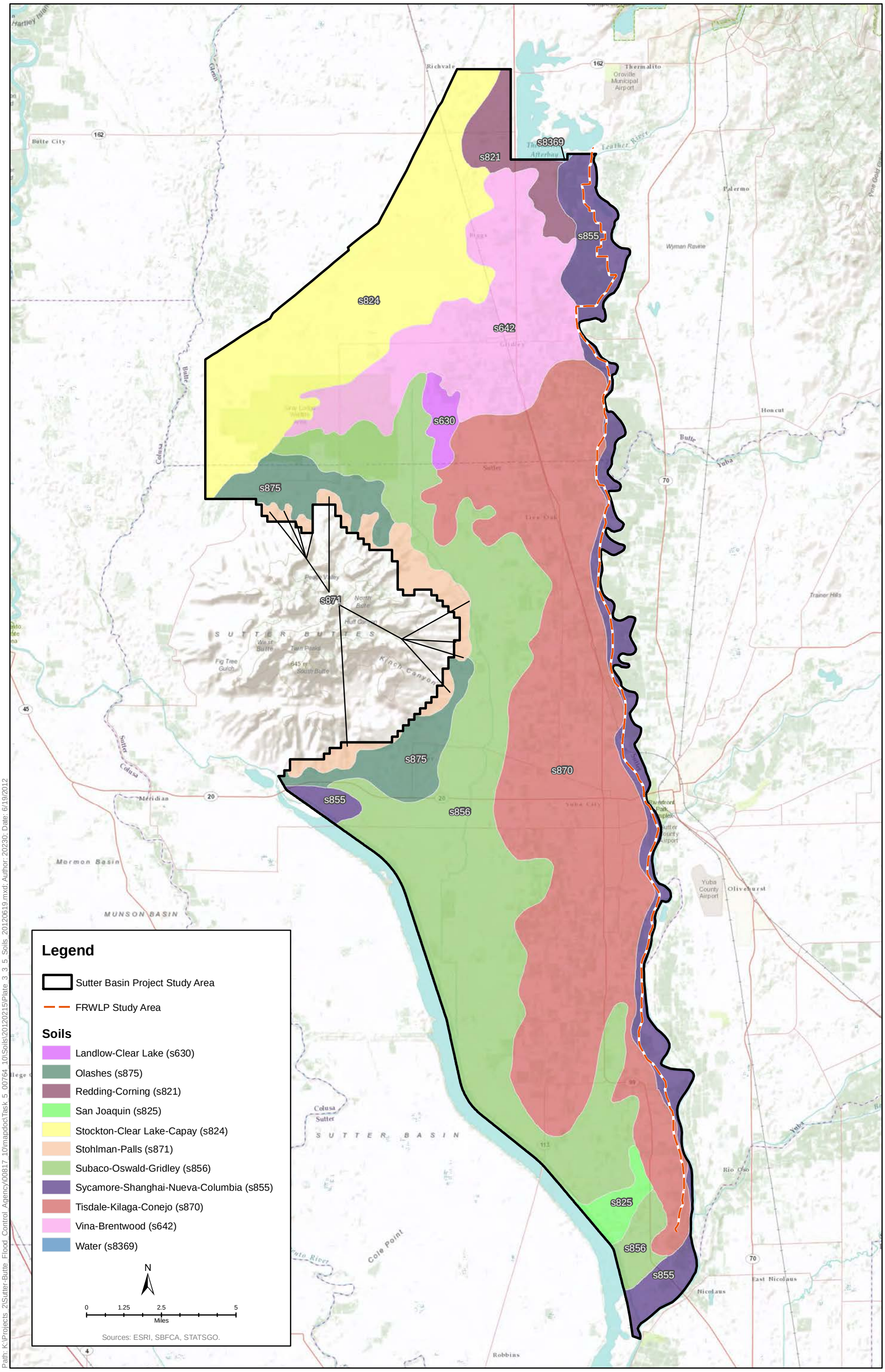

Plate 3.3-5
Soils in the Study Area

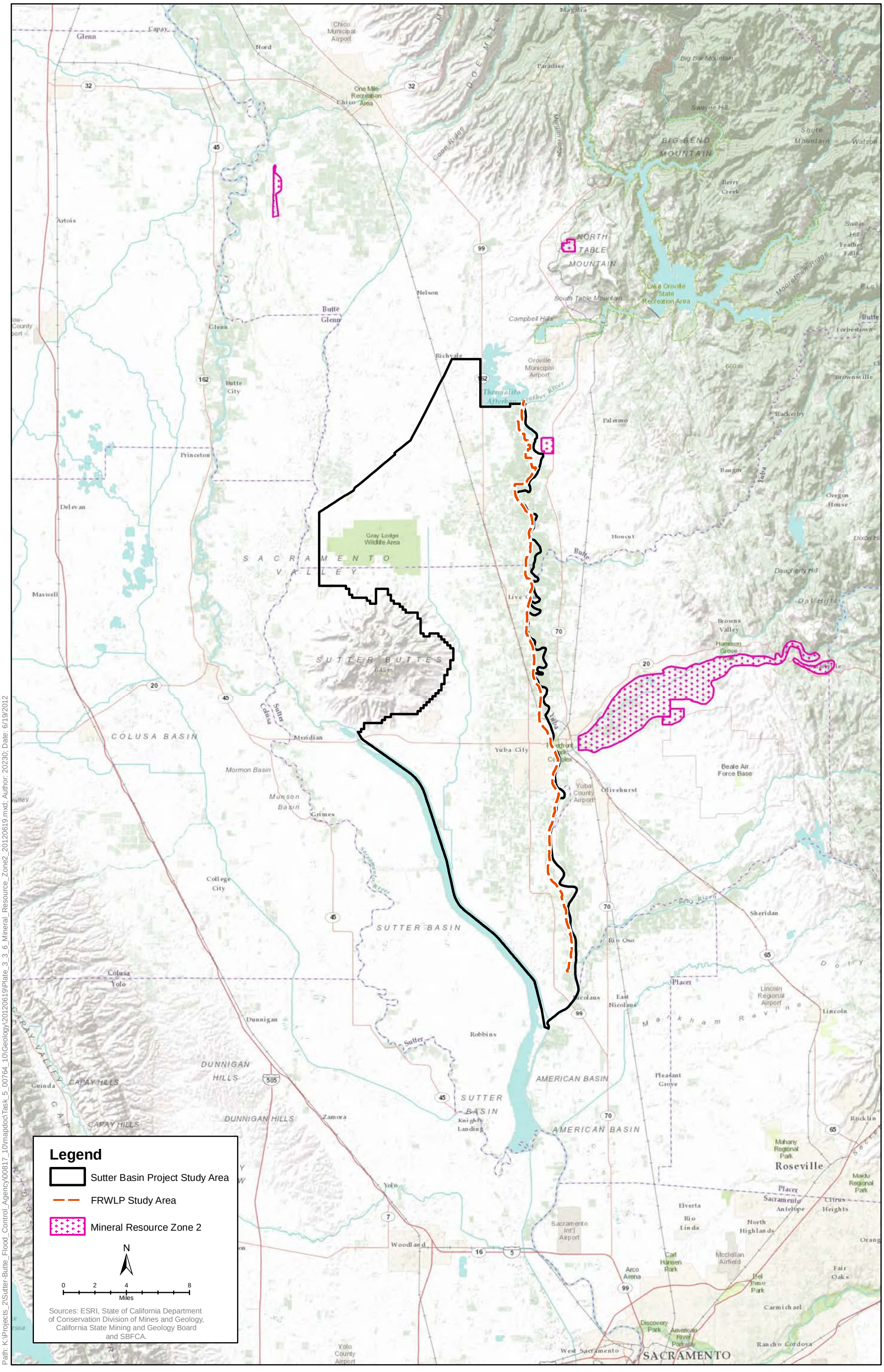

Plate 3.3-6
Mineral Resource Zone 2 in the Study Area Vicinity

AGGREGATE AVAILABILITY IN NORTHERN CALIFORNIA

Fifty-Year Aggregate Demand Compared to Permitted Aggregate Resources

Fifty-Year Aggregate Demand Compared to Permitted Aggregate Resources*

The pie diagrams show the projected 50-year demand for aggregate as of January 2006 compared to currently permitted aggregate resources (in short tons). The 50-year demand for a particular study area is graphically represented by one of four pie diagram sizes. Study area boundaries are shown on the index map of aggregate studies (lower left).

** Permitted aggregate resources (also called aggregate reserves) are those portions of the resources for which local lead agencies (counties and cities) have issued mining permits. Non-permitted aggregate resource information is given in each aggregate study report. See accompanying text for references to these reports.*

Map Usage and Limitations

This map is intended to provide general information about the current availability of California's permitted construction aggregate resources to state, regional, and local land-use planners and decision-makers. It is designed to assist planning agencies in considering construction aggregate needs in the regional planning process. However, the map is not intended to be used as the sole source of information about construction aggregate availability, or as the basis for site-specific land-use decisions. Although the statewide and regional information on this map may be useful to local decision-makers, the more detailed information contained in the referenced aggregate studies should be used for local land-use decision-making purposes.

Legend

50-year demand that will not be met by existing permitted resources.
Permitted aggregate resources.

50-year demand is 25 to 200 million tons.

50-year demand is > 200 to 500 million tons.

50-year demand is > 500 to 800 million tons.

50-year demand is more than 800 million tons.

Examples

50-year demand for aggregate is 100 million tons; permitted resources total 25 million tons of the 50-year demand.

25/100 Million Tons (permited resources/ 50-year demand)

50-year demand for aggregate is 510 million tons; permitted resources are greater than or equal to the 50-year demand.

550/510 Million Tons (permited resources/ 50-year demand)

Areas With Short Term Aggregate Supply

< 10 years of permitted resources remaining in the study area.

Aggregate Production Areas

(Symbols represent one or more aggregate mines, tonnage represents 2005 annual production)

- < 0.5 Million Tons per Year
- 0.5 - 2 Million Tons per Year
- >2 - 5 Million Tons per Year
- >5 - 10 Million Tons per Year
- >10 Million Tons per Year

Population

1 Dot = 100 Persons
(based on 2000 Census Data)

- City
- Interstate Route
- U.S. Route
- State Route
- Primary Highway
- Secondary Highway
- County Boundary

N

20 0 20 40 60
Miles

20 0 20 40 60
Kilometers

Scale: 1:1,100,000

Projection: Teale Albers
Datum: NAD 27

Source: California Geological Survey 2006.

Graphics...00852.10 (6/19/12) AB

Plate 3.3-7
Aggregate Demand and Availability in Northern California and the Study Area

Legend

Sutter Basin Project Study Area

FRWLP Study Area

Oil and Gas Wells

Abandoned Producer

Active Injector

Active Producer

N

0 1.25 2.5 5

Miles

Sources: ESRI, SBFCA, State of California Department of Conservation, Division of Oil, Gas, and Geothermal Resources.

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_5_00764_10\Geology\20120619\Plate_3_3_8_Oil_and_Gas_20120619.mxd Author: 20230, Date: 6/19/2012

Plate 3.3-8
Oil and Gas Wells Within the Study Area

Bellevue Ave

Laurel Ave

Oak Ave

Cypress Ave

202+50

218+66

3

Map Sheet Index

113

South Yuba City

Yuba City

20

Marysville

Linda

Olivehurst

70

65

99

162

Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 1

0 250 500

Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Bio_Field_Maps\Plate_3-8-1_Landcover_20130502.mxd; Author: 19402; Date: 5/2/2013

Cypress Ave

Clayton Ave

Central Ave

300+66 4

Map Sheet Index

113

99

162

South Yuba City

Yuba City

20

Marysville

Linda

Olivehurst

70

65

Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 2

0 250 500

Feet

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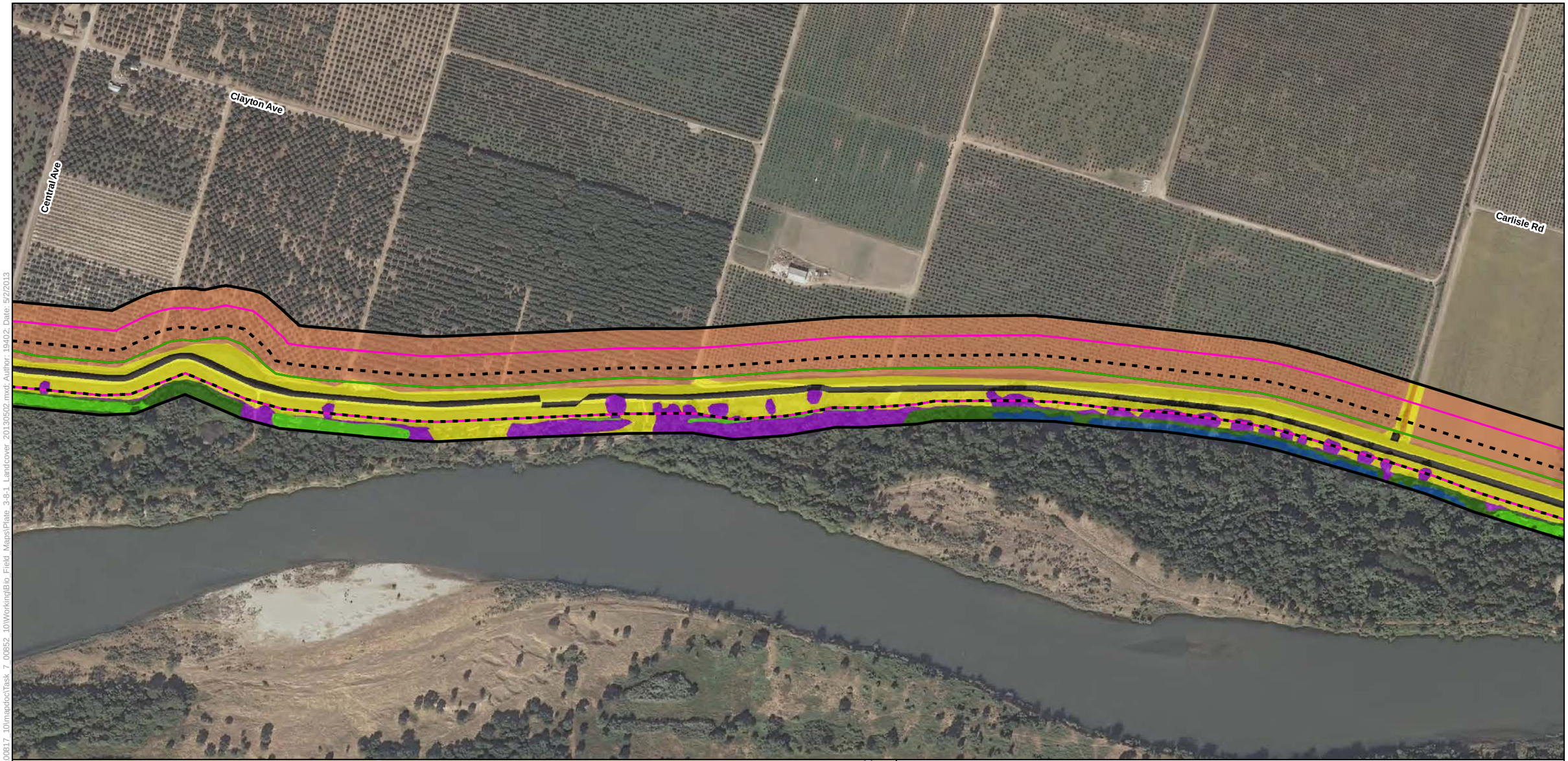

Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 3

0 250 500
Feet

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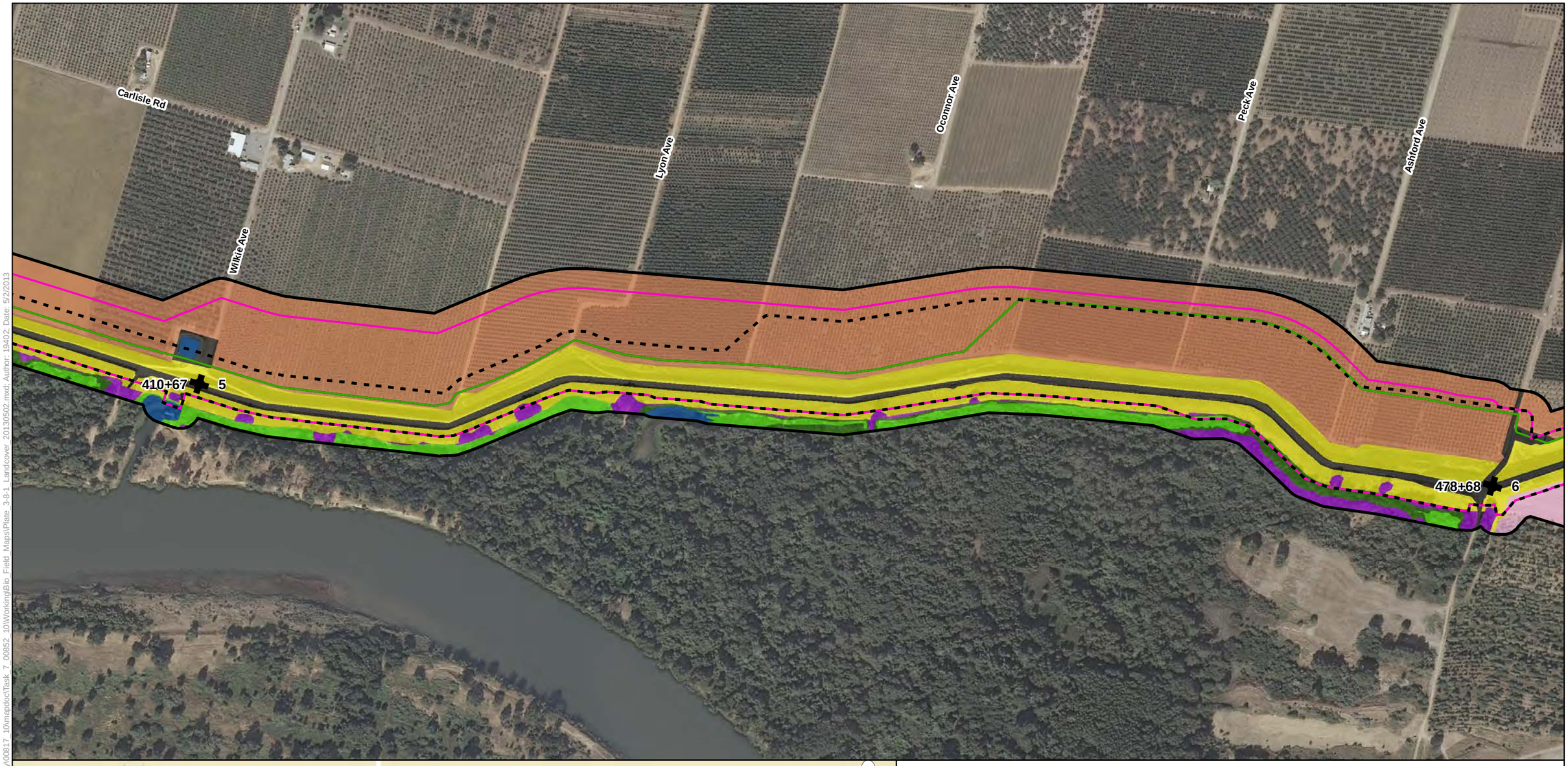

Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 4

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Ashford Ave
Shannon Rd
Star Bend Rd
Garden Hwy
6
510+37
7

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Biological Study Area
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Alternative 3
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Land Cover Types
Developed
Ditch/Canal
Field and Row Crops
Forested/Shrub Wetland
Oak Woodland
Open Water
Orchard
Pond/Basin
Riparian Forest
Riparian Scrub-Shrub
Ruderal
Seasonal Wetlands
Stream/River
Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 5

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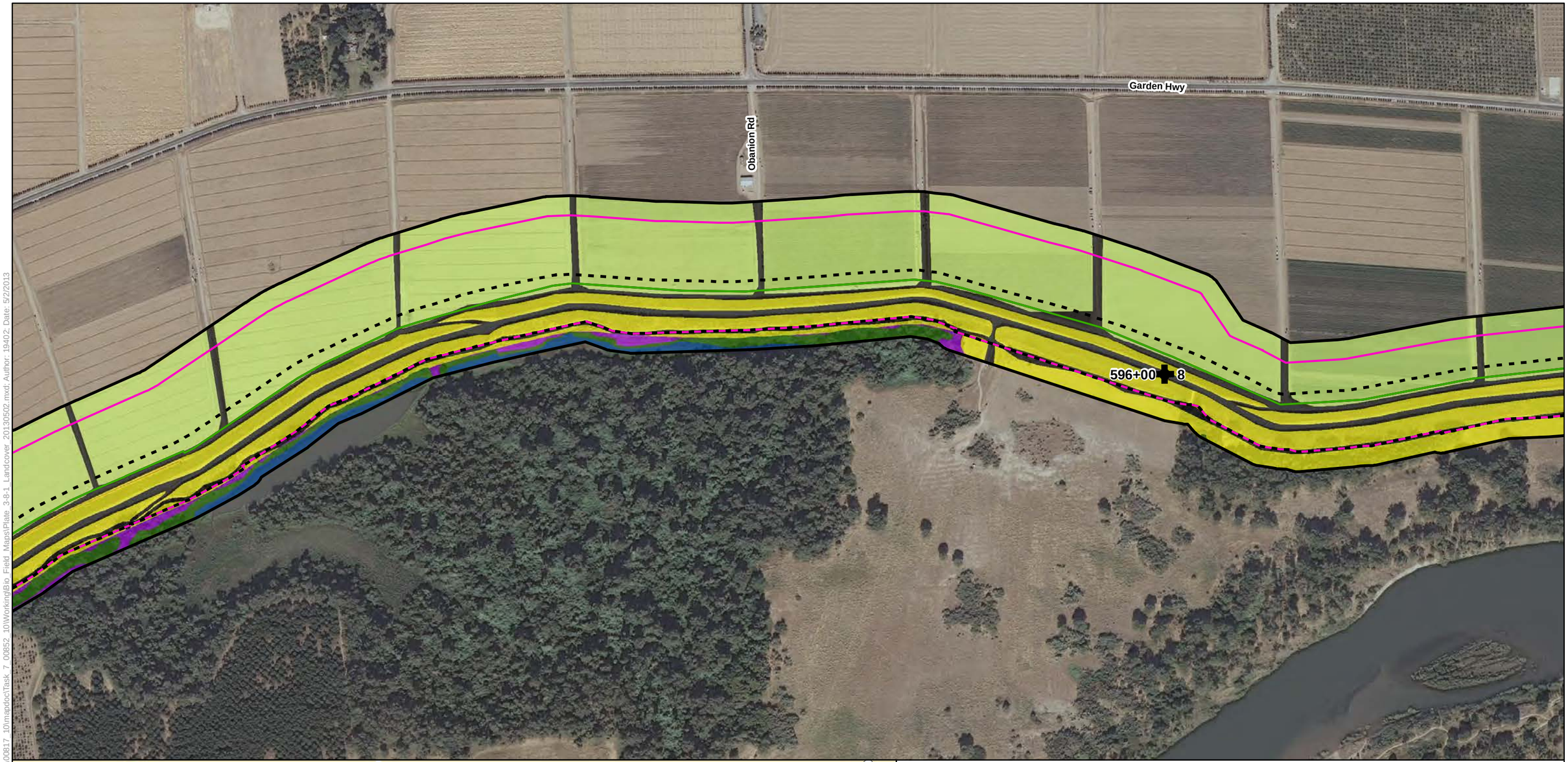

Legend

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- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
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- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
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- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 6

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Legend

- Biological Study Area
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Land Cover Types

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Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 7

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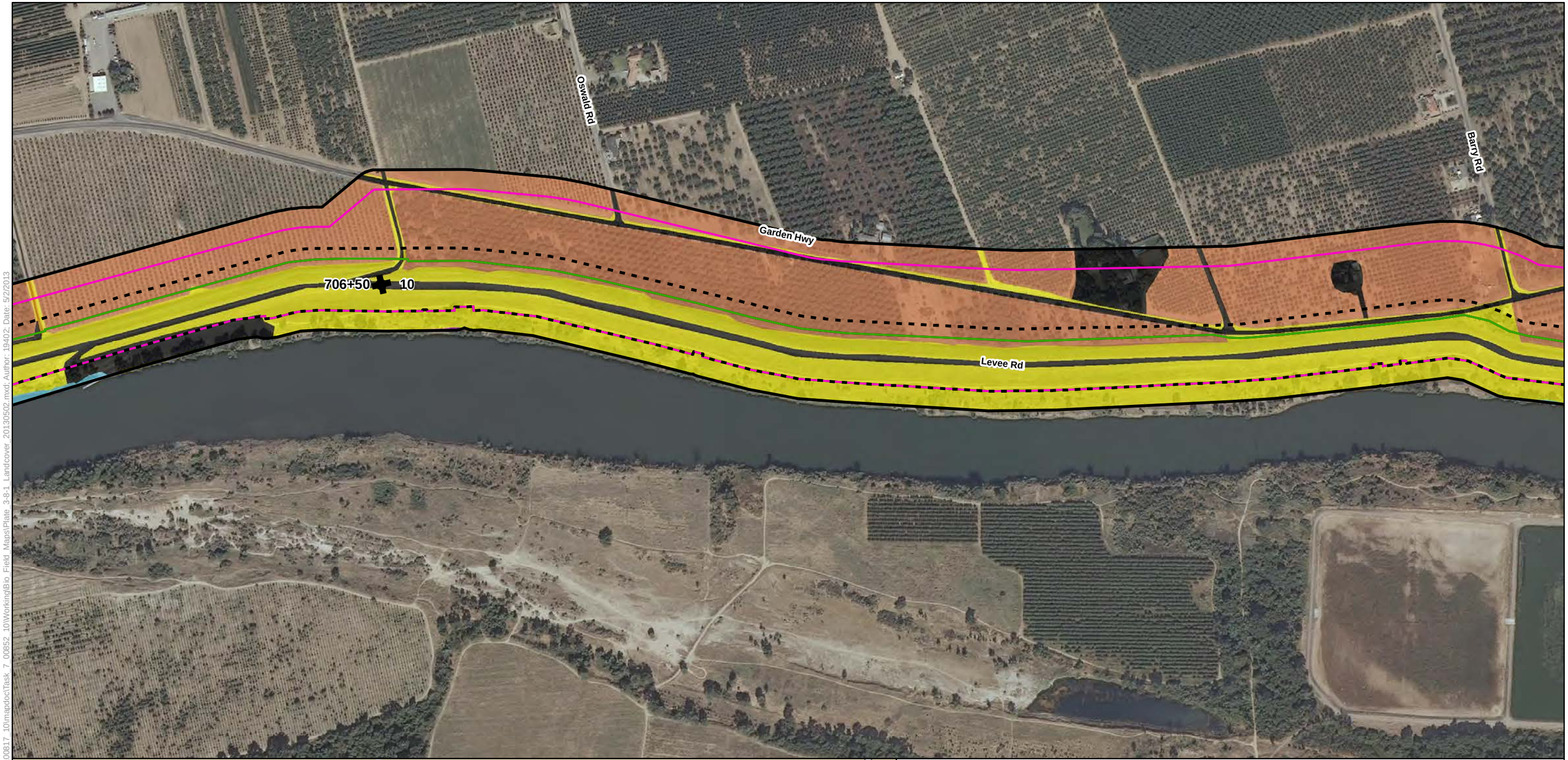

Legend

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Land Cover Types

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- Ditch/Canal
- Field and Row Crops
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- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
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Plate 3.8-1
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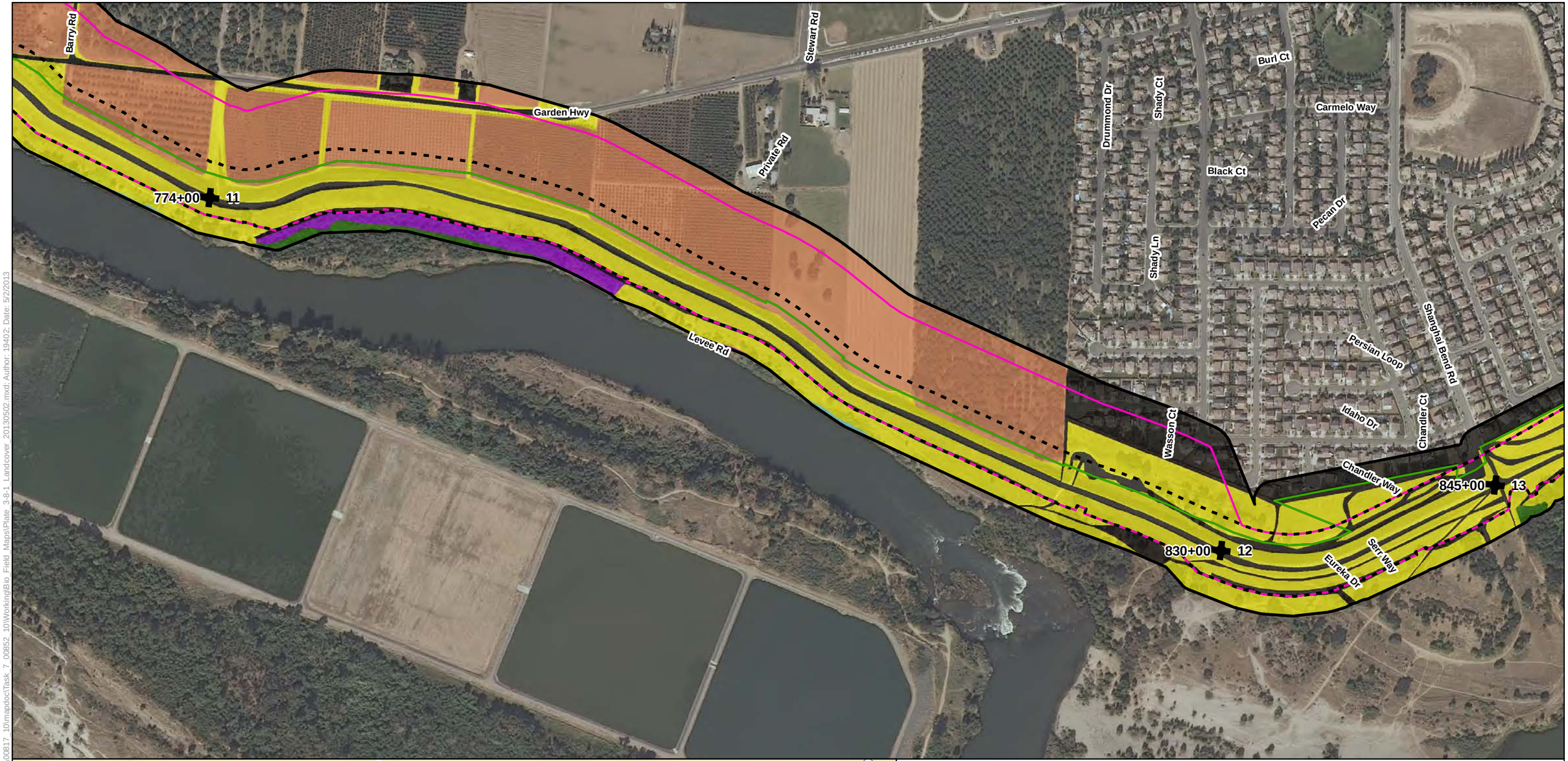

Legend

- Biological Study Area
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Land Cover Types

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Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

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Wild River Dr
Crystal Creek Ln
Bogue Rd
Lonely Oak St
Edgewater Way
Rocky Ct
Rapid Water Way
Burns Dr
Epley Dr
Putman Ave
Private Rd
Levee Rd
Idaho Dr
845+00
13
Shanghai Bend Rd
Eureka Dr

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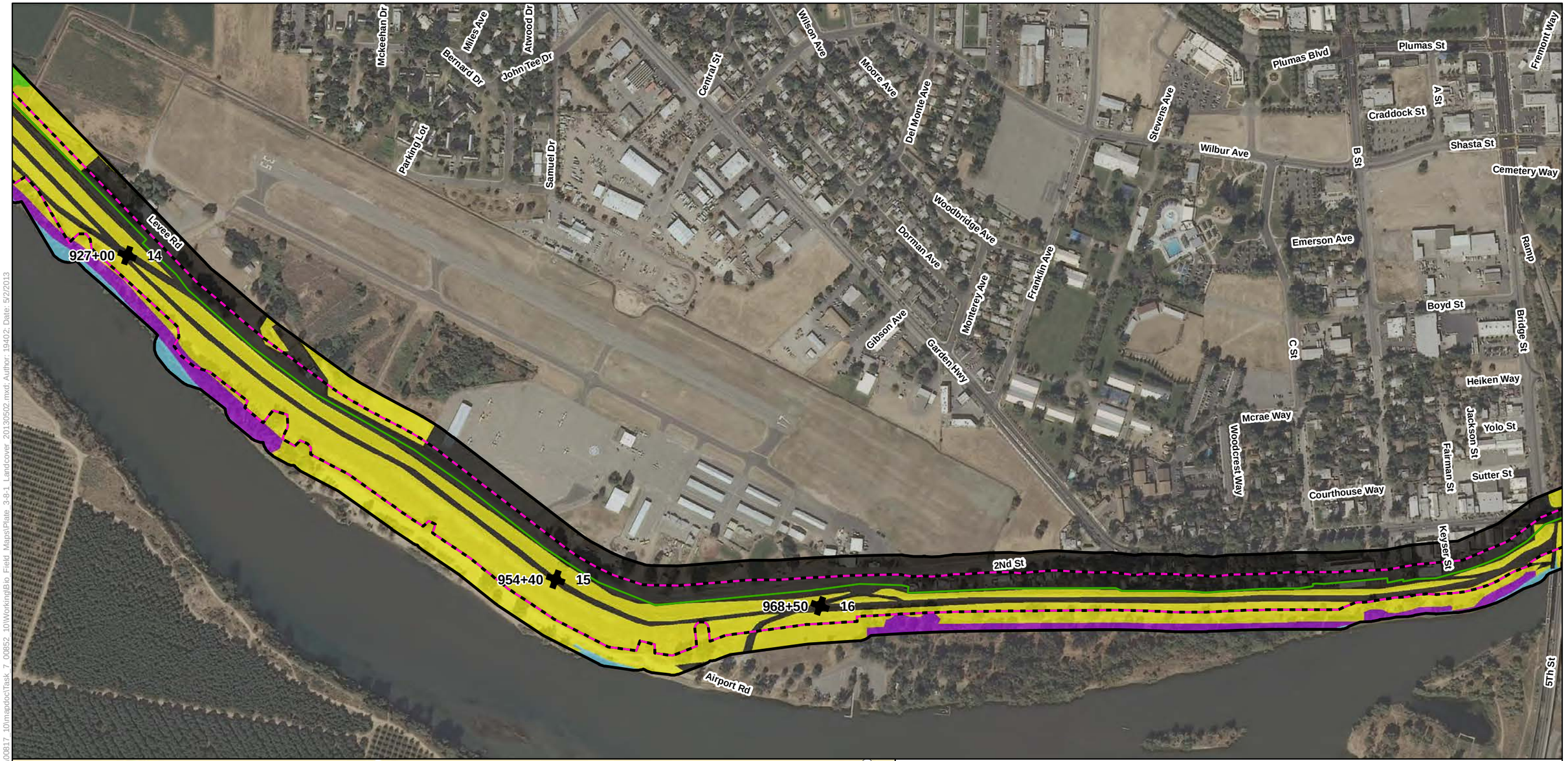

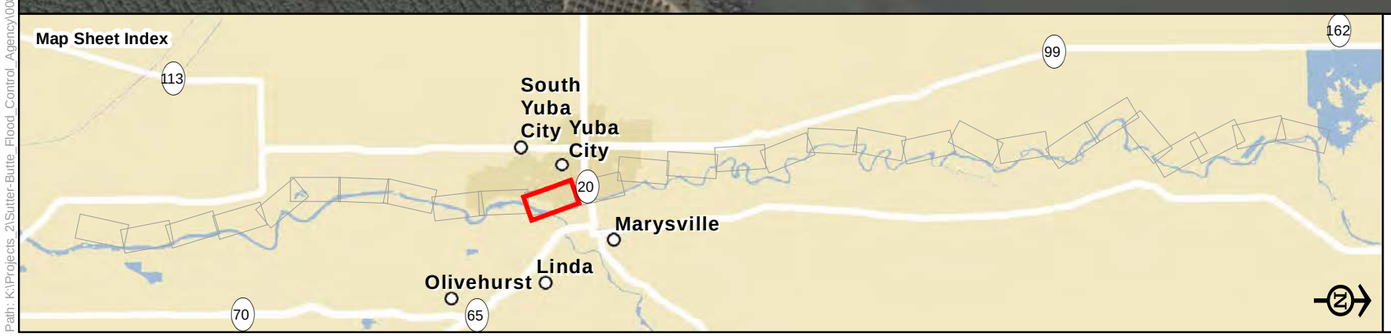

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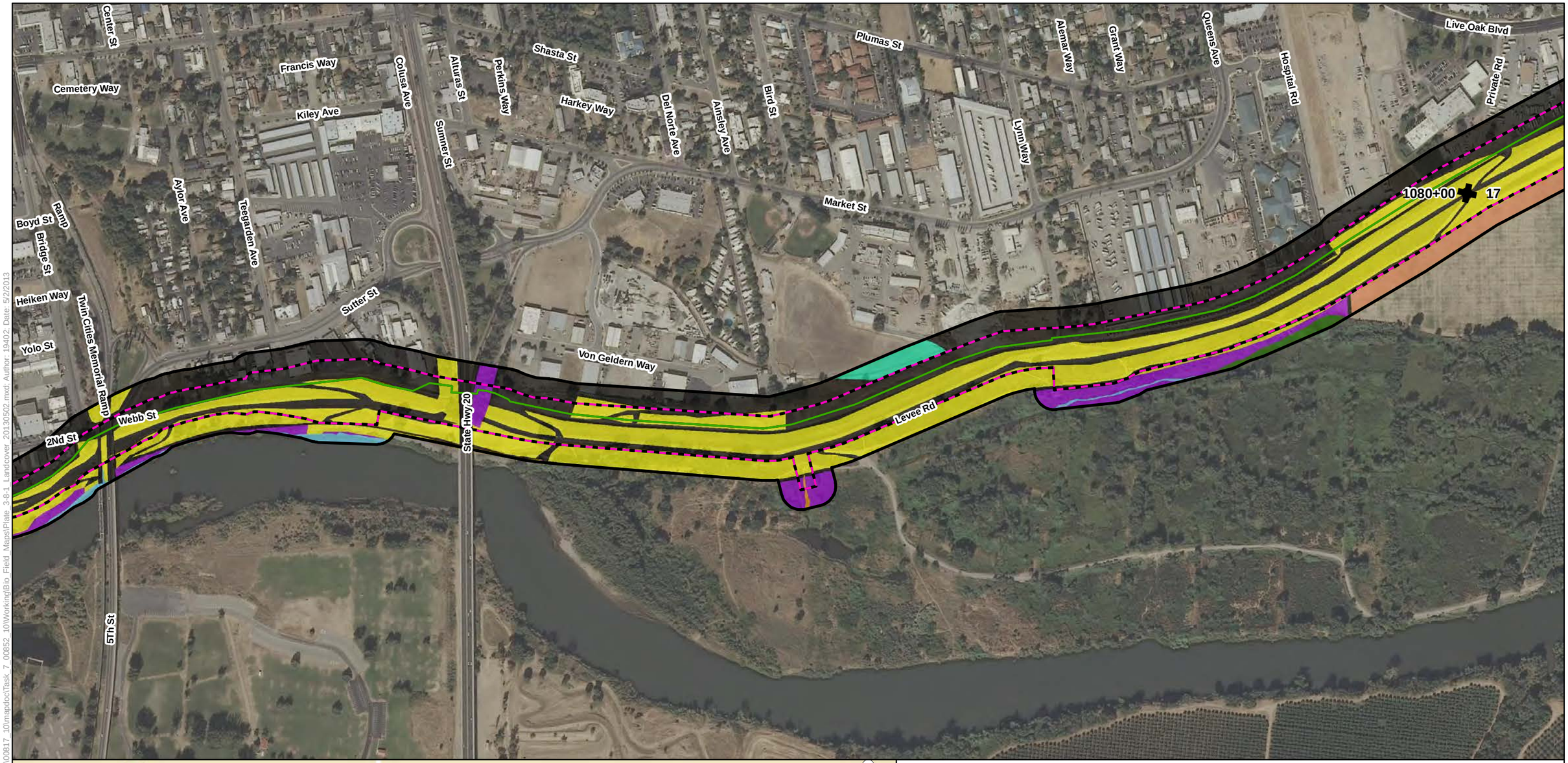

Legend

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- Orchard
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- Tailings Wetlands

Plate 3.8-1
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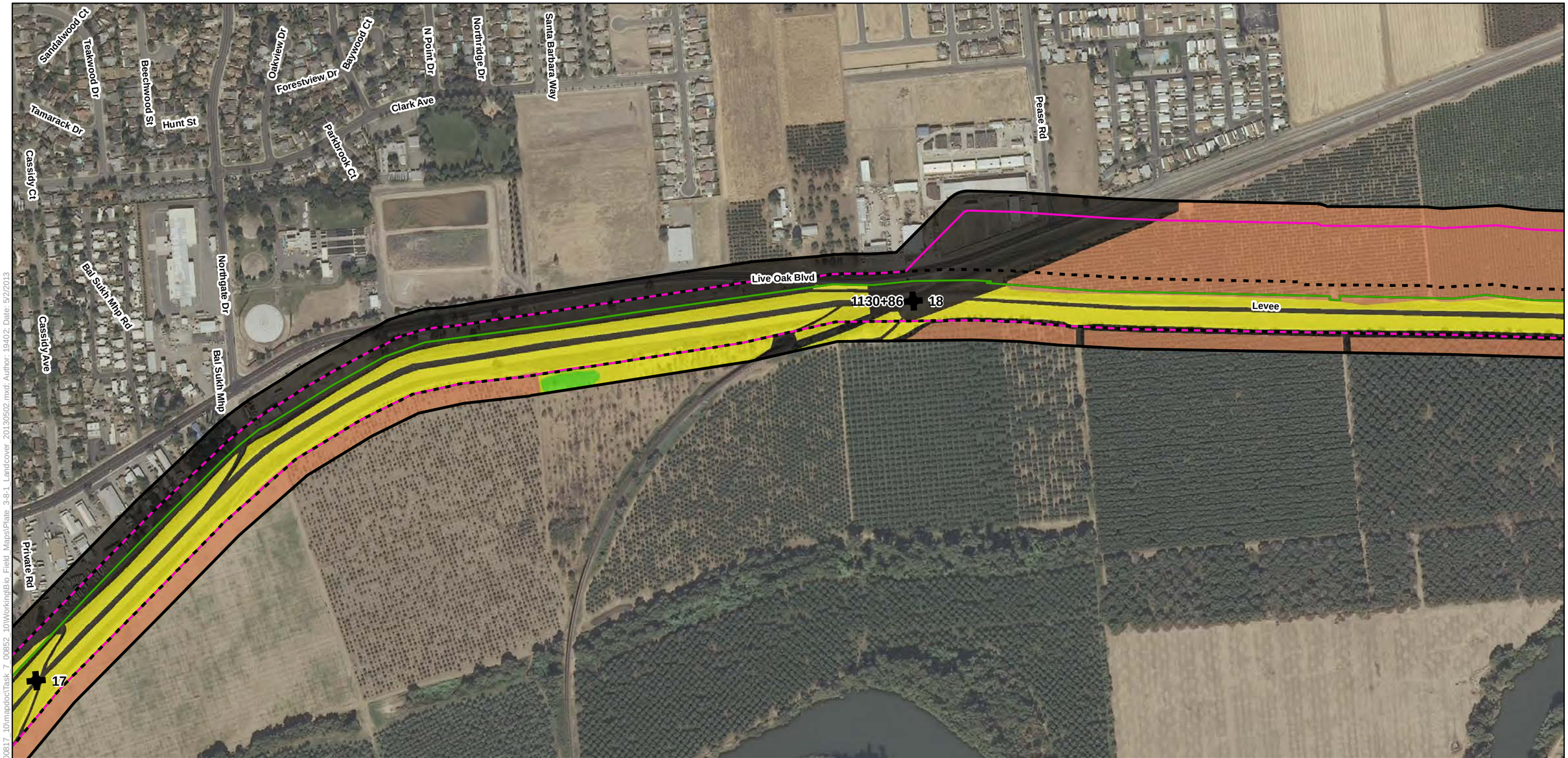

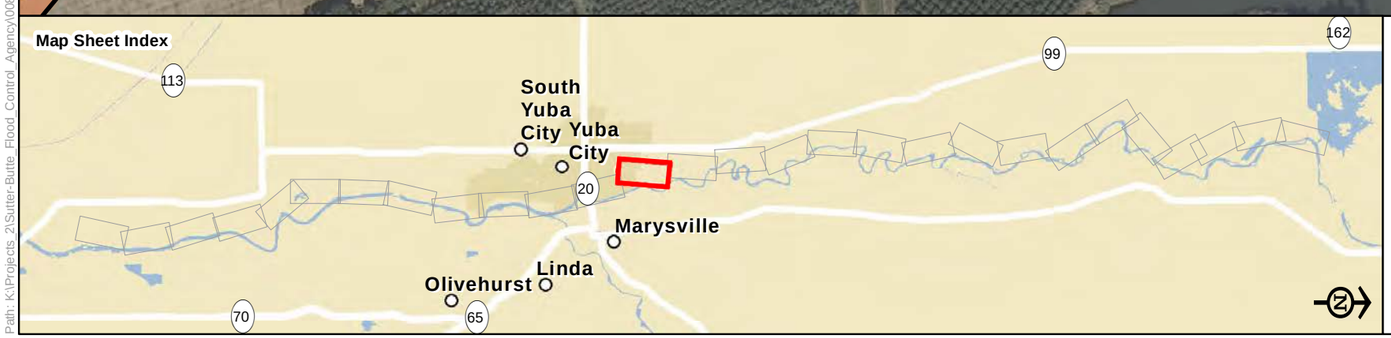

Legend

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Land Cover Types

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Sheet 13

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Live Oak Blvd

Rednall Rd

Levee Rd

Levee

1213+85

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South Yuba City

Yuba City

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Marysville

Linda

Olivehurst

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Land Cover Types in the Biological Study Area for Alternative 1-3

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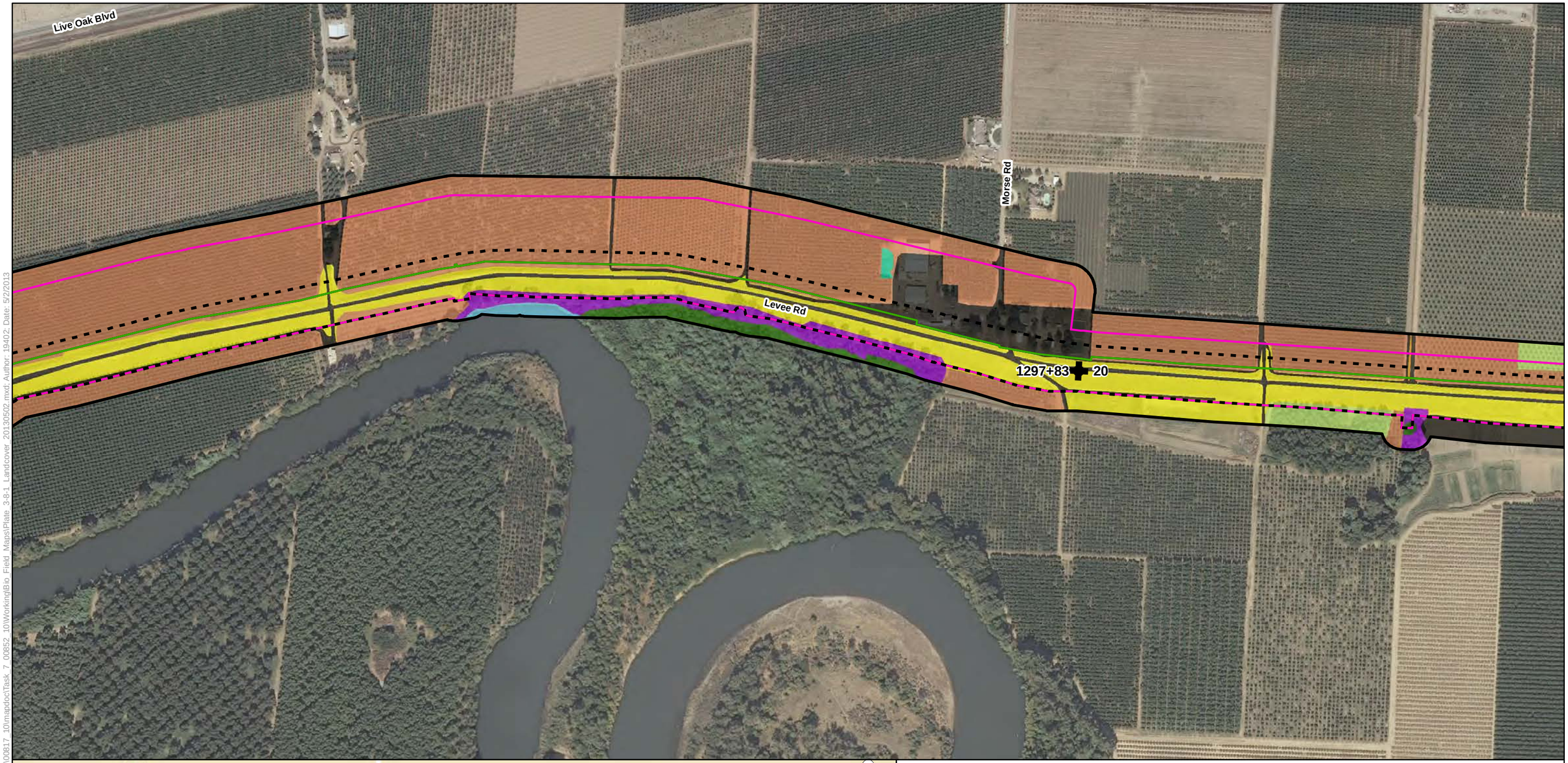

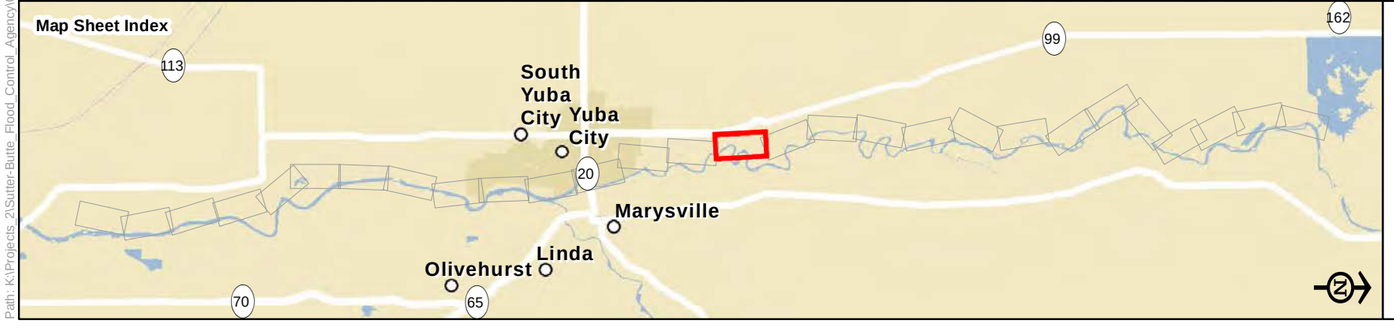

Legend

- Biological Study Area
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- Station 202+50

Land Cover Types

- Developed
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- Ruderal
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Land Cover Types in the Biological Study Area for Alternative 1-3

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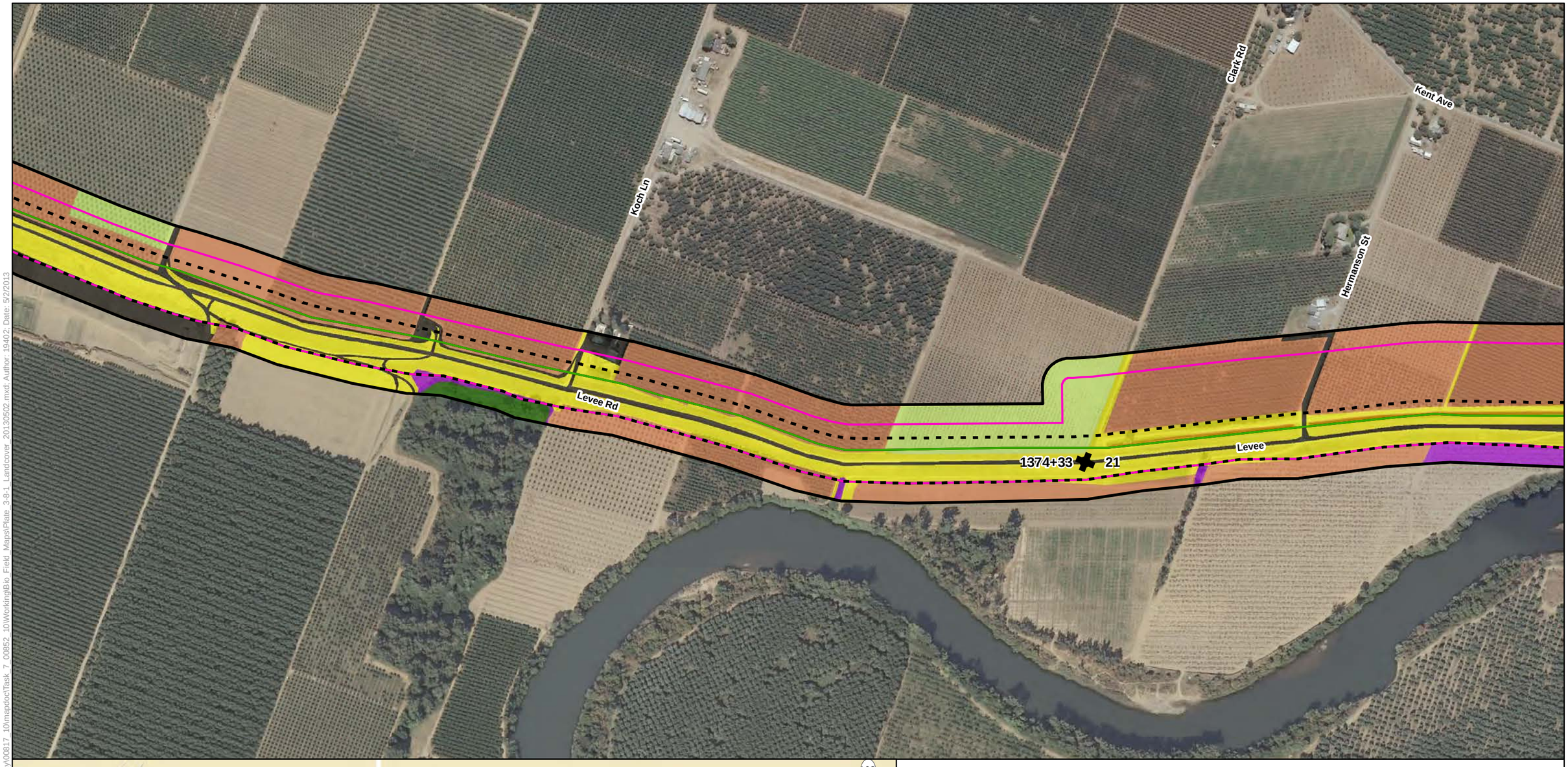

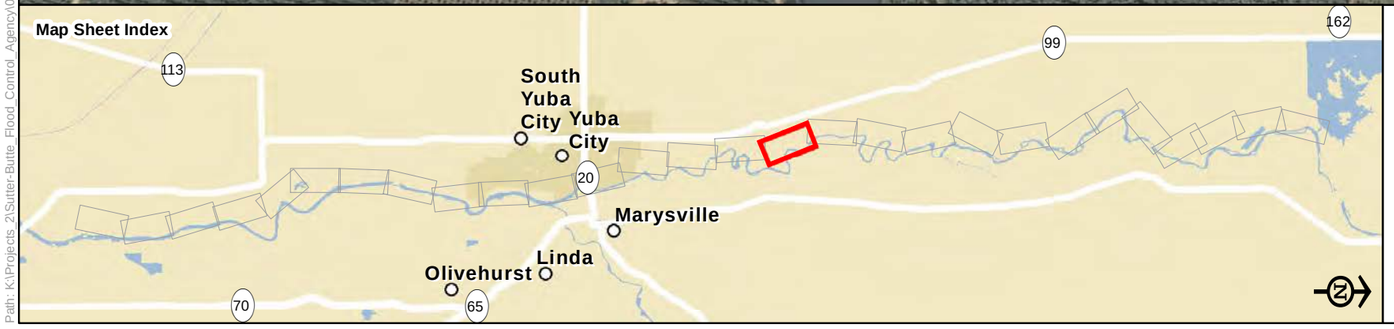

Legend

- Biological Study Area
- Alternative 1
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Land Cover Types

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Plate 3.8-1
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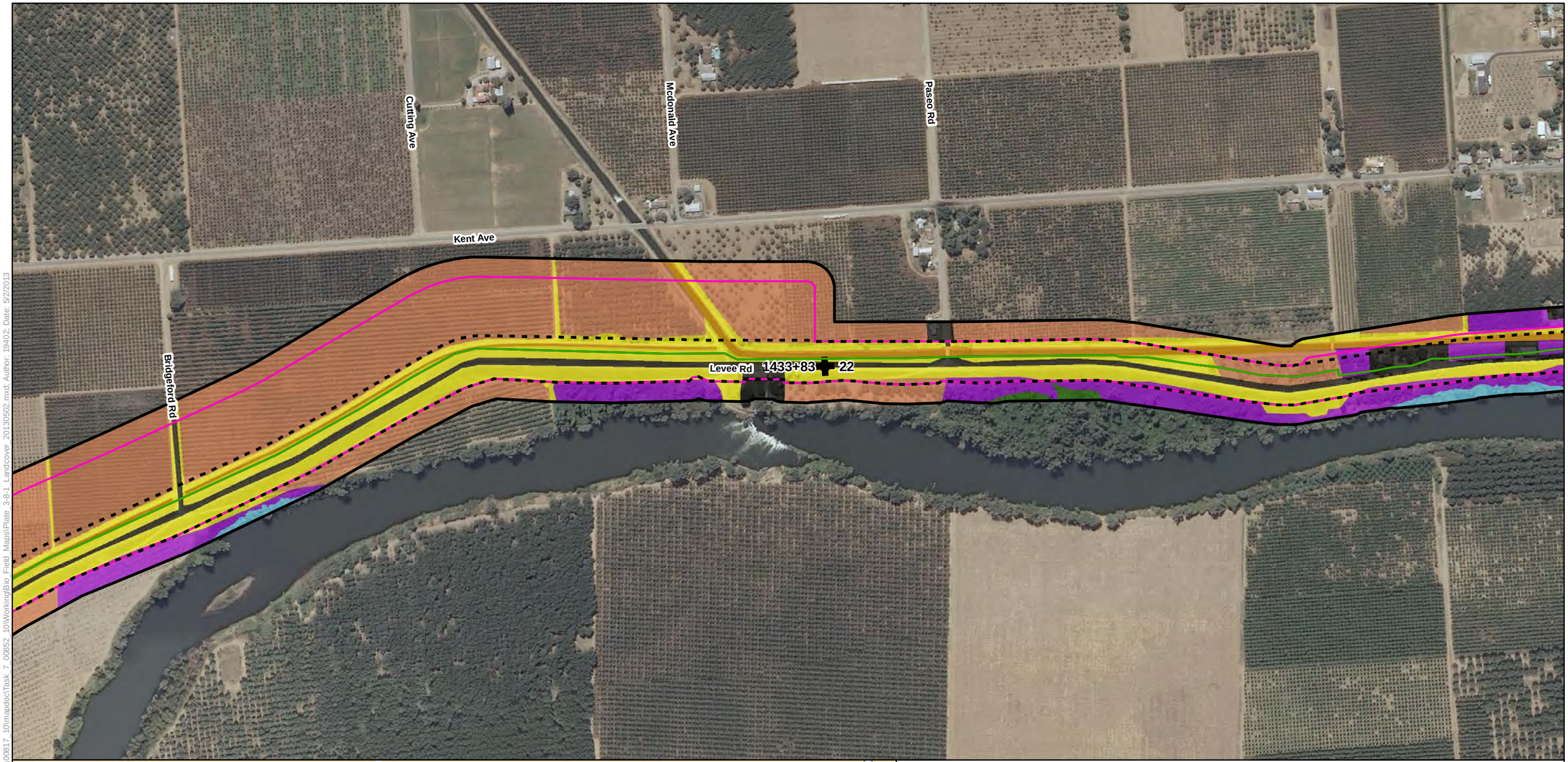

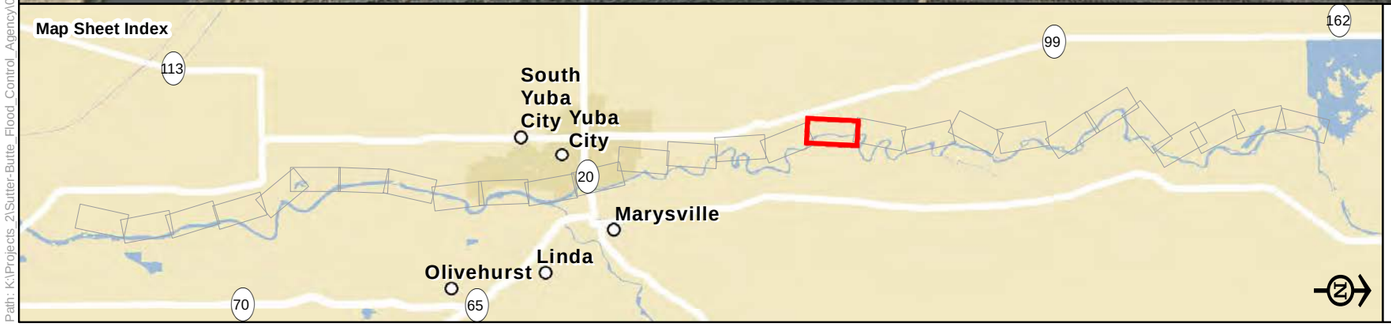

Legend

- Biological Study Area
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Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

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Bishop Ave
Kent Ave
Archer Ave
Pennington Rd
1503+83
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Private Rd
Levee Rd

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South Yuba City
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- Riparian Scrub-Shrub
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- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

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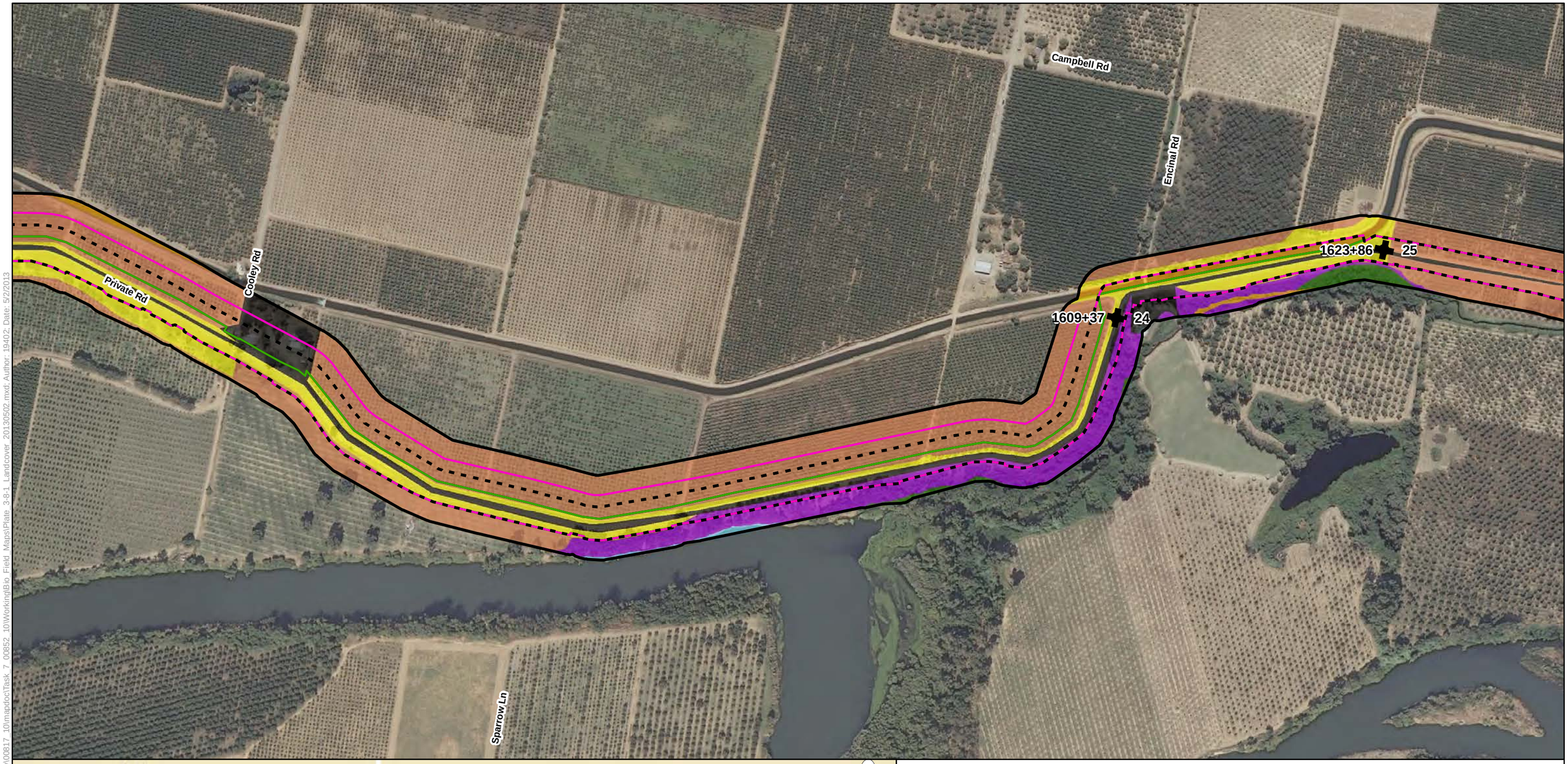

Legend

- Biological Study Area
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Land Cover Types

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Plate 3.8-1
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0 250 500
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Metteer Rd

Chandon Ave

Levee Rd

1674+37

26

1707+11

27

Private Rd

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South Yuba City

Yuba City

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Marysville

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- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

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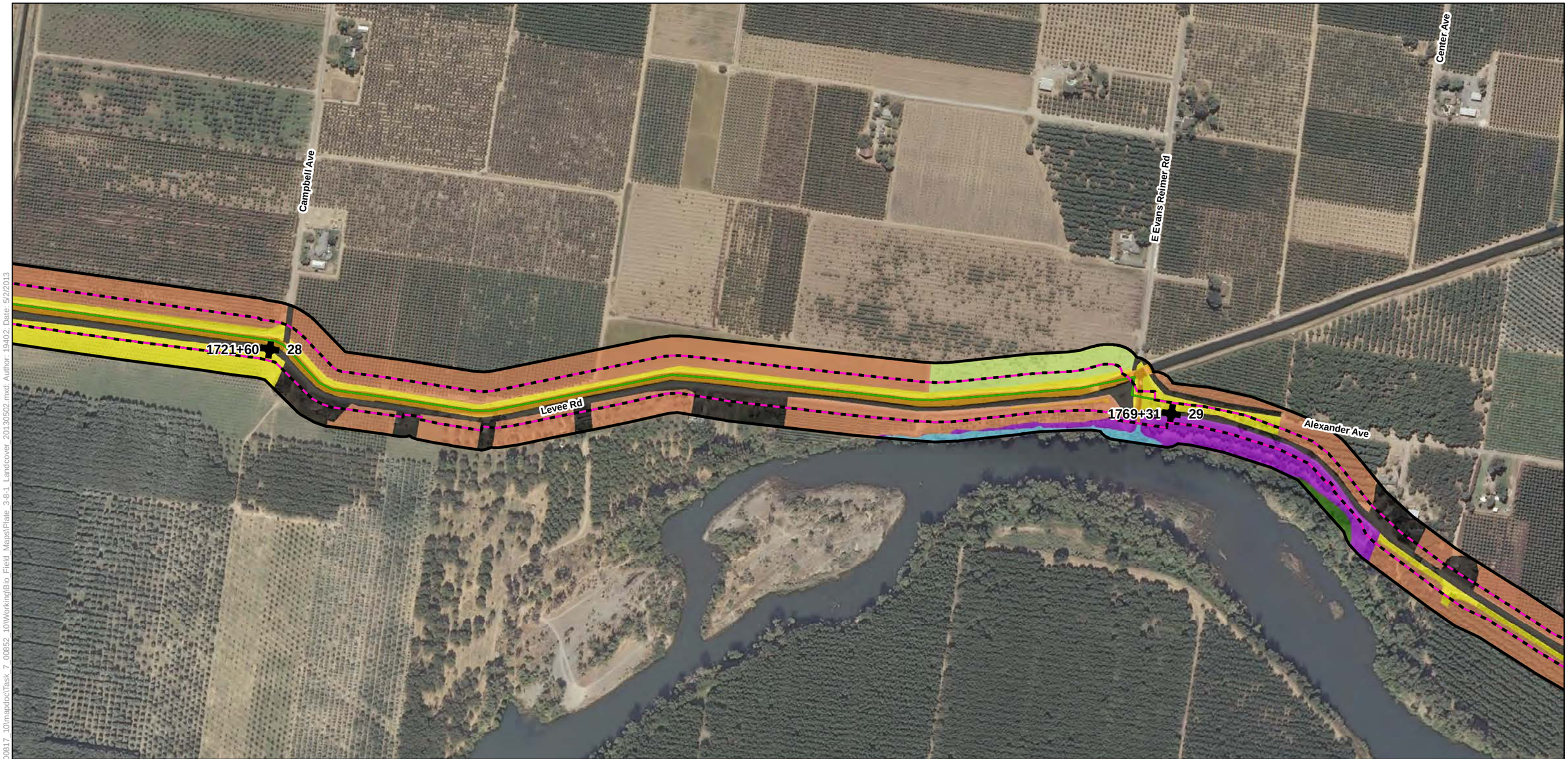

Legend

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Land Cover Types

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- Riparian Scrub-Shrub
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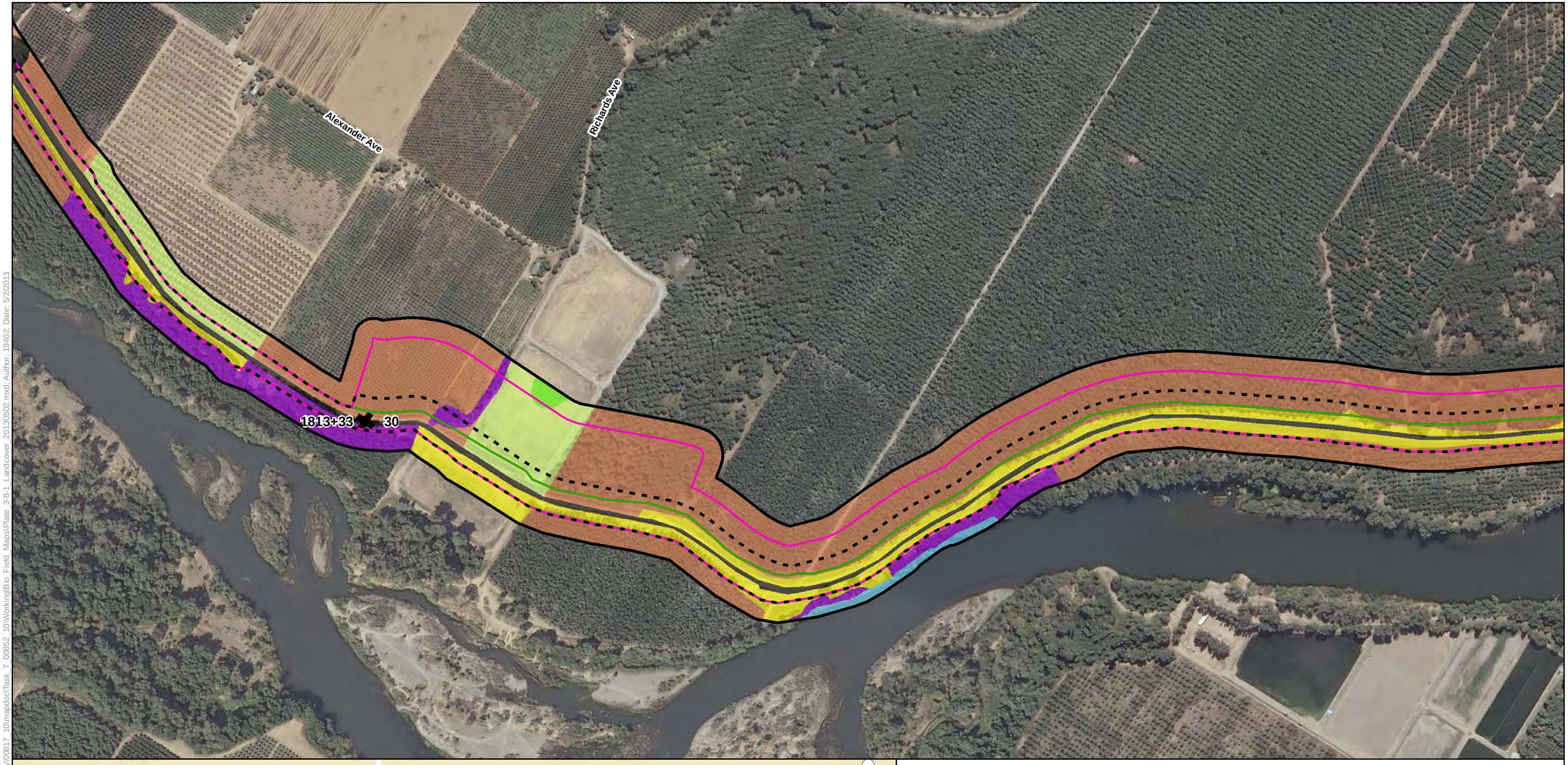

Legend

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Rutland Ct
Kirk Rd
Marie Ct
James Rowe Dr
Maitland Ct
Larkin Rd
Staff Dr
Ernest Ave
Ogden Ave
Mcconnell Ave
Sussex Ave
Authority Dr
Booth Dr
Briarcliff Ln
1902+00
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E Gridley Rd
Hutchins Dr

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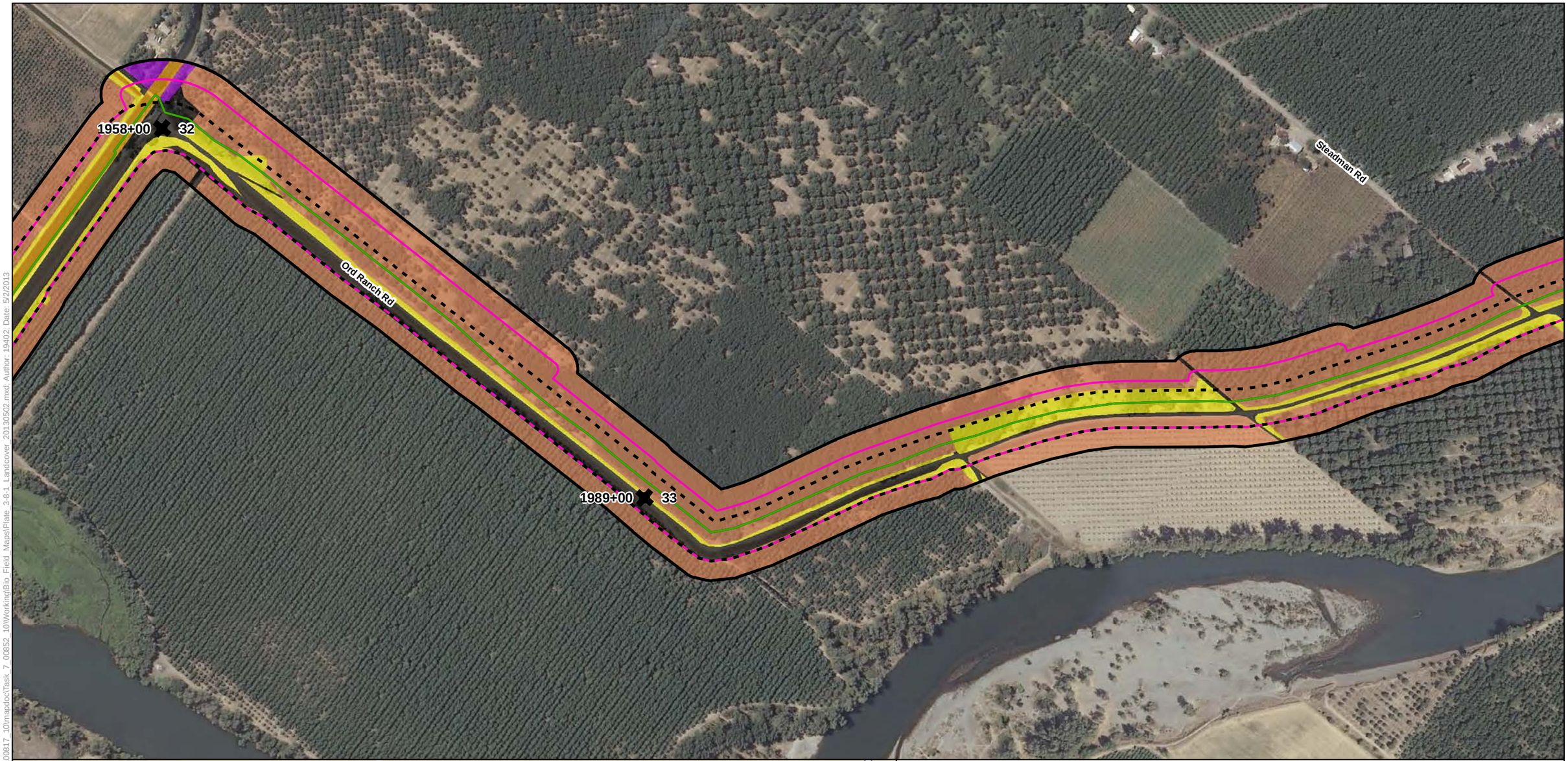

Legend

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- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 24

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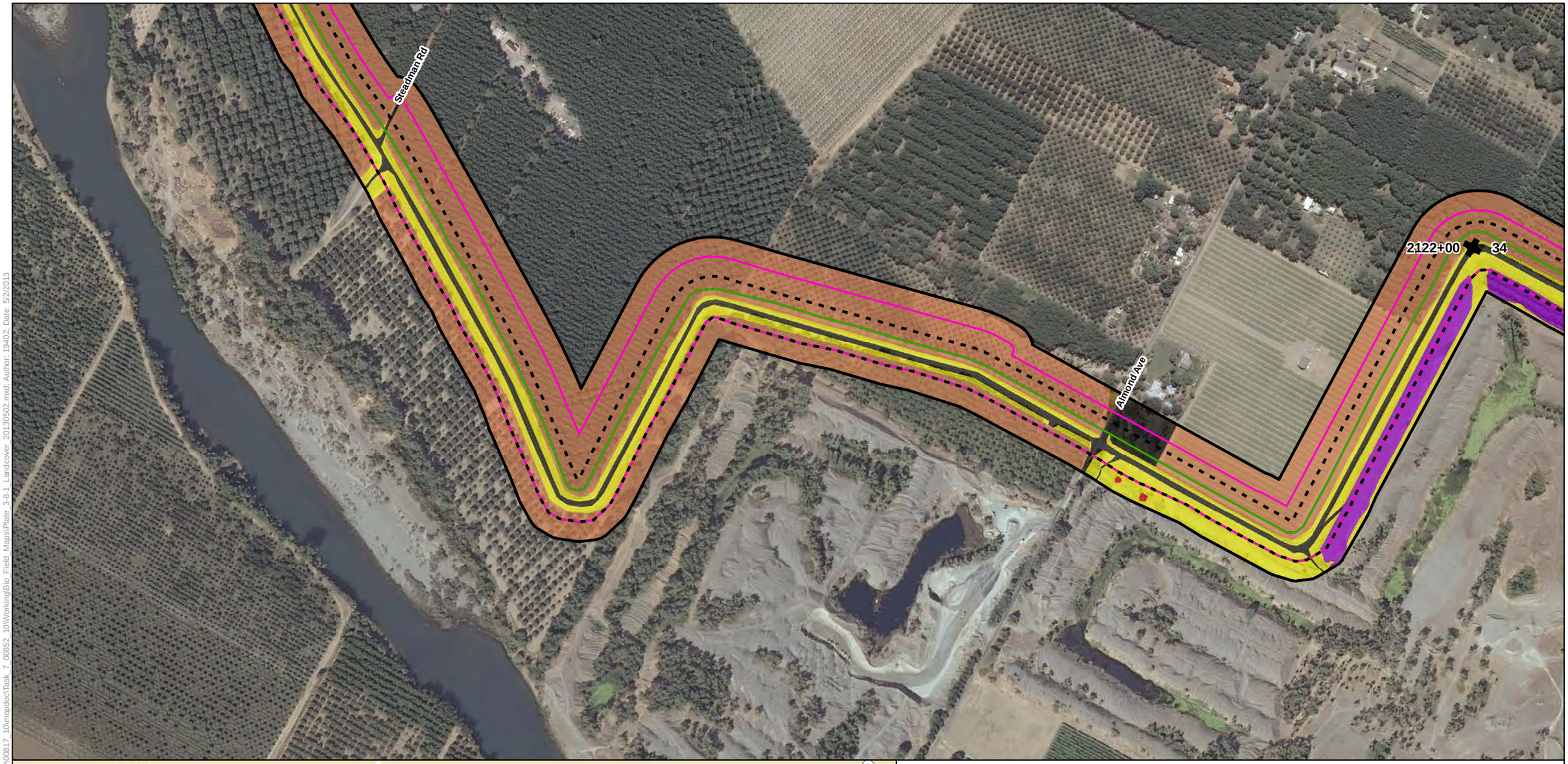


Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

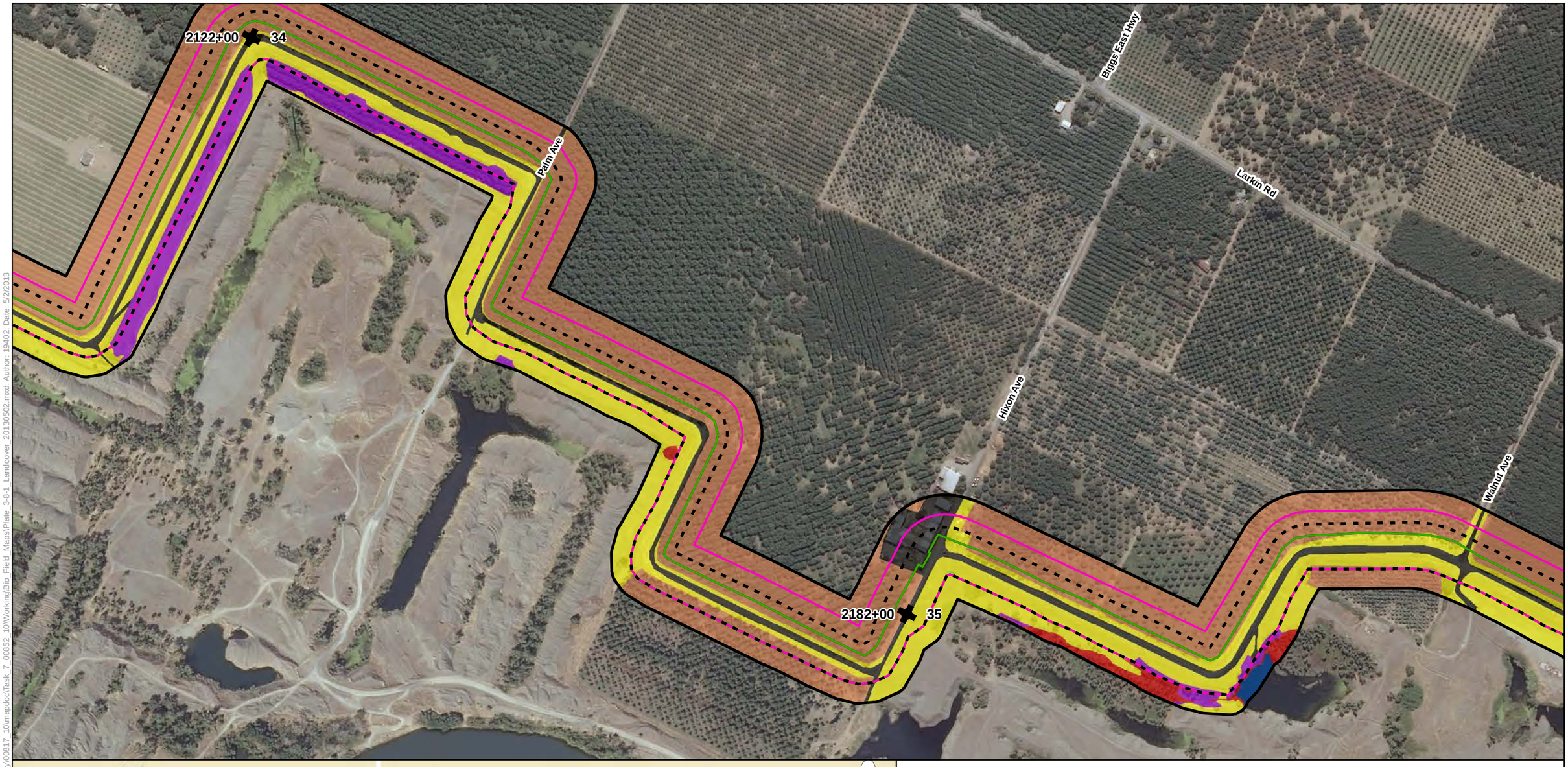
- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 25

0 250 500
Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Bio_Field_Maps\Plate_3-8-1_Landcover_20130502.mxd; Author: 19402; Date: 5/2/2013



Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 26

0 250 500
Feet

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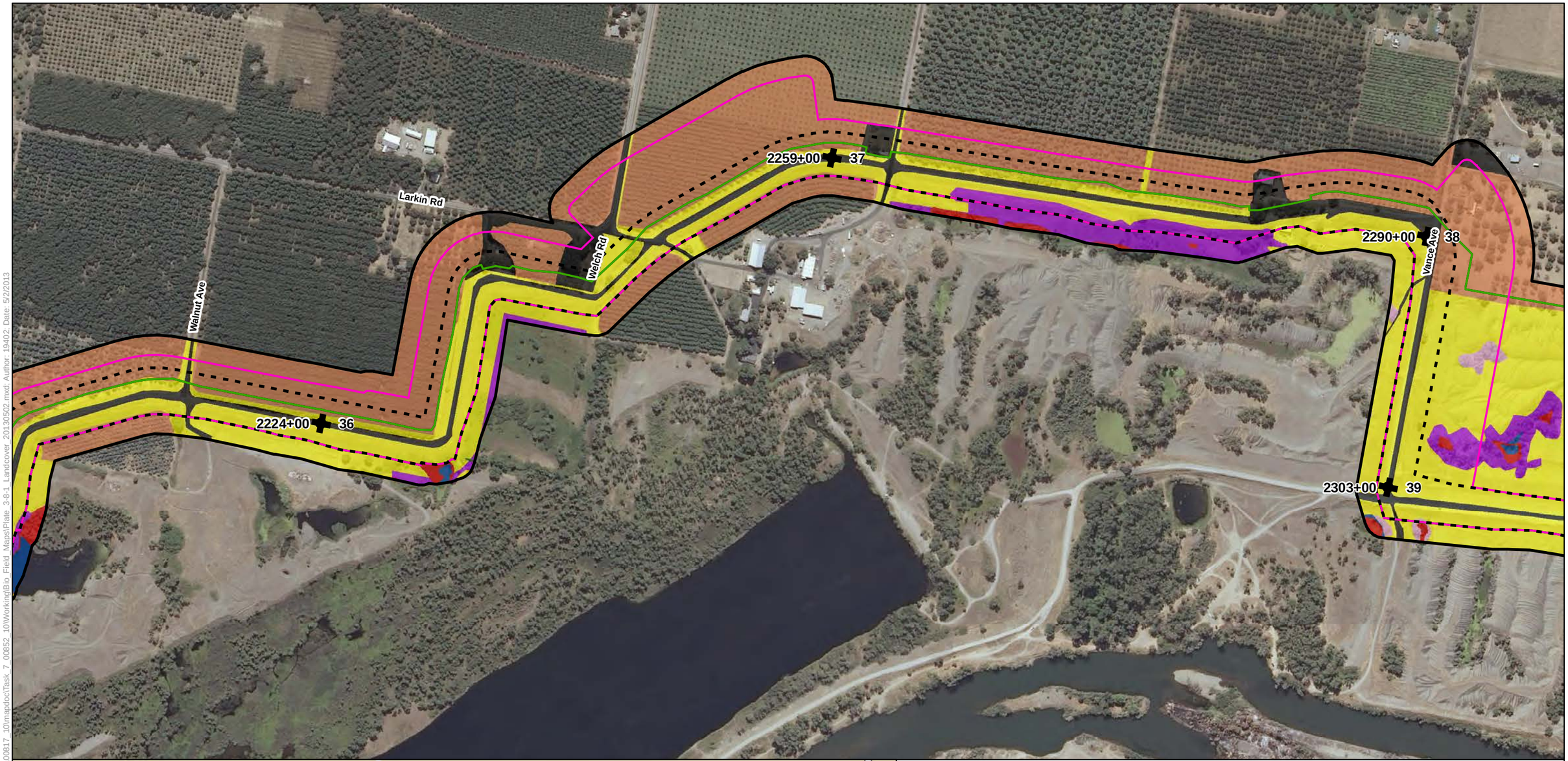

Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 27

0 250 500
Feet

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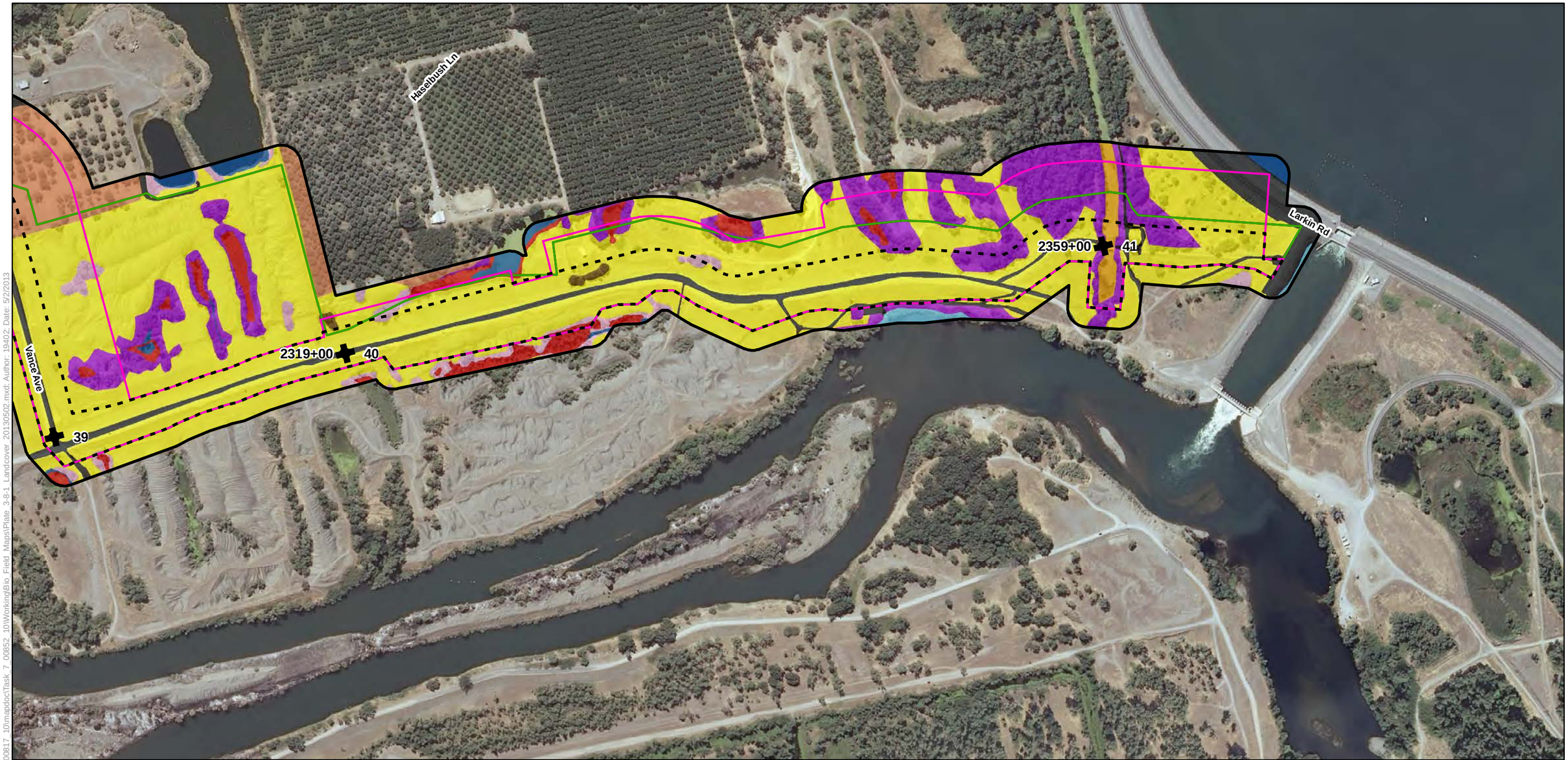

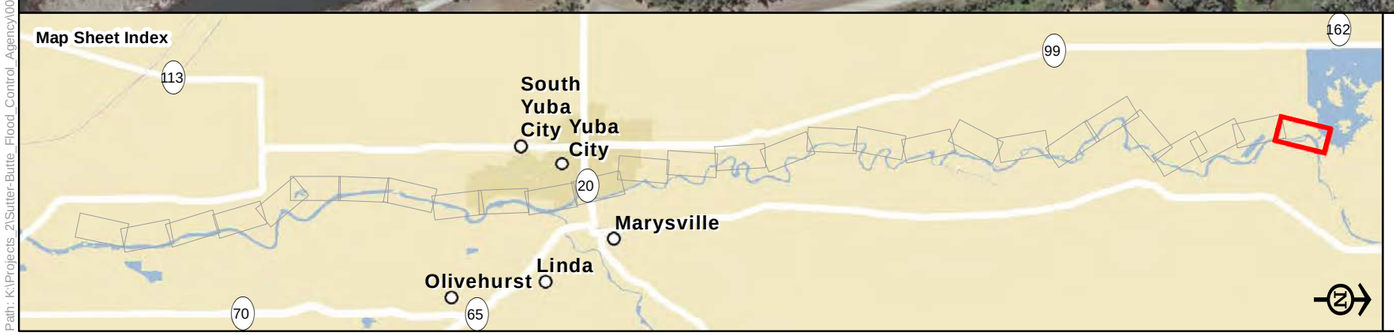

Legend

- Biological Study Area
- Alternative 1
- Alternative 2
- Alternative 3
- Reach
- Station 202+50

Land Cover Types

- Developed
- Ditch/Canal
- Field and Row Crops
- Forested/Shrub Wetland
- Oak Woodland
- Open Water
- Orchard
- Pond/Basin
- Riparian Forest
- Riparian Scrub-Shrub
- Ruderal
- Seasonal Wetlands
- Stream/River
- Tailings Wetlands

Plate 3.8-1
Land Cover Types in the Biological Study Area for Alternative 1-3

Sheet 28

0 250 500
Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Bio_Field_Maps\Plate_3-8-1_Landcover_20130502.mxd; Author: 19402; Date: 5/2/2013

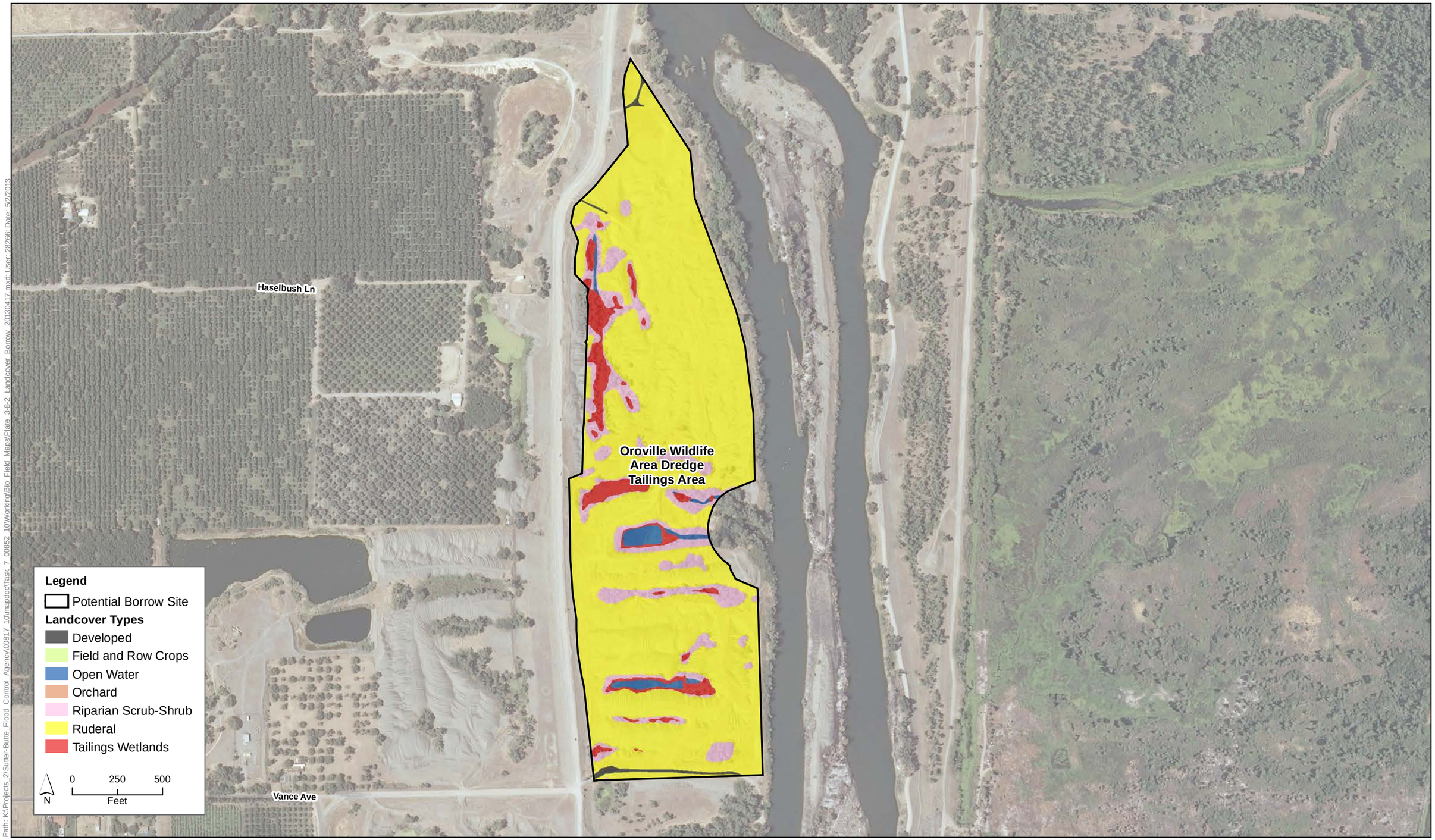

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Figure 3.8-2
Landcover Types at the Potential Borrow Sites

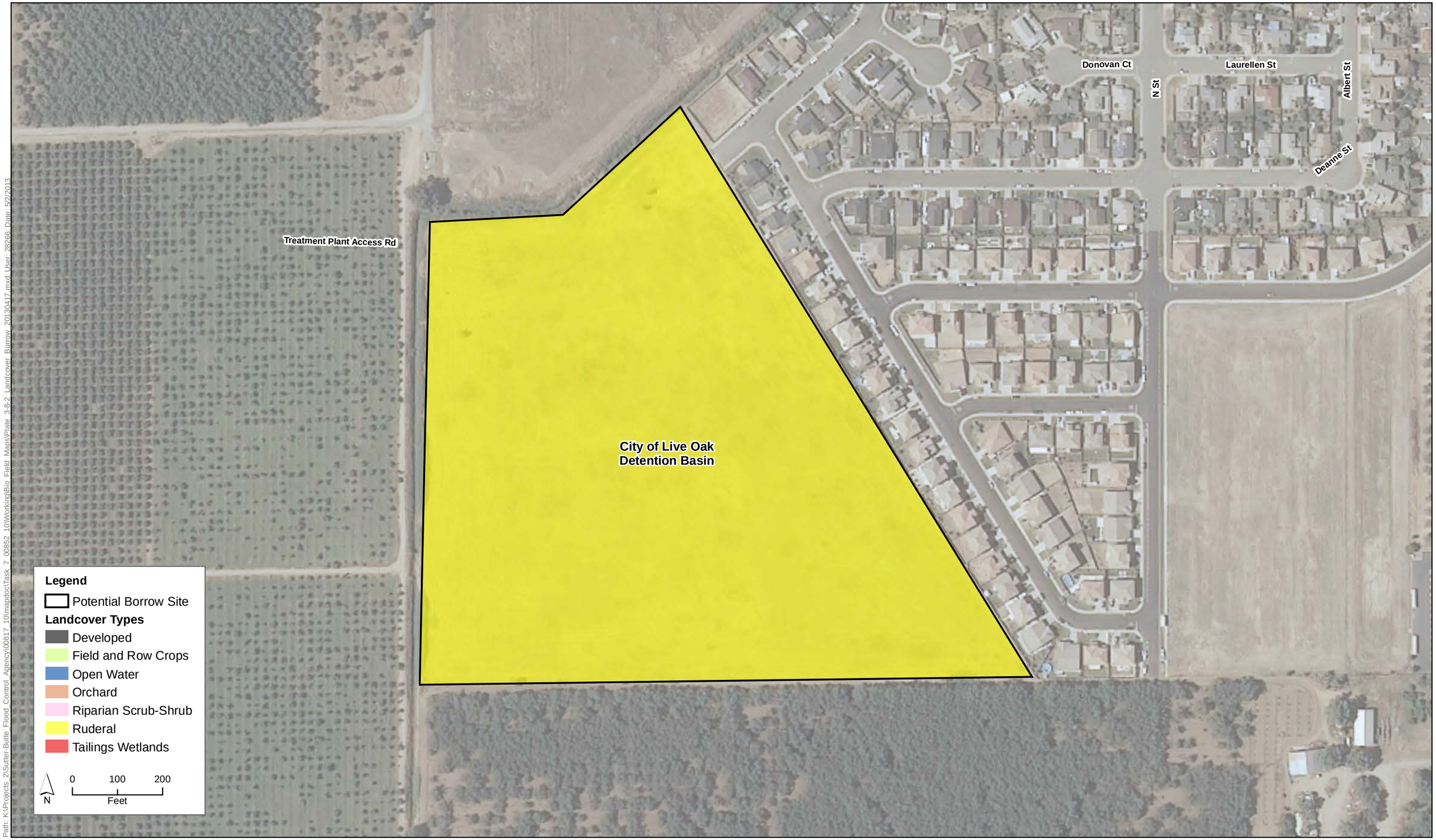

Figure 3.8-2
Landcover Types at the Potential Borrow Sites

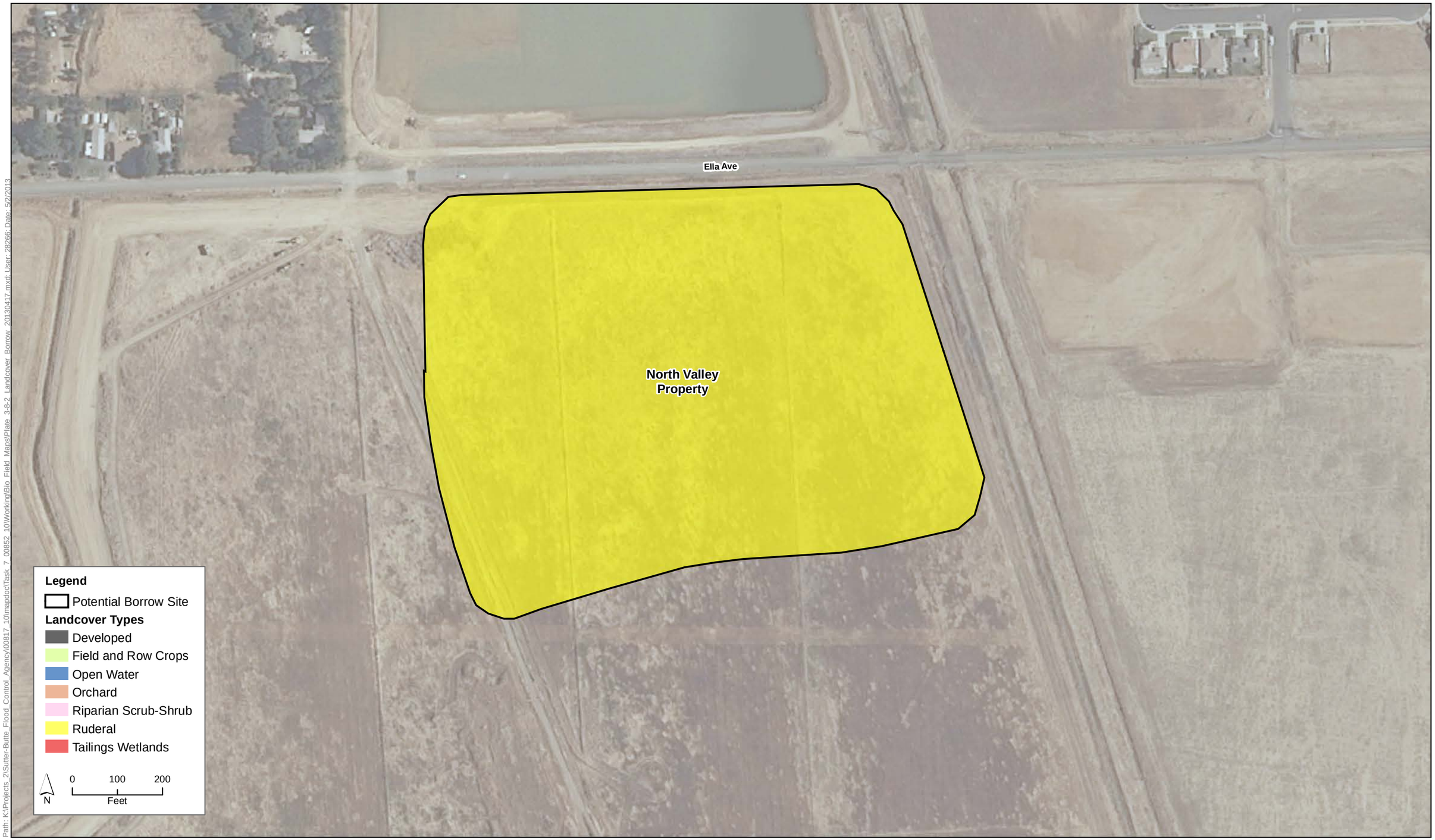

Figure 3.8-2
Landcover Types at the Potential Borrow Sites

Figure 3.8-2
Landcover Types at the Potential Borrow Sites

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Figure 3.8-2
Landcover Types at the Potential Borrow Sites

Bellevue Ave

Laurel Ave

Oak Ave

Cypress Ave

202+50

218+66

3

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Legend

Biological Study Area

Potential Borrow Site

Reach

Station 202+50

Elderberry Shrub

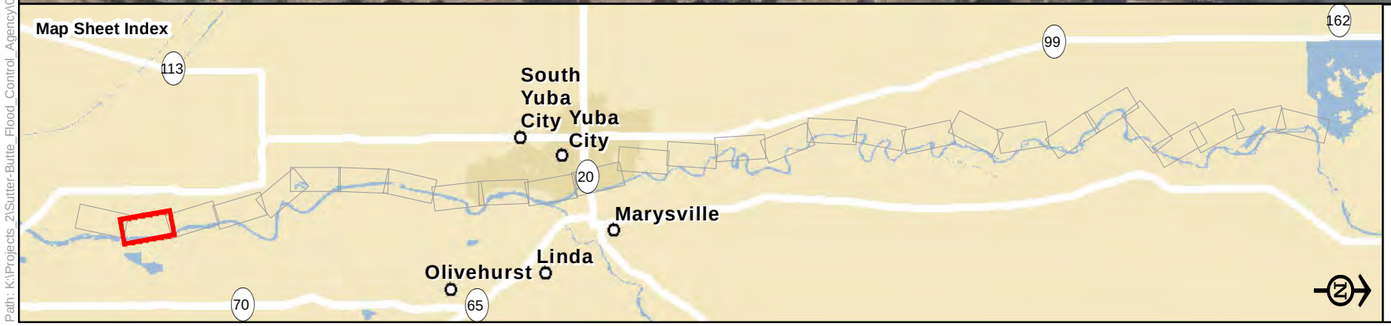
Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 1

0 250 500

Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Elderberry\Fig_3_9_1_Elderberry_20130315.mxd: Author: 19402: Date: 3/18/2013



Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

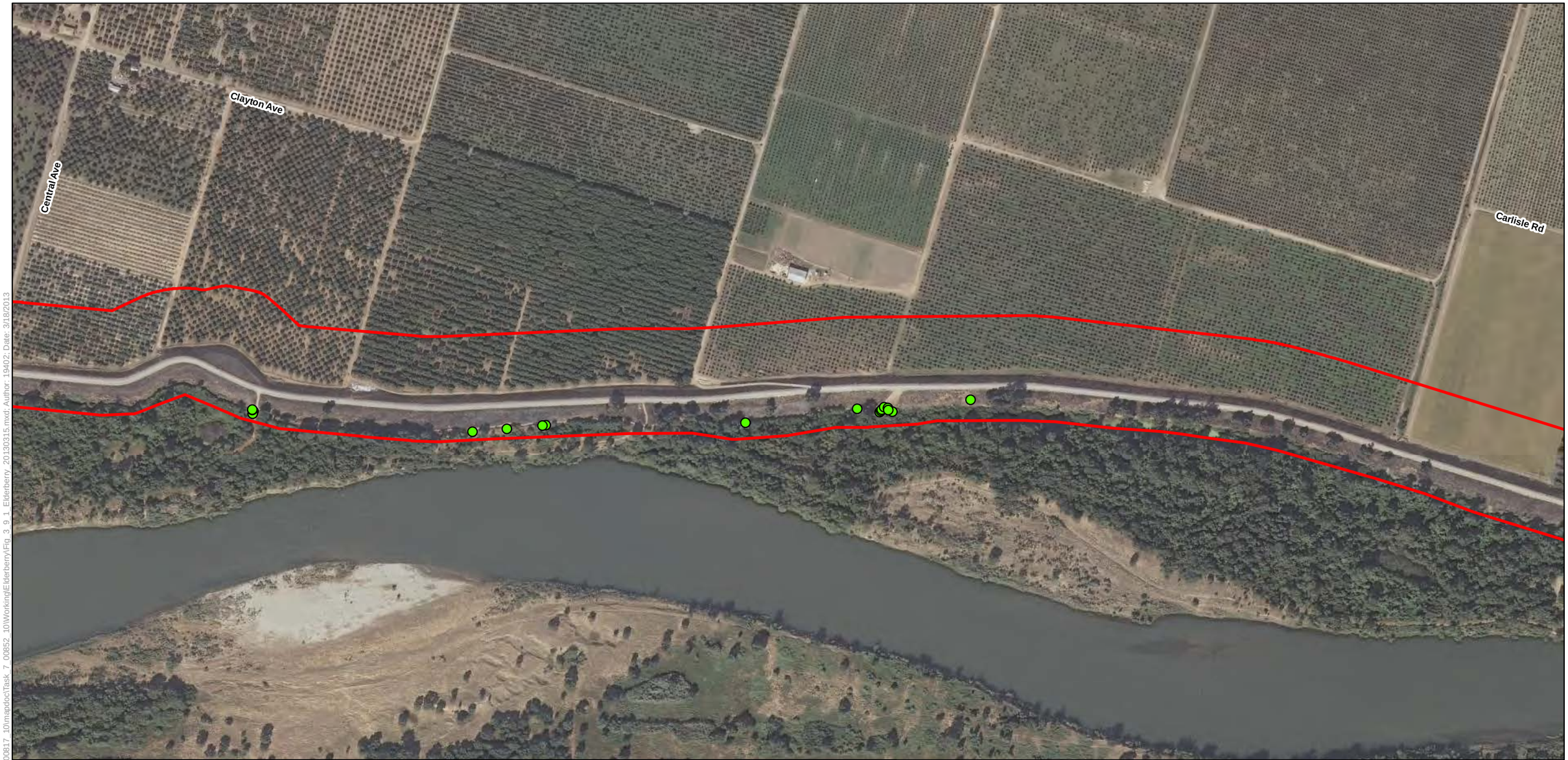
Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

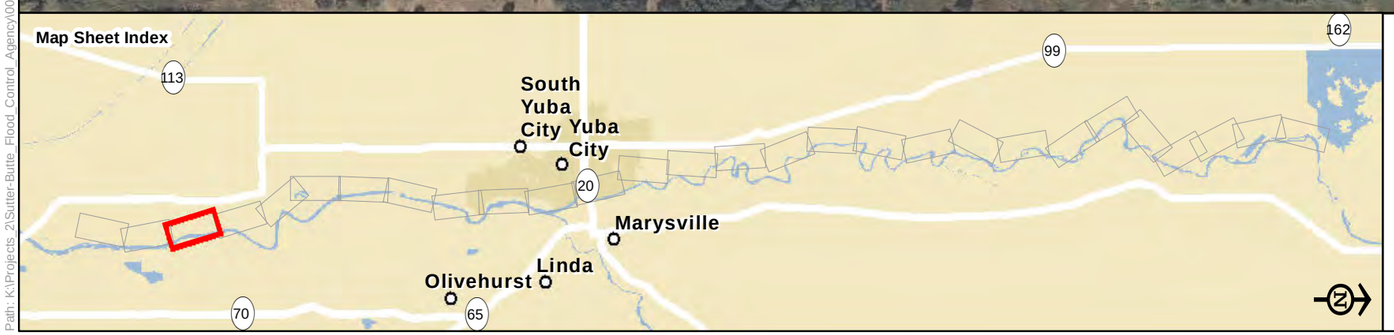
Sheet 2

0 250 500

Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Elderberry\Fig_3_9_1_Elderberry_20130315.mxd; Author: 19402; Date: 3/18/2013





Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 3

0 250 500

Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Elderberry\Fig_3_9_1_Elderberry_20130315.mxd: Author: 19402: Date: 3/18/2013

Carlisle Rd
Wilkie Ave
Lyon Ave
Oconnor Ave
Peck Ave
Ashford Ave
410+67
5
478+68
6

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Legend
Biological Study Area
Potential Borrow Site
Reach
Station 202+50
Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 4

0 250 500
Feet

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Ashford Ave

Shannon Rd

Star Bend Rd

Garden Hwy

6

510+37

7

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- Biological Study Area
- Potential Borrow Site
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- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 5

0 250 500

Feet

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Garden Hwy

Obanion Rd

596+00

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- Biological Study Area
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- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 6

0 250 500

Feet

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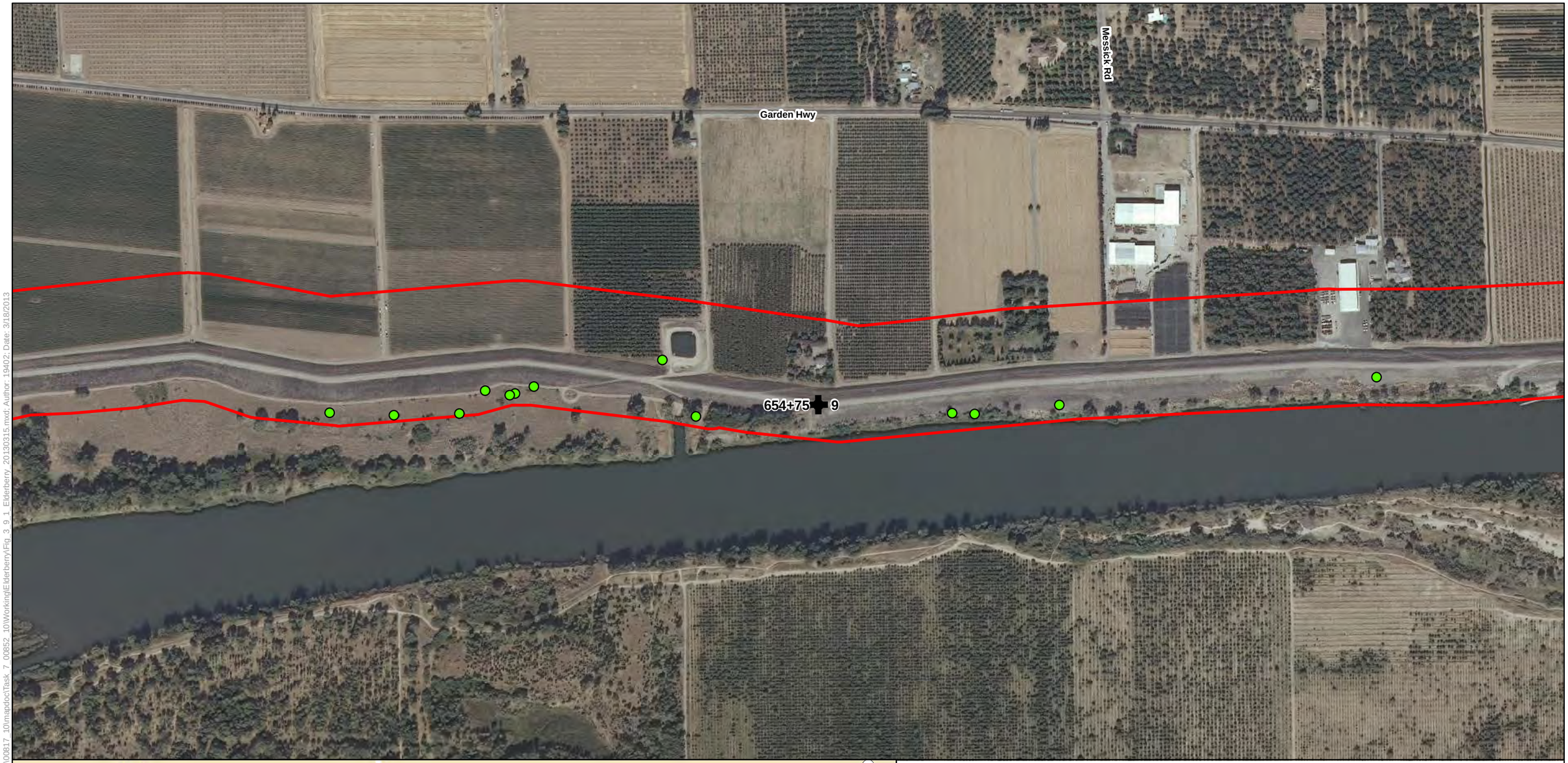

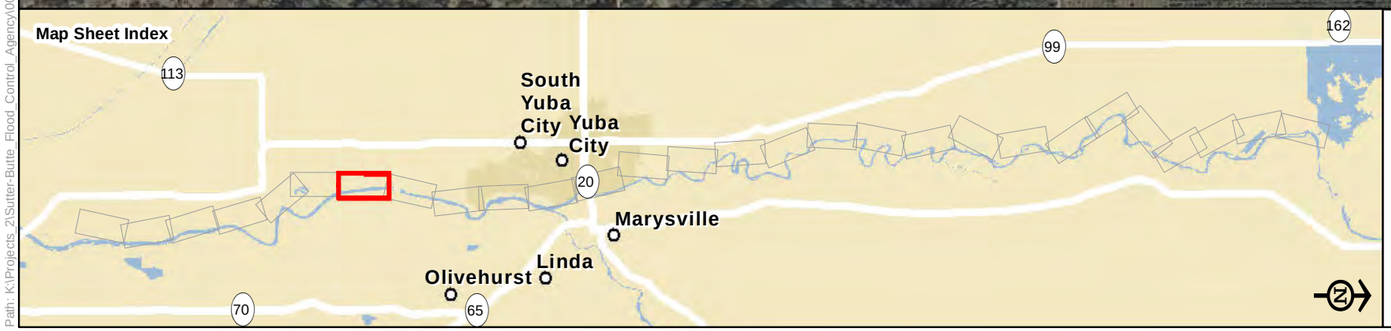

Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 7

0 250 500
Feet

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Oswald Rd

Garden Hwy

706+50 10

Levee Rd

Barry Rd

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Legend

- Biological Study Area
- Potential Borrow Site
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- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 8

0 250 500

Feet

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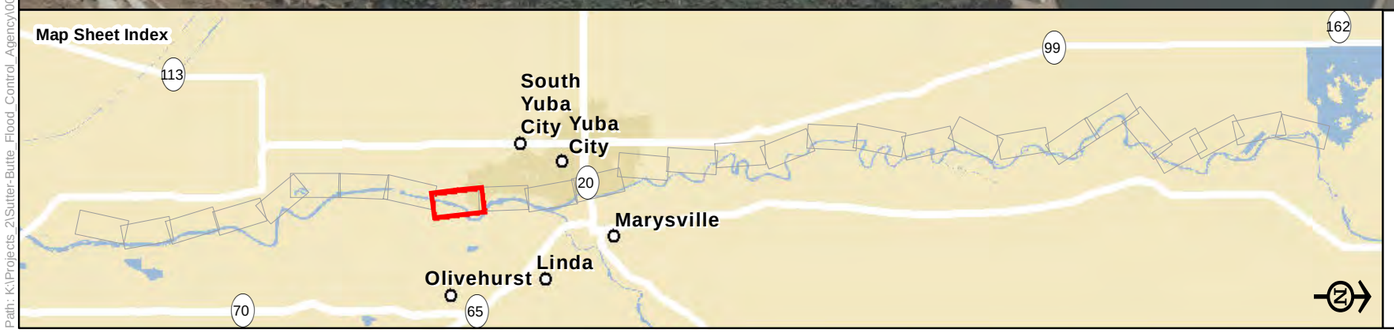

Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 9

0 250 500

Feet

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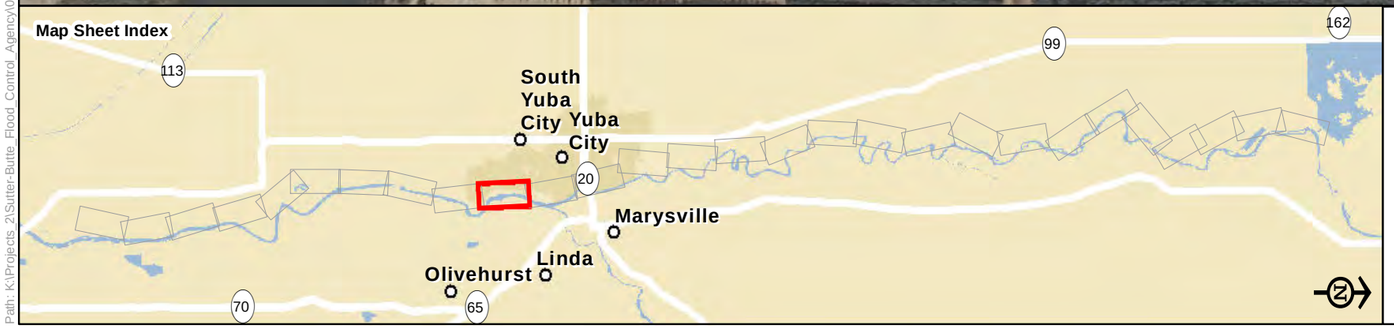

Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 10

0 250 500

Feet

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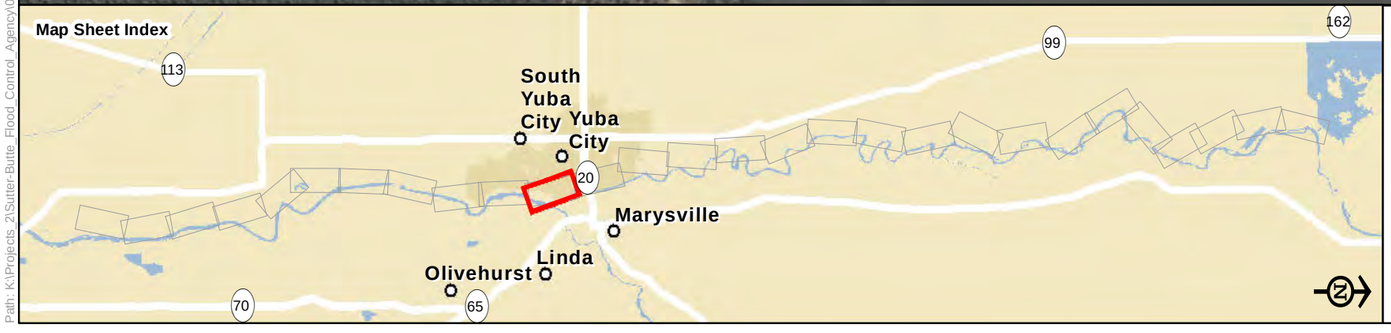

Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 11

0 250 500
Feet

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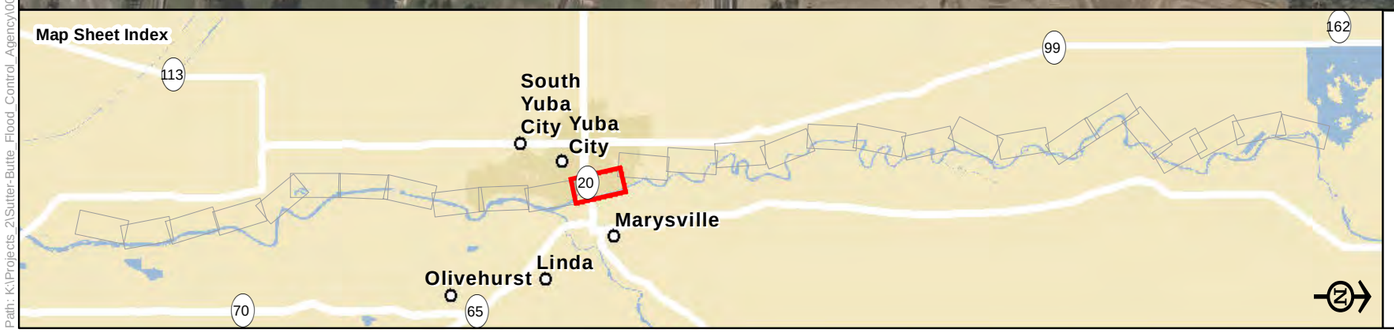
Center St
Francis Way
Cemetery Way
Kiley Ave
Colusa Ave
Alturas St
Perkins Way
Shasta St
Harkey Way
Del Norte Ave
Ainsley Ave
Bird St
Plumas St
Alemar Way
Grant Way
Queens Ave
Hospital Rd
Live Oak Blvd
Private Rd
Lynn Way
Sumner St
Market St
1080+00
17
Boyd St
Ramp
Bridge St
Aylor Ave
Teegarden Ave
Heiken Way
Twin Cities Memorial Ramp
Sutter St
Yolo St
Von Geldern Way
Webb St
2Nd St
State Hwy 20
Levee Rd
5th St



Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 12

0 250 500
Feet

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Sandalwood Ct
Teakwood Dr
Beechwood St
Oakview Dr
Forestview Dr
Baywood Ct
N Point Dr
Northridge Dr
Santa Barbara Way
Pease Rd
Tamarack Dr
Hunt St
Clark Ave
Parkbrook Ct
Cassidy Ct
Bal Sukh Mhp Rd
Northgate Dr
Live Oak Blvd
1130+86
18
Levee
Cassidy Ave
Bal Sukh Mhp
Private Rd
17

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Legend

- Biological Study Area
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- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 13

0 250 500
Feet

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Live Oak Blvd

Rednall Rd

Levee

Levee Rd

1213+85 19

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Legend

- Biological Study Area
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- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 14

0 250 500

Feet

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Live Oak Blvd

Levee Rd

Morse Rd

1297+83 ✚ 20

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Legend

- Biological Study Area
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- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 15

0 250 500

Feet

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Clark Rd
Kent Ave
Koch Ln
Hermanson St
Levee Rd
Levee
1374+33
21

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Legend

- Biological Study Area
- Potential Borrow Site
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Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 16

0 250 500
Feet

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Cutting Ave

Mcdonald Ave

Paseo Rd

Kent Ave

Bridgeford Rd

Levee Rd

1433+83 22

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Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 17

0 250 500
Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Elderberry\Fig_3_9_1_Elderberry_20130315.mxd; Author: 19402; Date: 3/18/2013

Bishop Ave
Kent Ave
Archer Ave
Pennington Rd
1503+83
23
Private Rd
Levee Rd

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Biological Study Area
Potential Borrow Site
Reach
Station 202+50
Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area
Sheet 18

0 250 500
Feet

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Campbell Rd

Encinal Rd

Private Rd

Cooley Rd

1623+86

25

1609+37

24

Sparrow Ln

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Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 19

0 250 500

Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdoc\Task_7_00852_10\Working\Elderberry\Fig_3_9_1_Elderberry_20130315.mxd: Author: 19402: Date: 3/18/2013

Metteer Rd

Chandon Ave

Levee Rd

Private Rd

1674+37

26

1707+11

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Legend

- Biological Study Area
- Potential Borrow Site
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- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 20

0 250 500

Feet

Path: K:\Projects_2\Sutter-Butte_Flood_Control_Agency\00817_10\mapdocs\Task_7_00852_10\Working\Elderberry\Fig_3_9_1_Elderberry_20130315.mxd; Author: 19402; Date: 3/18/2013

Campbell Ave

E Evans Reimer Rd

Center Ave

1721+60 28

Levee Rd

1769+31 29

Alexander Ave

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South Yuba City

Yuba City

20

Marysville

Linda

Olivehurst

70

65

99

162

Legend

- Biological Study Area
- Potential Borrow Site
- Reach
- Station 202+50
- Elderberry Shrub

Plate 3.9-1
Approximate Locations of Elderberry Shrubs in the Study Area

Sheet 21

0 250 500

Feet

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Alexander Ave

Richards Ave

18+13+33

30

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South Yuba City

Yuba City

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Marysville

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Sheet 22

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Rutland Ct
Kirk Rd
Marie Ct
James Rowe Dr
Maitland Ct
Larkin Rd
Staff Dr
Ernest Ave
Ogden Ave
Mcconnell Ave
Booth Dr
Sussex Ave
Authority Dr
Briarcliff Ln
1902+00
31
E Gridley Rd
Hutchins Dr

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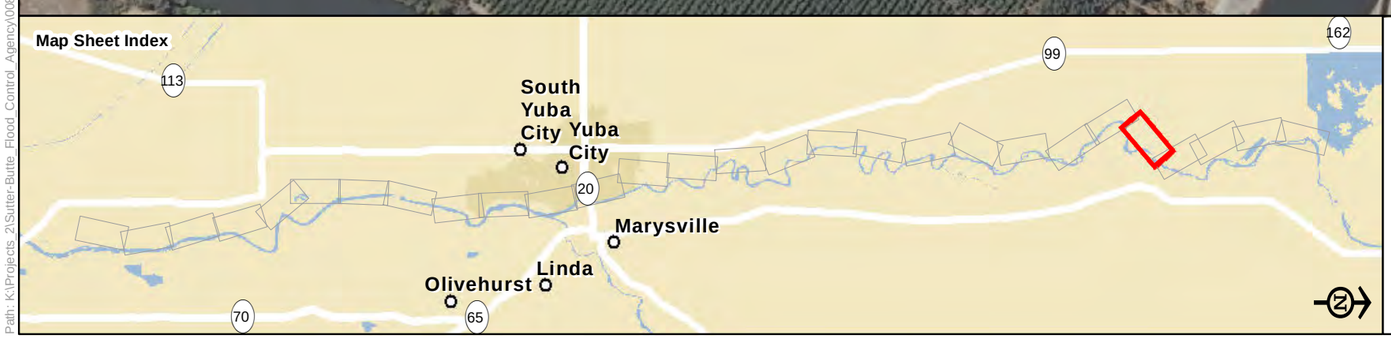

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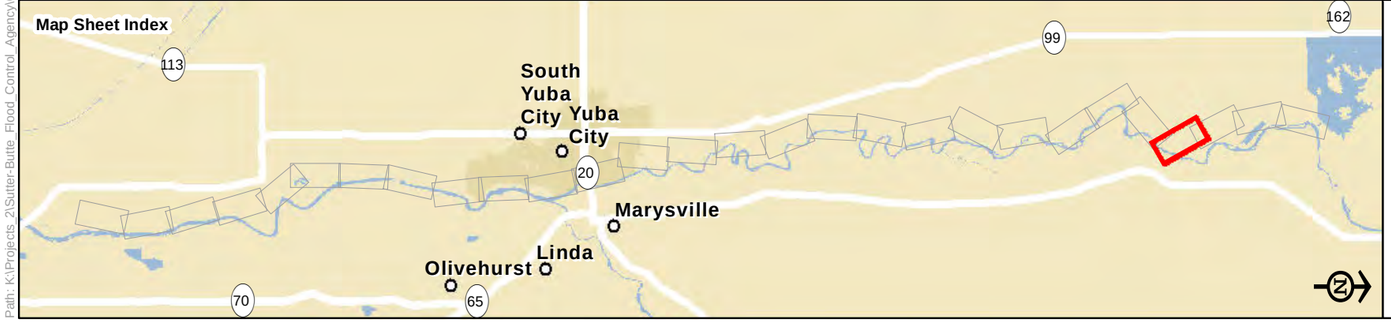

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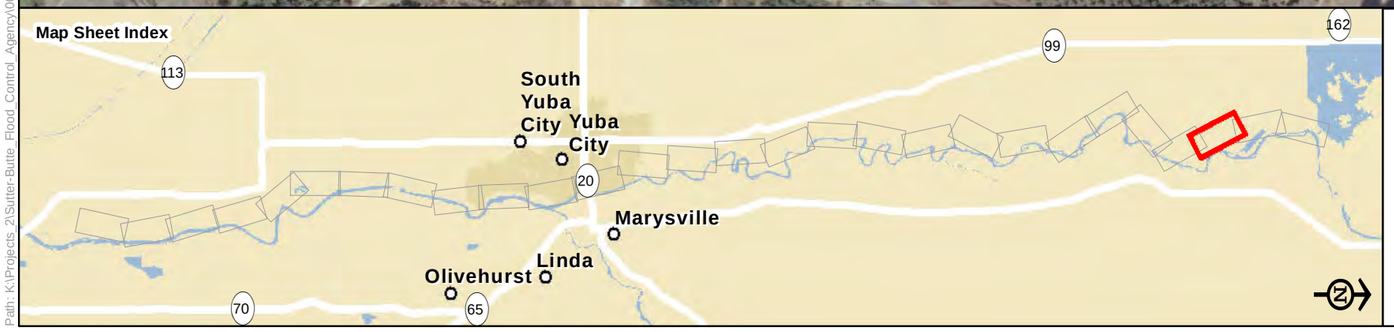

Legend

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Sheet 26

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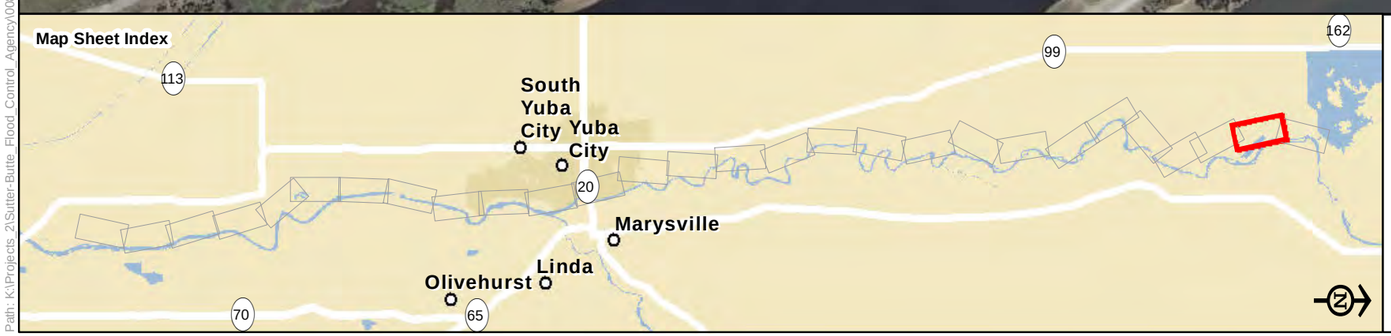

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Sheet 27

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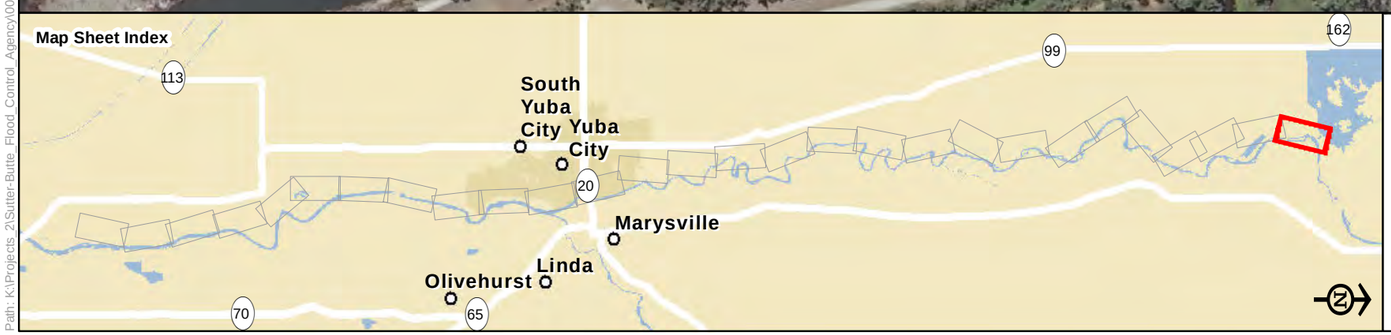

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Feet

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Legend

Sutter Basin Study Area

Alternatives

Important Farmland Categories

Prime Farmland

Farmland of Statewide Importance

Unique Farmland

Grazing Land

Water

Urban and Built-up Land

Other Land

N

0 1 2 4

Miles

Source: CA Dept. of Conservation 2010
ESRI 2011

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Plate 3.11-1
Important Farmland Within the Study Area

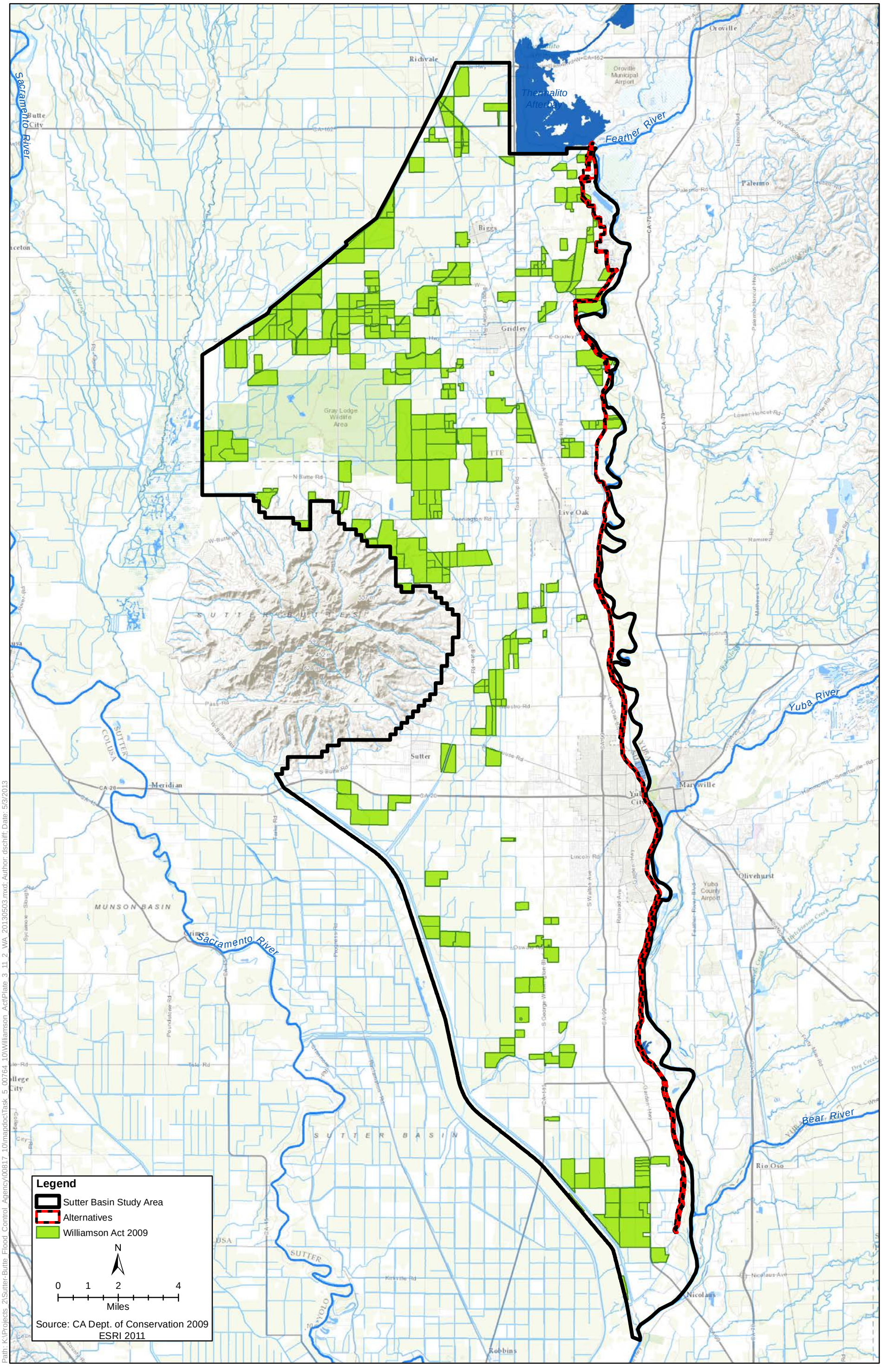


Plate 3.11-2
Williamson Act Lands in the Study Area

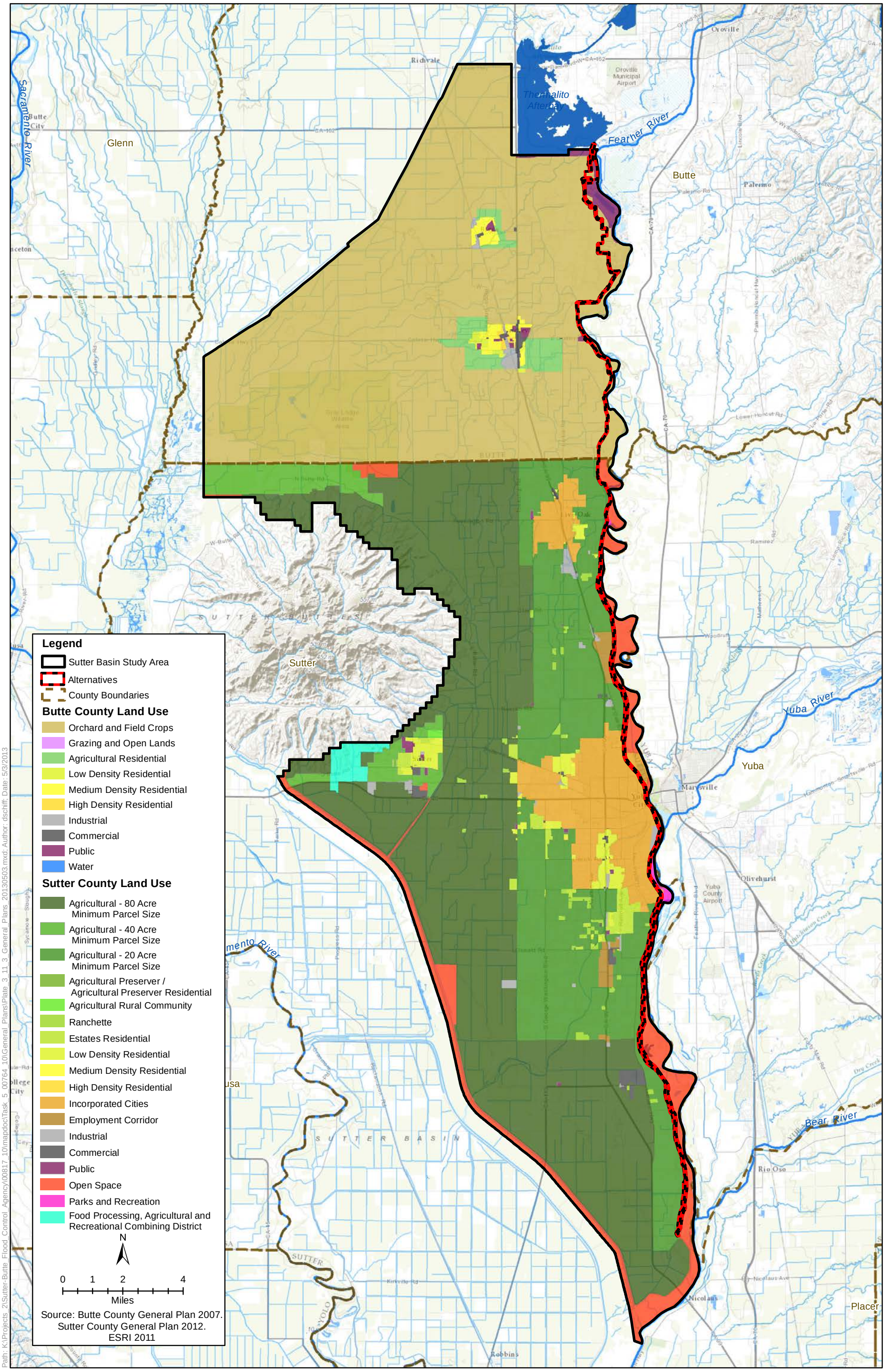
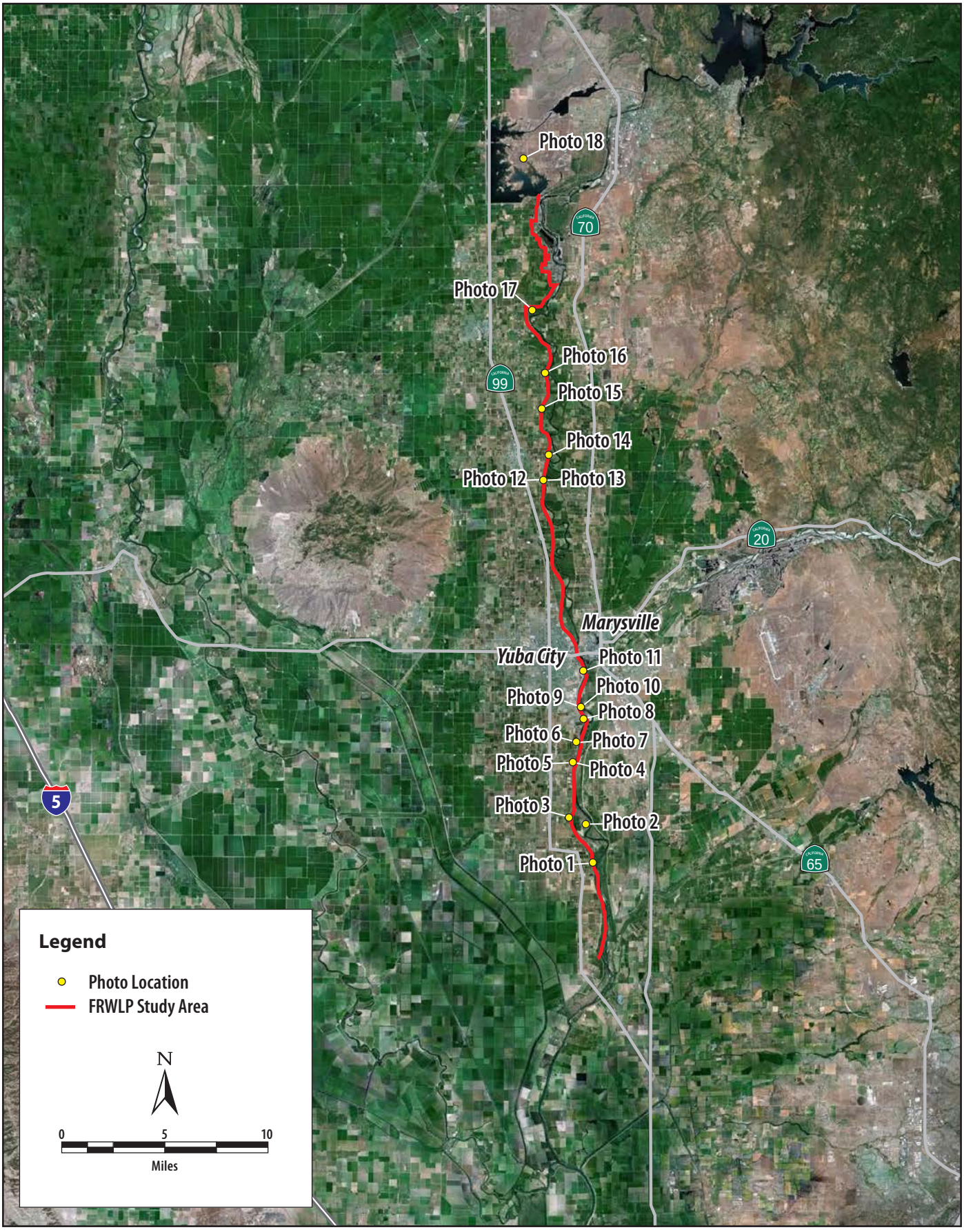


Plate 3.11-3
Land Use Designations Within the Study Area



Graphics ...0085.2.10 (6/19/12) AB

Plate 3.13-1
Representative Photograph Locations

Photo 1. Within Reach 5, view from atop the levee, looking west over view adjacent orchards.

Photo 2. View looking south over adjacent agricultural fields near Star Bend.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 3. Within Reach 7, view from atop the levee, looking west over adjacent agricultural land.

Photo 4. View looking north toward the Sierra Gold Nursery.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 5. View of Feather River looking south near the Sierra Gold Nursery.

Photo 6. Within Reach 10, view from atop the levee, looking west over Garden Highway to adjacent orchards.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 7. Within Reach 10, view from atop the levee, looking southeast at riparian vegetation associated with the Feather River.

Photo 8. View from atop the levee, looking west over vegetation to a residential subdivision in Yuba City.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 9. View from atop the levee, looking southeast at riparian vegetation adjacent to the Feather River.

Photo 10. View from atop the levee, looking northwest towards a residential subdivision within Yuba City.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 11. View from atop the levee looking northwest at the Sutter County Airport.

Photo 12. View from atop the levee looking southwest.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 13. View from atop the levee looking north at an adjacent structure.

Photo 14. View from atop the levee looking northeast at the Live Oak Park and Recreation Area.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 15. View from atop the levee looking north at adjacent orchards.

Photo 16. View from atop the levee looking southwest at adjacent vineyard located within the Feather River corridor.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

Photo 17. View looking east toward East Gridley Road Bridge over the Feather River with agricultural fields in the floodplain.

Photo 18. View of Sutter Buttes in the background, looking southwest from Thermalito Afterbay.

Graphics ...00852.10 (6/19/12) AB

Plate 3.13-2
Representative Photographs

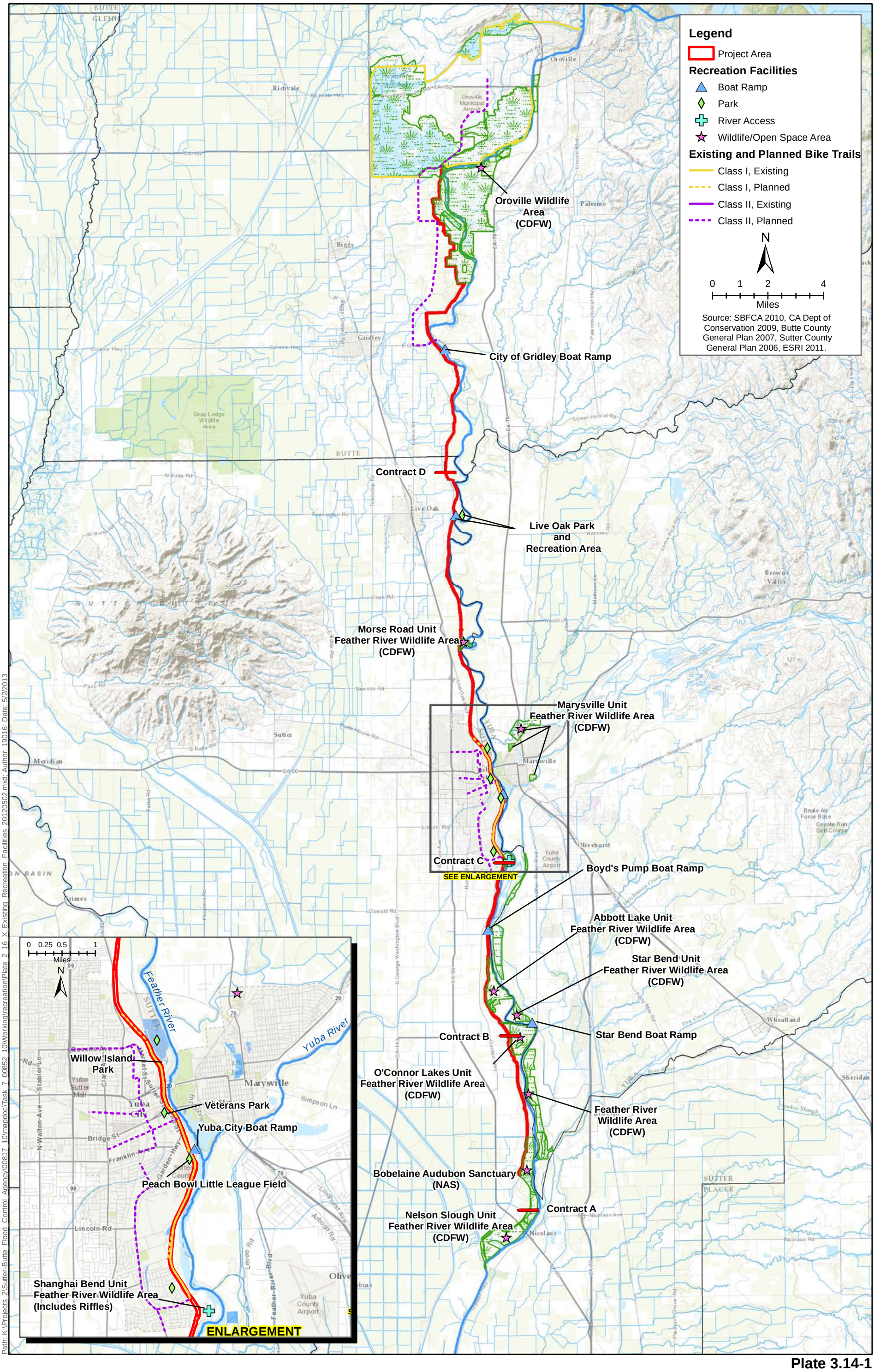


Plate 3.14-1
Existing Recreation Facilities
Near the Project Area

FINAL

FEATHER RIVER WEST LEVEE PROJECT
RESPONSES TO COMMENTS

PREPARED FOR:

U.S. Army Corps of Engineers
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Sacramento, CA 95814
Contact: Jeff Koschak

Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991
Contact: Mike Inamine

PREPARED BY:

ICF International
640 K Street, Suite 400
Sacramento, CA 95814
Contact: Chris Elliott
916.737.3000

June 2013

ICF International. 2013. *Feather River West Levee Project Part II—Responses to Comments*. Final. June. (ICF 00852.10.) Sacramento, CA. Prepared for U.S. Army Corp of Engineers, Sacramento, CA, and Sutter Butte Flood Control Agency, Yuba City, CA.

Contents

Part II Responses to Comments

Tables

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Acronyms, Abbreviations, and Shortened Forms

BA	biological assessment
BMPs	best management practices
BO	biological opinion
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CVFPB	Central Valley Flood Protection Board
DWR	California Department of Water Resources
EIR	environmental impact report
EIS	environmental impact statement
FEMA	Federal Emergency Management Agency
FRWA	Fern Ridge Wildlife Area
FRWLP	Feather River West Levee Project
GPS	global positioning system
HCP	habitat conservation plan
ICF	ICF International
ITP	incidental take permit
LD	Levee District
LEDPA	least environmentally damaging practicable alternative
MLD	most-likely descendant
MMP	mitigation and monitoring plan
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NGOs	non-governmental organizations
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_X	oxides of nitrogen
NRDC	Natural Resources Defense Council
O&M	operations and maintenance
OHWM	ordinary high water mark
OWA	Oroville Wildlife Area
PG&E	Pacific Gas and Electric Company
SACOG	Sacramento Area Council of Governments
SBFCA	Sutter Butte Flood Control Agency
SFHA	Special Flood Hazard Area
SIP	state implementation plan
SOI	sphere of influence
SWPPP	stormwater pollution prevention plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VELB	valley elderberry longhorn beetle

Chapter 1
Introduction

The Feather River West Levee Project (FRWLP) Draft environmental impact statement/environmental impact report (EIS/EIR) was circulated for public review in December 2012 with a public comment period of 49 days, between December 27, 2012 and February 13, 2013. Thirty-one comments were submitted on the Draft EIS/EIR, including those from the following commenters.

- Three Federal agencies.
- One tribal government.
- Three state agencies.
- Thirteen individuals (written comments).
- Twenty-one individuals (audible oral comments recorded at three public hearings).
- Five non-governmental organizations (NGOs) or other organizations.

The majority of comments received were related to one or more of the following topic areas.

- Concern regarding U.S. Army Corps of Engineers (USACE) levee vegetation policy as it relates to the FRWLP.
- Concern regarding the adequate analysis of recreation and public access impacts.
- Questions and comments on the analysis of wildlife and vegetation resources.
- Questions and comments on hydraulic and flooding impacts.
- Questions and comments on property acquisition.
- Questions and comments on the analysis of alternatives presented.
- Questions and comments on the analysis of growth inducing impacts.
- Other miscellaneous comments.

Chapters 2 through 4 present the full comments and detailed responses, organized by public agencies and tribal organizations, NGOs or other organizations, individuals, and public hearings. Each comment in the following chapters has been considered and responded to individually. If a comment resulted in a change to the Final EIS, it is noted within the comment's response. USACE coordinated with SBFCA to prepare responses to comments associated with the California Environmental Quality Act (CEQA) process and other specific issues related to SBFCA's authorities and project design and construction.

This EIS/EIR was initiated as a joint document with USACE involvement pursuant to its authority under 33 U.S.C. Section 408 and as the lead National Environmental Policy Act (NEPA) agency, and with the Sutter Butte Flood Control Agency (SBFCA) as the project applicant and the CEQA lead agency. The Draft EIS/EIR was written with joint NEPA and CEQA language to characterize the cooperation of the two agencies on the FRWLP. Since the release of the Draft EIS/EIR, the NEPA and CEQA processes have been separated and are now represented by a stand-alone EIS and a stand-alone EIR, respectively. It should be noted that the language in this EIS has not been modified to NEPA-only; it maintains the joint language used when environmental analysis was initiated on the FRWLP.

Chapter 2
Federal, Tribal, and State Agency Comments and Responses

This chapter contains the comments received on the Draft EIS/EIR from Federal, tribal, and state agencies. The comment letters are subdivided by level of government and each agency has been assigned a unique code. Each comment within the letter has also been assigned a unique code, noted in the margin. For example, the code "F2-A" indicates the first distinct comment (indicated by the "A") in the letter from the U.S. Department of the Interior, which was the second letter (indicated by the "2") received from a Federal agency (indicated by the "F"). The chapter presents each comment letter immediately followed by the responses to that letter. Table 2-1 summarizes the commenting party, comment letter signatory, and date of the comment letters.

Table 2-1. List of Federal, Tribal, and State Agency and Comment Letters

Letter	Agency	Comment Letter Signatory, Date
2.1 Federal Agency Comments and Responses		
F1	U.S. Environmental Protection Agency, Region IX	Kathleen Goforth, February 15, 2013
F2	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region	Patricia Sanderson Port, Regional Environmental Officer, February 25, 2013
F3	U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Region	Maria Rea, Supervisor, Central Valley Office, February 26, 2013
2.2 Tribal Comments and Responses		
T1	United Auburn Indian Community of the Auburn Rancheria	Gene Whitehouse, Chairman, February 13, 2013
2.3 State Agency Comments and Responses		
S1	California Department of Water Resources, Division of Operations and Maintenance	Leroy Ellinghouse, Chief of the SWP Encroachments Section, January 19, 2013
S2	California Department of Water Resources, Division of Operations and Maintenance	Leroy Ellinghouse, Chief of the SWP Encroachments Section, January 22, 2013
S3	California Department of Water Resources	Erin Brehmer, Environmental Scientist, February 11, 2013
S4	California Department of Fish and Wildlife	Tina Bartlett, Regional Manager, February 11, 2013
S5	California State Lands Commission, Division of Environmental Planning and Management	Cy R. Oggins, Chief, February 11, 2013

2.1 Federal Agency Comments and Responses

Letter F1—U.S. Environmental Protection Agency, Region IX, Kathleen Goforth, February 15, 2013

Letter F1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

FEB 11 2013

Jeff Koschak
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

Subject: Feather River West Levee Project Draft Environmental Impact Statement (DEIS)/ Environmental Impact Report, Butte and Sutter Counties, California [CEQ #20120399]

Dear Mr. Koschak:

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) NEPA Implementation Regulations at 40 CFR 1500 - 1508, and our review authority under Section 309 of the Clean Air Act.

F1-A EPA has rated the DEIS as EC-2 -- Environmental Concerns-Insufficient Information" (see Enclosure 1: "Summary of Rating Definitions and Follow-Up Action") because it is unclear whether significant impacts to waters of the U.S. and sensitive species and habitats would be effectively avoided and/or mitigated. The Final Environmental Impact Statement (FEIS) should include additional information to demonstrate that the preferred alternative is the least environmentally damaging practicable alternative to meet the project purpose, and describe and discuss options for mitigating impacts to waters of the U.S. The FEIS should also include additional information regarding sensitive species and habitats in the project area, air pollutant emissions during project construction, and mitigation measures to minimize project impacts. Our detailed comments are enclosed (see Enclosure 2).

We appreciate the opportunity to review this DEIS. Please send a hard copy of the FEIS to this office (mailcode CED-2) when it is officially filed with EPA's new electronic EIS submittal tool: *e-NEPA*. If you have any questions, please call me at (415) 972-3521 or contact Jeanne Geselbracht, our lead NEPA reviewer for this project, at geselbracht.jeanne@epa.gov or (415) 972-3853.

Sincerely,

Kathleen Martyn Goforth, Manager
Environmental Review Office (CED-2)

Enclosures:
(1) Summary of Rating Definitions and Follow-Up Action
(2) EPA's detailed comments on the Feather River West Levee Project DEIS

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

Feather River West Levee Project DEIS
EPA Comments – February, 2013

Water Quality

F1-B Table 3.8-6 in the DEIS provides acreages of waters of the U.S. that could be affected under each project alternative. These acreages appear to be based on jurisdictional delineations conducted by the Sutter Butte Flood Control Agency (SBFCA). The table may be incomplete, however, as it does not include acreages that could be affected by activities at borrow sites. Furthermore, the DEIS does not indicate whether these delineations have been verified by the U.S. Army Corps of Engineers (Corps). Lacking this information, it is difficult to determine the extent of potential impacts to waters of the U.S. and whether sufficient avoidance measures have been considered.

Recommendation: For each alternative, the FEIS should provide verified acreages and types of potentially affected waters of the U.S., including those at borrow sites. Maps should be provided illustrating the locations and types of waters of the U.S. in relation to the proposed project footprint for each alternative.

F1-C Levee repair activities under any of the project alternatives would result in fill of waters of the U.S., which would require Clean Water Act Section 404 authorization by the Corps. To comply with Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the Clean Water Act, any permitted discharge into waters of the U.S. must be the least environmentally damaging practicable alternative (LEDPA) available to achieve the project purpose. The DEIS does not provide an alternatives analysis that adequately demonstrates whether Alternative 3 is the LEDPA.

Recommendation: The FEIS should identify the LEDPA, and explain the basis for this designation.

F1-D The DEIS (pp. 3.8-23, 24) indicates that SBFCA will develop, in coordination with regulatory agencies, a restoration plan for compensation for the loss of wetlands. The plan will include restoring or enhancing in-kind wetland habitat and open-water habitat at a mitigation ratio to ensure no net loss of habitat functions and values. Further details on how project impacts would be offset are not available in the DEIS, and it is unclear what mitigation options exist for the project (e.g., mitigation bank credits or off-site permittee-responsible projects). We note that an off-site permittee-responsible project could be appropriate, if it would support a watershed approach to aquatic resource management (such as contributing to existing regional conservation plans), and "will restore an outstanding resource based on a rigorous scientific and technical analysis" (40 CFR 230.93(b)(2)).

Recommendations:

- The FEIS should identify and discuss mitigation options for the proposed project, including where they would be located, how they would be conducted, and how they would comply with the Federal Mitigation Rule (40 CFR Part 230, Subpart J). If a mitigation bank or in-lieu fee (ILF) program would be used, the FEIS should identify the site, confirm that it is meeting or has met its performance standards, and that the types of mitigation needed are available at that site.
- If sufficient bank or ILF credits are not available, EPA recommends that the Corps only approve permittee-responsible mitigation at sites selected using a watershed approach to restoration of ecosystem functions and services, and where activities are likely to be successful and naturally self-sustaining.
- Please contact Paul Jones, EPA Wetlands Office, at (415) 972-3470 or jones.paul@epa.gov, to continue discussion of the LEDPA and mitigation plan.

The DEIS (p. 2-33) indicates that small, isolated infestations of invasive plant species would be treated with eradication methods that have been approved by or developed in conjunction with the Sutter and Butte county agricultural commissioners. It is unclear, however, whether these same methods would, potentially, be used for large infestations, and whether eradication methods would include chemical treatment.

F1-E **Recommendation:** The FEIS should clarify whether large infestations would be treated with the same eradication methods as those used for small infestations, identify the approved eradication methods for both, and discuss whether pesticides might be used for small or large invasive plant infestations. If pesticides would, potentially, be used, the FEIS should identify the pesticides and state the provisions for their use. This discussion should include actions needed to comply with the California National Pollutant Discharge Elimination System permit for Aquatic Weed Control pesticide applications, which is under revision and scheduled for reissuance in 2013. Note that both the existing and proposed versions of the California permit require advance submission of an Aquatic Pesticide Application Plan, in some cases 90 days in advance. More information is available at http://www.swrcb.ca.gov/water_issues/programs/npdes/aquatic.shtml

Air Quality

The DEIS provides construction emissions estimates for each alternative in pounds per day and tons per year for purposes of comparing them with the general conformity de minimis thresholds. It appears that the proposed project's direct and indirect contaminant emissions have not been modeled to show their estimated
F1-F *concentrations* in the project area for each alternative for an accurate comparison with the NAAQS.

Recommendation: Additional dispersion modeling should be conducted to determine air pollutant concentrations of criteria pollutants from direct, indirect, and cumulative emissions for an accurate comparison with the NAAQS, using comparable units (e.g. micrograms per cubic meter, parts per billion, or parts per million). The Final EIS should include this additional information.

Biological Resources

The DEIS identifies several special-status fish and wildlife species in the project area, including the endangered Sacramento River winter-run Chinook salmon, and the threatened green sturgeon, Central Valley steelhead, Central Valley spring-run Chinook salmon, valley elderberry longhorn beetle, and giant garter snake. The Feather River in the study area is designated critical habitat for green sturgeon, Central Valley steelhead, and Central Valley spring-run Chinook salmon. According to the DEIS, habitat surveys will be conducted for the valley elderberry longhorn beetle, giant garter snake, and several other special-status species before construction begins. These surveys should be completed prior to publication of the FEIS so that development of
F1-G appropriate avoidance and mitigation measures to minimize significant impacts to these resources can be completed, and the impacts of project alternatives and the effectiveness of associated mitigation measures can be compared and assessed in the FEIS. Furthermore, the Biological Opinion will play an important role in informing the decision on alternative approval and what commitments, terms, and conditions must accompany that approval.

Recommendation: The Final EIS should include the biological opinion and incorporate sufficient information on the special-status habitat surveys and compensatory mitigation proposals to show how mitigation commitments will be conducted and how effective they are expected to be in minimizing significant impacts.

F1-H The DEIS (Table 3.8-6) indicates that the preferred alternative would result in the loss of at least 21 acres of riparian habitat. According to page 3.8-21, a riparian habitat mitigation and monitoring plan will be prepared by a qualified restoration ecologist prior to vegetation removal, and potential mitigation areas would be evaluated to determine their suitability to support the target native tree species. While the DEIS (p. 3.8-29)

F1-H cont'd

states that the disturbance or removal of this habitat would be a significant impact, it also states that the impact would be less than significant in the long term after establishment of compensatory vegetation. However, a habitat suitability evaluation and restoration mitigation and monitoring plan have not yet been prepared; therefore, it is unclear how or where these restoration activities would occur. As is the case for the special-status species discussed above, these habitat surveys should be completed prior to publication of the FEIS so that development of appropriate avoidance and mitigation measures to minimize significant impacts to these resources can be completed, and the impacts of project alternatives and the effectiveness of associated mitigation measures can be compared and assessed in the FEIS.

Recommendation: The FEIS should include a summary of the habitat suitability evaluation, avoidance measures, and restoration mitigation and monitoring plan, including commitments regarding how and where restoration activities would occur. The FEIS should also discuss these commitments in the context of their anticipated effectiveness in minimizing significant impacts.

F1-I

The DEIS (p. 3.8-30) states that implementation of Alternative 3 would result in greater effects on oak woodland and the open water land cover type than would Alternatives 1 and 2, but this statement conflicts with Table 3.8-6. This inconsistency should be rectified in the FEIS.

Response to Letter F1

F1-A

Effects on waters of the United States and special status plants are described in Effect VEG-2 and VEG-4 (loss of wetlands, loss of special status plant populations); mitigation is required in Mitigation Measures VEG-MM-5 (compensate for loss of wetlands) and VEG-MM-8 and VEG-MM-9 (survey for special status plants, compensate for effects). Effects and mitigation measures for air quality are covered in Chapter 3.5, *Air Quality*.

A least environmentally damaging practicable alternative (LEDPA) has not been identified because it is not anticipated that effects on waters of the United States will be permitted through an individual permit. It is acknowledged that, in most cases, National Environmental Policy Act (NEPA) analysis for USACE actions requires consideration of the LEDPA if the project will require an individual permit (40 Code of Federal Regulations [CFR] 230.10[a][4]). However, USACE has determined that the FRWLP can be permitted through the Nationwide Permit program, for which NEPA analysis is considered complete and a project-specific 404(b)(1) alternatives analysis and LEDPA determination are not required. These circumstances have been reflected in the Final EIS in Chapter 5. Please refer to the response to comments F1-B, F1-D, F1-F, and F1-G.

F1-B

The commenter suggests that the EIS should report verified acreages for waters of the United States for each alternative. SBFCA has prepared a delineation of jurisdictional waters for both the levee repair alternatives and the borrow sites for the project area, including a buffer that should encompass each alternative. USACE has reviewedthese documents and has issued a preliminary jurisdictional determination. The results of the effects of each alternative overlain on the verified delineation are shown in revised Table 3.8-6.

F1-C

Please see response to comment F1-A above.

F1-D

The commenter suggests that SBFCA should identify the specific site where mitigation will be located for the project. SBFCA has prepared a mitigation and monitoring plan (MMP) to perform mitigation for effects to waters of the U.S., trees, woody vegetation and habitat for giant garter snake and valley elderberry longhorn beetle under the direction of USACE, National Marine Fishers Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW). The proposed project mitigation will be in-kind replacement habitat that is a combination of permittee-responsible mitigation and mitigation bank credits that will allow for economy of scale and higher quality habitat due to large patch size. The MMP is included as Appendix F.3. Comment did not necessitate change to the Final EIS.

F1-E

The project will utilize seed mix from construction specifications and the stormwater pollution prevention plan (SWPPP) that will prevent colonization of invasive weeds. Operations and Maintenance measures that are presently in place, including timed mowing and burning, also

prevent weed growth. Pesticides are not currently being considered for use in eradication; however, if that became necessary, SBFCA will coordinate appropriately with the local maintaining agencies to ensure they are applied to meet standards. Also, no disturbance of aquatic sites is anticipated so no infestations of aquatic weeds would by induced by the project. Comment did not necessitate change to the Final EIS.

F1-F

The commenter has indicated that, while the Draft EIS/EIR analyzes mass emissions for comparison to the general conformity *de minimis* thresholds, the analysis should perform dispersion modeling to determine if direct, indirect, and cumulative emissions would exceed the National Ambient Air Quality Standards (NAAQS). Because of the site-specific detail required to estimate air pollutant concentrations through dispersion modeling (e.g., scheduling, location, and duration of construction activities; equipment inventory, etc.), it was felt that sufficient data is not available in detail to accurately estimate air pollutant concentrations for comparison to the NAAQS and to do so would be speculative given the size and scope of potential construction activities. Therefore, a surrogate analysis using General Conformity was used to evaluate the project's potential to exceed the NAAQS, as the purpose of General Conformity is to (1) ensure Federal activities do not interfere with the budgets in the state implementation plans (SIPs); (2) ensure actions do not cause or contribute to new violations; and (3) ensure attainment and maintenance of the NAAQS.

As indicated in the Draft EIS/EIR, emissions associated with Alternatives 1 and 3 would not exceed the General Conformity *de minimis* thresholds. Therefore, consistent with the General Conformity rule, these emissions would not be subject to a General Conformity determination and are presumed to not cause or contribute to new violations and ensure attainment and maintenance of the NAAQS. The Draft EIS/EIR also indicates that emissions associated with Alternative 2 would exceed the General Conformity *de minimis* thresholds for oxides of nitrogen (NO_X). Consequently, a General Conformity determination was prepared for Alternative 2 to demonstrate that total direct and indirect emissions of NO_X associated with Alternative 2 would conform to the appropriate ozone SIP.

However, USACE and SBFCA have determined that Alternative 2 is not the preferred alternative and emissions associated with Alternative 3, the applicant-preferred alternative (APA), are below the applicable General Conformity *de minimis* thresholds. Therefore, the General Conformity Determination previously presented in the Draft EIS/EIR has been removed and is not included in the Final EIS. Text has been added on page 3.5-4 to address this issue.

Text has been added on page 3.5-12 to indicate coordination with Feather River Air Quality Management District (FRAQMD) and Butte County Air Quality Management District (BCAQMD) staff regarding these issues.

F1-G

Because the project area is so large and would be constructed in phases over multiple years, it is not feasible to conduct surveys for all special-status species prior to publication of the Final EIS. Valley elderberry longhorn beetle (VELB) surveys have been conducted for all visible elderberry shrubs (and shrub clusters) within 100 feet of the maximum extent of the alternative boundaries were mapped with global positioning system (GPS) and recorded. When the bases of shrubs were accessible, stem counts, heights, and widths of shrubs were recorded, and shrubs were surveyed for VELB exit holes. Where there wasn't property access, or where dense poison oak, blackberry, and/or other vegetation surrounds elderberry shrubs, stem counts and exit hole surveys could not be

conducted. Pre-construction surveys will be repeated for all shrubs to be removed prior to transplantation (see Section 3.9.4.2). An assessment of giant garter snake habitat has been conducted and the areas of suitable habitat have been refined. Data are available for several years of bank swallow surveys along the Feather River. An assessment of habitat for the beetles and yellow-billed cuckoo has been conducted, and the areas of suitable habitat have been refined. Swainson's hawk and other nesting raptor surveys began in March 2013 and will be conducted prior to each Contract construction season. All available habitat assessment/survey info and mitigation have been included in the Final EIS (see Section 3.9 *Wildlife*).

Biological assessments were completed and submitted to the NMFS and USFWS in March 2013. The NMFS letter of concurrence and USFWS BO are included in Appendix F in the Final EIS.

F1-H

An MMP has been developed for the project and is included as Appendix F.3. The proposed project mitigation will be offsite, in-kind replacement habitat that is a combination of permittee-responsible mitigation and mitigation bank credits that will allow for economy of scale and higher quality habitat due to large patch size. Comment did not necessitate change to the Final EIS.

F1-I

Comment noted. Table 3.8-6 and corresponding text have been updated appropriately in the Final EIS.

Letter F2—U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region, Patricia Sanderson Port, Regional Environmental Officer, February 25, 2013

Letter F2

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
333 Bush Street, Suite 515
San Francisco, CA 94104

IN REPLY REFER TO:
(ER 12/922)

Filed Electronically

25 February 2013

Jeff Koschak
Project Manager
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Subject: Draft Environmental Impact Statement (DEIS), US Army Corps of Engineers (USACE), Feather River West Levee Project, To Reduce Flood Risk in the Sutter Basin, Sutter and Butte Counties, CA

Dear Mr. Koschak:

F2-A The Department of the Interior has received and reviewed the subject document and has no comments to offer.

Thank you for the opportunity to review this project.

Sincerely,

Patricia Sanderson Port

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC
OEPC Staff Contact: Loretta B. Sutton

Response to Letter F2

F2-A

Comment noted. Thank you for taking the time to review the document. Comment did not necessitate change to the Final EIS.

Letter F3—U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Region, February 26, 2013

Letter F3

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

FEB 26 2013

Alicia E. Kirchner
Chief, Planning Division
Department of the Army
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Dear Ms. Kirchner:

F3-A This is in response to your December 20, 2012, letter requesting NOAA's National Marine Fisheries Service's (NMFS) review of the draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Feather River West Levee Project. The Sutter Butte Flood Control Agency is requesting permission for the U.S. Army Corps of Engineers (Corps) to address known levee deficiencies by remediating sections of this Corps levee.

The proposed project as described by the preferred alternative in the draft EIS/EIR involves: (1) installing approximately 34 miles of soil and bentonite cutoff walls (0.68 mile with associated ditch fill); (2) constructing 0.72 mile of seepage berms; (3) placing 0.42 mile of ditch fill; (4) dredging 1.8 miles of canal; and (5) relocating or removing encroachments along approximately 3.44 miles of the Feather River west levee. The proposed project area would extend approximately 41 miles from the Thermalito Afterbay downstream of Oroville Dam south to a point approximately 1.7 miles north of the State Highway 99 Bridge over the Feather River. When completed, the proposed project would reduce potential flooding, flood damages, and public risk by eliminating or reducing these known levee deficiencies, including through- and under-seepage, slope instability, erosion, and encroachments within the construction footprint. While NMFS appreciates the opportunity to review the draft EIS/EIR, our staff currently does not have the time allocated for a detailed review.

In addition to the proposed project described above, NMFS has recently been requested to participate in the following projects:

(1) The plenary process to assist with identification of avoidance and minimization measures, design of self-mitigating sites where appropriate, and assistance in evaluating potential mitigation options for the American River Common Features General Reevaluation Report. This will likely be a complex and lengthy project.

(2) All future and current phases of the Sacramento River Bank Protection Project (Sacramento Bank). NMFS recently provided comments to the Corps on the

administrative draft Biological Assessment for the Sacramento Bank, Phase II 80,000 Linear Feet.

F3-A (3) As part of the Rehabilitation and Inspection Program, the Corps has requested that NMFS review designated levees in relation to adjacency to listed NOAA Fisheries species or critical habitat. These levees would in turn be compared to Corps inspection criteria. The purpose of this project is to assist the Corps in determining a consultation priority order.

(4) In the preparation of an environmental impact statement (EIS) for the Sacramento-San Joaquin Delta Islands and Levees Feasibility Study (Delta Study). The Delta Study and subsequent EIS will analyze the environmental impacts associated with alternatives for restoring sustainable ecosystem functions and improving flood risk management in the Delta, Suisun Marsh, and adjacent areas.

The Corps is anticipating active participation from NMFS staff for all of the above projects. The Sacramento Bank project alone would require substantial NMFS staff time if active participation is the goal. Adding any of the other mentioned projects to the work load would only enhance any time commitment.

Currently, there is no specific funding in place for any of the above mentioned projects, thus the allocation of staff time is a challenge. As such, to ensure NMFS participation meets the expectations and needs of the Corps, NMFS requests funding support through an interagency agreement. Without this support, the level of NMFS participation is unknown due to ongoing staff support of other projects to which NMFS is already obligated.

NMFS requests that you and Colonel William J. Leady arrange a meeting with NMFS Central Valley Office Supervisor, Maria Rea, to discuss this project and other Corps Sacramento District flood management planning efforts. In part, the purpose of this meeting would be to align NMFS staff resources with Corps planning objectives in the Central Valley.

Please contact Michael Hendrick at (916) 930-3605, or via e-mail at Michael.Hendrick@noaa.gov if you have any questions or require additional information.

Sincerely,

Maria Rea
Supervisor, Central Valley Office

cc: Copy to file: ARN 151422SWR2013SA00015
NMFS-PRD, Long Beach, CA

Response to Letter F3

F3-A

Comment noted. No response required. Comment did not necessitate change to the Final EIS.

2.2 Tribal Comments and Responses

Letter T1—United Auburn Indian Community of the Auburn Rancheria, Gene Whitehouse, Chairman, February 13, 2013

Letter T1

MIWOK MAIDU United Auburn Indian Community of the Auburn Rancheria

Gene Whitehouse, Chairman | John L. Williams, Vice Chairman | Don Rey Jr., Secretary | Brenda Adams, Treasurer | Calvin Moman, Council Member

February 13, 2012

Alicia E. Kirchner
Chief, Planning Division
Department Of The Army
U.S. Army Engineer District, Sacramento
Corps Of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Feather River West Levee Project

Dear Ms. Kirchner:

Thank you for initiating formal consultations with the United Auburn Indian Community (UAIC) of the Auburn Rancheria on the proposed Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Feather River West Levee Project (FRWLP). The UAIC is comprised of Miwok and Nisenan (Southern Maidu) people whose tribal lands are within Placer County and ancestral territory spans across El Dorado, Nevada, Sacramento, Sutter, and Yuba counties. The UAIC is concerned about development within its aboriginal territory that has potential to impact the lifeways, cultural sites, and landscapes that may be of sacred or ceremonial significance. We appreciate the opportunity to comment on this project.

T1-A We have reviewed the DEIS/DEIR FRWLP and found it very disheartening to find that our previous consultation efforts were not included in the Native American Consultation Sections of the report. The UAIC has met with the USACE and ICF on several two occasions to share resource location maps and are still waiting to complete a site visit to known resources. More than one Nisenan ethnographic village known to be in the APE has been disclosed and consulted on with both ICF and the USACE. Archaeological mounds have even been described as still being present and visible in the project area and even below the existing levees. We would like it if both ICF and the USACE include in the DEIS/DEIR FRWLP a record consultation with the UAIC and provide us with any cultural resources reports that have been or will be prepared for this project.

T1-B Based on the information contained in the DEIS/DEIR FRWLP, the UAIC understands that prehistoric cultural resources have been observed within the study area and were any identified as part of the record search process. The Tribe continues to express concern regarding the possibility for discovery of previously unidentified cultural resources and/or subsurface human remains, particularly in the case of ground disturbing activities such as those being proposed.

In order to ascertain whether or not the project could affect cultural resources that may be of importance to the UAIC, we would like to receive copies of any archaeological reports that have been, or will be, completed for the project. We also request copies of future environmental documents for the proposed project so that we have the opportunity to comment on potential impacts and proposed mitigation measures related to cultural resources. The information gathered will provide us with a better understanding of the project and cultural resources on site and is invaluable for consultation purposes.

Tribal Office 10720 Indian Hill Road Auburn, CA 95603 (530) 883-2390 FAX (530) 883-2380

MIWOK MAIDU United Auburn Indian Community of the Auburn Rancheria

Gene Whitehouse Chairman	John L. Williams Vice Chairman	Don Rey Jr. Secretary	Brenda Adams Treasurer	Calvin Moman Council Member

T1-C Please contact us if any Native American cultural resources are in, or found to be within, your project area.

T1-D We would like to make a few general points for consideration in developing the scope and choosing the alternative for the DEIS/DEIR FRWLP:

- The UAIC recommends that projects within the DEIS/DEIR FRWLP jurisdiction be designed to incorporate known cultural sites into open space or other protected areas;
- The UAIC would like the opportunity to provide Tribal representatives to monitor projects if excavation and data recovery are required for prehistoric cultural sites, or in cases where ground disturbance is proposed at or near sensitive cultural resources;
- The UAIC is interested in receiving cultural materials from prehistoric sites where excavation and data recovery has been performed;
- The UAIC would like to receive copies of environmental notices and documents for projects within the jurisdiction of the DEIS/DEIR FRWLP;
- The UAIC would like to receive all confidential cultural and archaeological reports within the jurisdiction of the DEIS/DEIR FRWLP.

T1-E If human remains are discovered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. If the coroner determines that the remains are of Native American origin, the coroner will notify the Native American Heritage Commission, which will notify a Most Likely Descendant (MLD). The MLD shall be responsible for recommending the appropriate disposition of the remains and any grave goods at that time.

T1-F Thank you in advance for taking these matters into consideration, and for involving the UAIC in the planning process as early as possible. We look forward to continuing the consultation and reviewing the any reports upon completion. Please contact Marcos Guerrero, cultural resources specialist, at (530) 883-2364 or email at mguerrero@auburnrancheria.com.

Sincerely,

Gene Whitehouse,
Chairman

CC: Marcos Guerrero, CRM

Tribal Office 10720 Indian Hill Road Auburn, CA 95603 (530) 883-2390 FAX (530) 883-2380

DRAFT

Response to Letter T1

T1-A

Comment noted. Please see the revisions to the "Contact with Interested Parties" section on page 3.17-6. SBFCA is updating the record of all consultations with the Native American community including the United Auburn Indian Community. Please also note that USACE and SBFCA have committed to ongoing consultation with the Native American community in the programmatic agreement being developed for compliance with Section 106 of the National Historic Preservation Act (NHPA); and as the commenter indicated both USACE and SBFCA contractors have met with the Native American community. The record has been updated appropriately and documentation of surveys has been provided. The input and consultation efforts extended by the United Auburn Indian Community are valued and welcomed for the project.

T1-B

Comment noted. SBFCA and USACE welcome the consultation efforts of the United Auburn Indian Community. Documentation of cultural resource management efforts and future environmental documents will be provided when available. USACE will continue to consult with tribes regarding the identification, evaluation, and treatment of cultural resources identified in the area of potential effects (APE). Comment did not necessitate change to the Final EIS.

T1-C

Comment noted. Please refer to the response to comment T1-B above.

T1-D

Comment noted. Please refer to the responses to comments T1-A and T1-B, above.

- The commenter also requests that SBFCA and USACE consider preservation of affected resources in open space. Because flood protection measures are constrained by the location of the existing levees, preservation is not always feasible.
- Please note that SBFCA and USACE will make use of archaeological monitors if appropriate.
- SBFCA and USACE must defer to the California Native American Heritage Commission in designating the most-likely descendant (MLD) under California Public Resources Code Section 5097.98. The MLD will determine how to manage Native American remains and associated objects.
- As stated in responses above, USACE will continue to consult with tribes and will provide documentation of cultural resource and other environmental studies.

T1-E

Comment noted. SBFCA has already committed to compliance with these laws; however, confirmation that these are the applicable statutes is appreciated. Comment did not necessitate change to the Final EIS.

T1-F

Comment noted. SBFCA would like to thank the United Auburn Indian Community for their consultation efforts. Comment did not necessitate change to the Final EIS.

2.3 State Agency Comments and Responses

Letter S1—California Department of Water Resources. Division of Operations and Maintenance, Leroy Ellinghouse, Chief of the SWP Encroachments Section, January 19, 2013

Letter S1

January 19, 2013

U.S. Army Corps of Engineers, Sacramento District
Attn: Mr. Jeff Koschak
1325 J Street
Sacramento, California 95814-2922

S.B. 2161 Review of 4-ORO-29, draft Environmental Impact Statement/Environmental Impact Report for Feather River West Levee Project, U.S. Army Corps of Engineers, Sutter Butte Flood Control Agency, Oroville Field Division, Butte County

Dear Mr. Koschak:

The Sutter Butte Flood Control Agency is requesting permission from the U.S. Army Corps of Engineers to repair sections of the levee along 41 miles of the Feather River. The proposed work would extend south from Thermalito Afterbay to approximately the Route 99 Bridge over the Feather River. The alternatives, including slurry walls, seepage berms, dredging, and removal of unauthorized encroachments, may be viewed at

www.spk.usace.army.mil/

S1-A

The proposed plans indicate that the work may include areas adjacent to the Thermalito Afterbay as well as the River Outlet Works, part of the Department of Water Resources (DWR) Right-of-Way (ROW).

Any development that affects DWR ROW will require an Encroachment Permit from DWR prior to the start of construction. Information on obtaining an encroachment permit from DWR can be viewed at:

http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

Please provide DWR with a copy of any subsequent environmental documentation when it becomes available for public review. Any future correspondence relating to this project should be sent to:

S1-B

Leroy Ellinghouse, Chief
SWP Encroachments Section
Division of Operations and Maintenance
Department of Water Resources
1416 Ninth Street, Room 641-1
Sacramento, California 95814

S1-B cont'd

If you have any questions, please contact Leroy Ellinghouse, Chief of the SWP Encroachments Section, at (916) 653-7168 or Mike Anderson at (916) 653-6664.

Sincerely,

Leroy Ellinghouse, Chief
State Water Project Encroachment Section
Division of Operations and Maintenance

Bcc Dave Duvall, 650
Sheree Edwards, 641-3
Leroy Ellinghouse, 641-2
Pete Scheele, OFD
Bill Dickens, OFD
Paul Dunlap, 605
Angelica Aguilar, 425
Geoff Shumway, 425

M:\HQ\SWP Operations Support\Civil Maint\SWP Encroachment Section\Mike\2161's\4-ORO-29 Army COE upgrades.docx

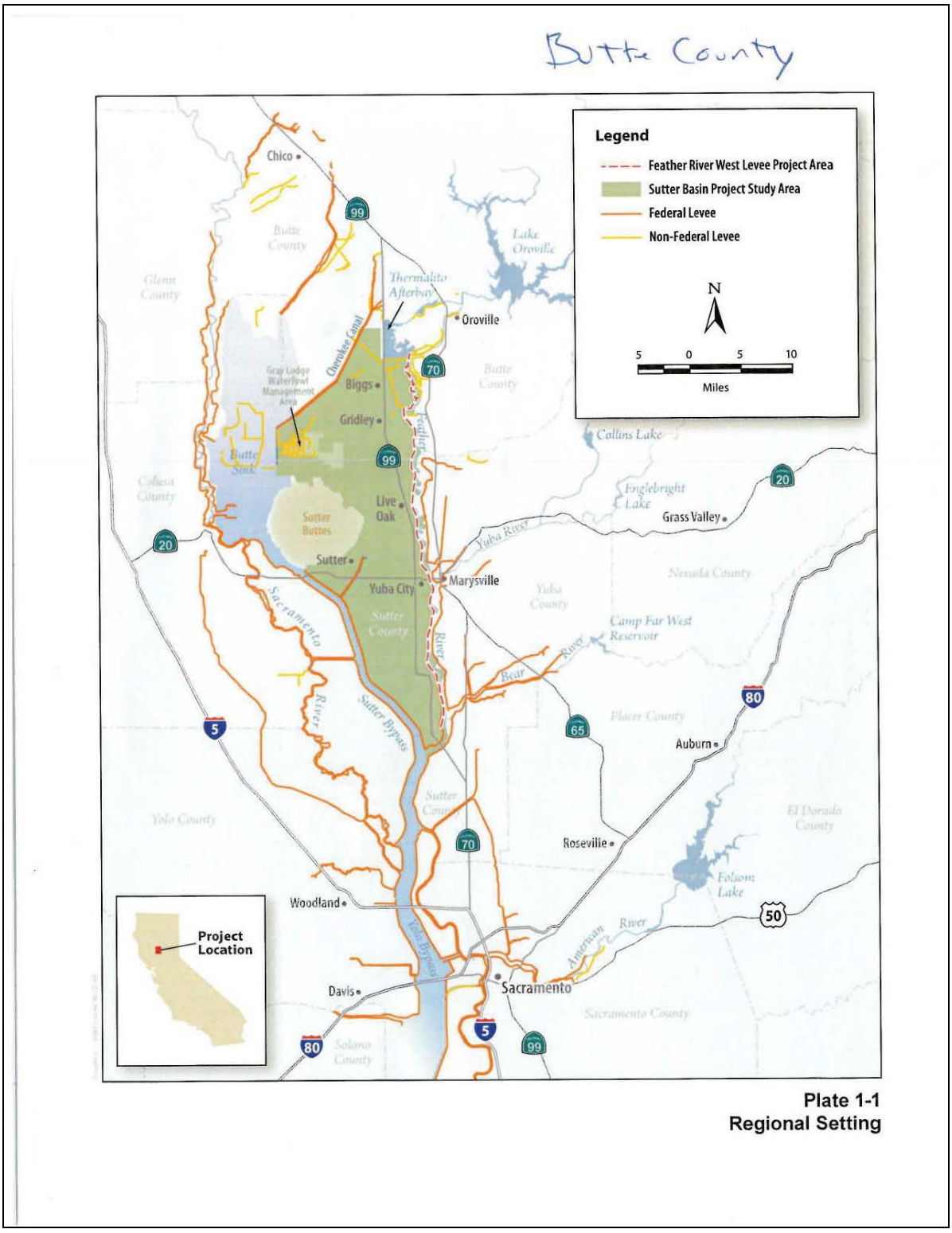

Plate 1-1
Regional Setting

Response to Letter S1

S1-A

Comment noted. SBFCA will obtain an encroachment permit prior to the start of any construction that affects California Department of Water Resources (DWR) right-of-way. Comment did not necessitate change to the Final EIS.

S1-B

Comment noted. SBFCA will provide copies of any subsequent environmental documentation to the contact provided. Comment did not necessitate change to the Final EIS.

Letter S2—California Department of Water Resources. Division of Operations and Maintenance, Leroy Ellinghouse, Chief of the SWP Encroachments Section, January 22, 2013

Letter S2

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY — **EDMUND G. BROWN JR,** *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

January 22, 2013

U.S. Army Corps of Engineers, Sacramento District
Attn: Mr. Jeff Koschak
1325 J Street
Sacramento, California 95814-2922

S.B. 2161 Review of 4-ORO-29, Draft Environmental Impact Statement/Environmental Impact Report for Feather River West Levee Project, U.S. Army Corps of Engineers, Sutter Butte Flood Control Agency, Oroville Field Division, Butte County

Dear Mr. Koschak:

S2-A

The Sutter Butte Flood Control Agency is requesting permission from the U.S. Army Corps of Engineers to repair sections of the levee along 41 miles of the Feather River. The proposed work would extend south from Thermalito Afterbay to approximately the Route 99 Bridge over the Feather River. The proposed plans indicate that the work may include areas adjacent to the Thermalito Afterbay as well as the River Outlet Works, part of the Department of Water Resources (DWR) Right-of-Way (ROW).

Any development that affects DWR ROW will require an Encroachment Permit or Agreement from DWR prior to the start of construction. Information on obtaining an Encroachment Permit from DWR can be viewed at:

http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

S2-B

Please provide DWR with a copy of any subsequent environmental documentation when it becomes available for public review. Any future correspondence relating to this project should be sent to:

Leroy Ellinghouse, Chief
SWP Encroachments Section
Division of Operations and Maintenance
Department of Water Resources
1416 Ninth Street, Room 641-1
Sacramento, California 95814

S2-B cont'd

If you have any questions, please contact Leroy Ellinghouse, Chief of the SWP Encroachments Section, at (916) 653-7168 or Mike Anderson at (916) 653-6664.

Sincerely,

Leroy Ellinghouse, Chief
State Water Project Encroachment Section
Division of Operations and Maintenance

Response to Letter S2

S2-A

Comment noted. SBFCA will obtain an encroachment permit prior to the start of any construction that affects California Department of Water Resources (DWR) right-of-way. Comment did not necessitate change to the Final EIS.

S2-B

Comment noted. SBFCA will provide copies of any subsequent environmental documentation to the contact provided. Comment did not necessitate change to the Final EIS.

Letter S3—California Department of Water Resources, Erin Brehmer, Environmental Scientist, February 11, 2013

Letter S3

From: Brehmer, Erin@DWR [mailto:Erin.Brehmer@water.ca.gov]
Sent: Monday, February 11, 2013 3:57 PM
To: Norgaard, Ingrid
Cc: Unger, Ronald@DWR; Fasani, Jennifer@DWR
Subject: Feather River West Levee comments

Please find comments for the FRWLP below:

FRWLP 408 permission EIS/EIR comments

S3-A

Chapter 3.6.4 Climate Change and Greenhouse Gas:

Recommend using language from Central Valley Flood Protection Plan section 3.7. Please see link below.

S3-B

Chapter 4.2.4.6 Cumulative Impacts, Climate Change:

The Central Valley Flood Protection Plan determined that this does not have a significant impact. Recommend using language from Central Valley Flood Protection Plan section 4.4.2. Please see link below.

http://www.water.ca.gov/cvfmp/documents.cfm

Sincerely,

Erin Brehmer
Environmental Scientist
DWR: Division of Flood Management
Flood Corridor Program and Environmental Support
3464 El Camino Avenue, Suite 200
Sacramento, Ca. 95821

(916)574-2313
erin.brehmer@water.ca.gov

Response to Letter S3

S3-A

Language taken from discussion on California Department of Water Resources (DWR) strategies in the *Climate Change Adaptation Strategies for California's Water* white paper on pages 3.7-31 to 32 in the Central Valley Flood Protection Plan Programmatic EIR Section 3, is now included under "Existing Flood Risk Management Activities" in Section 3.6.2.2, *Environmental Setting*, in the FRWLP EIS.

S3-B

Language taken from the *Climate Change and Greenhouse Gases* discussion on pages 4.32 to 4.33 in the Central Valley Flood Protection Plan Programmatic EIR Section 4, is now included in Section 4.2.4.6, *Climate Change*, in the FRWLP EIS.

Letter S4—California Department of Fish and Wildlife, Tina Bartlett, Regional Manager, February 11, 2013

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region/Region 2
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
www.cdfw.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

Letter S4

February 11, 2013

Jeff Koschak (CESPK-PD-RP)
U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Subject: Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Feather River West Levee Project, SCH# 2011052062, Butte and Sutter Counties

Dear Mr Koschak:

S4-A On September 27, 2012, the California Department of Fish and Game, now known as the California Department of Fish and Wildlife (Department), received a draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) from the U.S. Army Corps of Engineers, requesting comments on the Sutter Butte Flood Control Agency's (SBFCA) proposed Feather River West Levee Project (Project) in Butte and Sutter County. The Department appreciates the U.S. Army Corps of Engineers (Corps) willingness to accept comments on the Project until February 11, 2013. The Department offers the following comments and recommendations on this DEIS/EIR in our role as a trustee and responsible agency Pursuant to Section 15082(b) of the California Environmental Quality Act (CEQA) Guidelines, and the California Public Resource Code §21000 et seq. As a trustee for California's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and their habitat. As a responsible agency, the Department administers the California Endangered Species Act (CESA), the Native Plant Protection Act, and other provisions of the Fish and Game Code (FGC) that conserve the State's fish and wildlife pubic trust resources.

The Department's most substantial environmental concerns relate to the Project's potential impacts to State listed species and habitat, as explained below, and how the Project as proposed may lead to additional cumulative effects.

The comments provided herein are based on the information provided in the DEIS/EIR, our knowledge of species and habitat in the Project area, and our involvement with regional conservation planning efforts. Comments are limited to the Project and alternatives that are likely to result in biological impacts.

Project Overview and Description

The SBFCA Project, as proposed, would involve (1) installing approximately 34 miles of soil and bentonite cutoff walls (0.68 mile with associated ditch fill), (2) constructing 0.72 mile of seepage berms, (3) placing 0.42 mile of ditch fill, (4) dredging 1.8 miles of canal,

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and (5) relocating or removing encroachments along approximately 3.44 miles of the Feather River west levee. The Project area would extend approximately 41 miles from the Thermalito Afterbay downstream of Oroville Dam south to a point approximately 1.7 miles north of the Route 99 bridge over the Feather River. When completed the work would reduce potential flooding, flood damages, and public risk in the Project area by eliminating or reducing these known levee deficiencies, including through- and under-seepage, slope stability, erosion, and encroachments within the construction footprint.

Threatened, Endangered and Special Concern Species

S4-A cont'd

The DEIS/EIR biological analysis discloses that the Project will have impacts to State-listed species and sensitive habitats. Because the Project analyzed a number of alternatives, the final determination of direct and indirect impacts will depend on the preferred Project selected. The Project generally identifies that there will be impacts to riparian habitat, large mature trees, habitat for bank swallow (*Riparia riparia*), giant garter snake (*Thamnophis gigas*) (GGS) and Western burrowing owl (*Athene cunicularia*) (WBO). The Project will potentially also impact Swainson's hawk and other migratory raptors, their nests and their foraging habitats. Additionally, the Project may adversely impact Central Valley Spring-run Chinook salmon (*Oncorhynchus tshawytscha*).

Any activity resulting in loss of habitat, decreased reproductive success, or other negative effects on population levels of State-listed endangered or threatened species should be addressed. If it is not possible to avoid impacts to special status species, mitigation should be provided which fully mitigates project impacts. Activities resulting in the unavoidable "take" of a state-listed plant or animal species would require the project proponent to obtain a permit from Department pursuant to Section 2081 of the California Fish and Game Code.

The Project provides general avoidance and minimization measures and concludes that with implementation of the measures, the impacts would be reduced to below the level of significance pursuant to CEQA. The Department has concerns about the completeness of the impact analysis with regard to the following issues below.

Giant garter snake and Western burrowing owl

S4-B

Potential Project impacts to GGS and WBO that have not been fully analyzed include activities that will remove, compact, fill, or otherwise impact rodent burrows and the species that may use them. The Project should quantify potential burrow habitat, concrete debris and structures that may provide habitat for these species, and provide measures to avoid and minimize the impacts and provide permanent mitigation for permanent impacts to these habitats.

The cumulative impacts of loss of burrow habitat from the Project also need to be analyzed in conjunction with other near foreseeable projects in the vicinity, and ongoing maintenance in the area to address cumulative impacts.

The DEIS/EIR concludes that construction activities will directly impact rodent burrows during earth moving activities, however, the analysis fails to discuss or analyze the

impact of the practice of grouting of rodent burrows and the impact of this on GGS or WBO. If this measure will be used in advance of the Project or as part of the Project maintenance, the Department advises that the direct, indirect and cumulative impacts of grouting be addressed in the DEIS/EIR. The impact to sensitive species from grouting is potentially significant and measures to avoid, minimize and mitigate the impacts to GGS and WBO should be included in the analysis.

S4-B cont'd

Grouting rodent burrows, if included in long-term maintenance of the Project may result in a significant permanent loss of rodent burrows that provide wintering refugia for GGS and WBO. Burrows also provide habitat necessary for essential biological functions outside the winter period. Grouting constitutes a permanent hardening of the existing earthen levees which precludes development of future rodent activity or replacement burrow habitat for GGS and WBO. The DEIS/EIR should provide a discussion of this along with an analysis of permanent habitat impacted for the purposes of mitigation for loss of this habitat.

Swainson's hawk and nesting birds

S4-C

The DEIS/EIR provides a set of general avoidance, minimization and mitigation measures to protect Swainson's hawk and other nesting birds. The measures suggested do not include avoidance of active nest sites during the breeding season by employing an enforceable construction activity buffer distance from the nest(s). The Department recommends that an avoidance measure be added for each bird species that may potentially be directly or indirectly impacted by the Project. The avoidance buffer may be different depending on the species but should be added to the measures to avoid take of the species. It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird (FGC § 3503).

Staging, Spoils and Borrow sites

S4-D

The DEIS/EIR discloses that the estimated impacts to habitat do not include a complete analysis of all potential sites where construction equipment, soil, rock or other materials will be staged for the Project. The document notes a number of storage sites where materials may be deposited or stored, however, also notes that additional sites may be identified in the future upon implementation of the Project. The direct and indirect impacts associated with storage and spoils sites must be identified, analyzed and disclosed as part of the Project as these sites may contribute to impacts to habitats and species and may require additional mitigation.

Riparian Habitat

S4-E

Riparian habitat is an extremely important vegetation community in California and it is estimated that less than 10 percent remains of the historical acreage. More than 90 species of mammals, reptiles, invertebrates and amphibians such as California red-legged frog (*Rana draytonii*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) and riparian brush rabbit (*Sylvilagus bachmani riparius*) depend on California's riparian habitats. Over 135 species of California birds such as the willow flycatcher (*Empidonax traillii*), western yellow-billed cuckoo (*Coccyzus americanus*

S4-E cont'd

occidentalis) and red-shouldered hawk (*Buteo lineatus*) either use riparian habitats preferentially at some stage of their life history or are completely dependant upon them. This habitat provides food, nesting habitat, cover, and migration corridors for hundreds of different species. In addition to its significance for biological resources, riparian habitat also provides riverbank protection, erosion control and improved water quality.

S4-F

The DEIS/EIR discloses that the Project intends to comply with the April 2009 Corps General Technical Letter (ETL) 1110-2-571, which set forth guidelines for vegetation management on levees, floodwalls, embankment dams and appurtenant structures for the control of vegetation on levees. The guidelines recommend that a vegetation-free zone be established on all of these structures.

The 2009 Corps guidelines advise that the vegetation free zone be at least the width of the levee, including all critical appurtenant structures, plus 15 feet on each side, measured from the outer edge of the outermost critical structure. In the case of a landside planting berm, the 15 feet is measured from the point at which the top surface of the planting berm meets the levee section. The guidelines recommend that the vegetation free zone should be limited, in general, to approved grasses.

S4-G

In light of the Project anticipating application of the 2009 Corps vegetation free zone, there will be a significant removal of riparian vegetation throughout the Project corridor. The DEIS/EIR fails to provide sufficient information regarding the impacts to riparian habitats or adequate measures to reduce, minimize or mitigate these impacts to reduce them to below the level of significance pursuant to CEQA. The DEIS/EIR analysis does estimate that there are approximately 241 acres of riparian forest and 22 acres of riparian scrub-shrub habitat within the Project area. In addition to these estimates an additional 12 acres of riparian forest is identified in association with jurisdictional wetlands. For this analysis to be complete, it should include a comprehensive quantification of direct and indirect impacts, and temporary and permanent impacts for all riparian habitat, riparian trees, shaded riverine aquatic habitat, and riparian wetlands that will be affected by the Project. All riparian trees that will be removed, that are greater than four inches in diameter at breast height, should also be identified by species.

S4-H

A riparian restoration plan should be prepared that includes how and where the riparian impacts will be restored, mitigated, and monitored. If restoration will be the primary mitigation for the impacts then complete monitoring details should also be developed and should include specific success criteria for riparian restoration plantings, funding assurances for the cost of planting and monitoring, and the process for replanting to achieve an identified target survival of trees, species of trees, and percentage of tree canopy. Restoration shall occur on property that will be protected in perpetuity and managed for riparian habitat.

S4-I

Proposed mitigation proposals shall be consistent with the Department's "Policy for Mitigation on Publicly Owned, Department Owned and Conservation Lands" (attached Departmental Bulletin #2012-02). If mitigation is proposed on Department lands, any cost associated with updating management plans, CEQA compliance and management activities shall be provided to the Department.

S4-I cont'd Notification to the Department may be required, pursuant to FGC §1600 et seq. if the project proposes to: divert, obstruct, or change the natural flow or the bed, channel or bank of any river, stream, or lake; use material from a streambed; or result in the disposal or deposition of debris, waste, or other material where it may pass into any river stream, or lake.

Recreation on Department Lands

S4-J The DEIS/EIR notes that nine separate wildlife management units from the Oroville and Feather River Wildlife Areas have the potential to be impacted by this project. Portions of these lands are slated to be closed during construction. For areas remaining partially open, the document suggests that traffic and project noise may create disturbances to users. The levee system is a primary route of transportation for those enjoying these wildlife areas. Special hunts in delineated fields are just some of the many site-specific recreation activities provided by the Department annually. The proximity of seemingly similar habitat does not insure a similar recreation experience. The DEIS/EIR should provide a discussion of the disproportionally high recreational use on and near the levee and include analysis of the loss of opportunity to areas having site-specific importance.

Cumulative Impact Analysis

S4-K The DEIS/EIR generally discusses potential near foreseeable projects, however, the discussion is limited and fails to capture the potentially significant impacts of the Project relative to other large projects in the area. The Department recommends that the cumulative impact analysis be expanded in particular to include other near foreseeable levee construction and maintenance projects, linear corridor projects proximate to the Project, including but not limited to, transportation and utility projects.

Conclusion

S4-L The Department appreciates the opportunity to provide comments on the Project and we hope you will contact us if you would like to discuss our concerns, comments, and recommendations in greater detail. We also recommend early coordination in the review of the preferred Project analysis and subsequent analysis of impacts to biological resources and to facilitate processing of any Department permits.

If you have any questions, please contact Jenny Marr, Staff Environmental Scientist, 1701 Nimbus Road, Rancho Cordova, CA, 95670, (530) 895-4267 or at Jenny.Marr@wildlife.ca.gov.

Sincerely

Tina Bartlett
Regional Manager

cc's and ec's: Page 6

Ms. Koschak
February 11, 2013
Page 6

cc: Ingrid Norgaard
Sutter Butte Flood Control Agency
c/o ICF International
630 K Street, Suite 400
Sacramento, CA 95814

U.S. Fish and Wildlife
ATTN: Jason Hanni
2800 Cottage Way, Suite W-2606
Sacramento, CA 95825

ec: Jeff Drongesen
Jenny Marr
Department of Fish and Wildlife

State Clearinghouse

Response to Letter S4

S4-A

California Department of Fish and Wildlife's (CDFW) review and input is appreciated. SBFCA looks forward to working with the CDFW toward completion of this project and future multi-benefit actions in collaboration with CDFW. Comment did not necessitate change to the Final EIS.

S4-B

A discussion of potential effects on burrows that provide habitat for giant garter snake and western burrowing owl has been added to Section 3.9 of the Final EIS. A discussion of the effects of maintenance activities on habitat for these species has also been added to the Final EIS, as well as Mitigation Measure WILD-MM-7 to minimize effects on habitat, including burrows, grouting of burrows if it is employed, and to compensate for this loss through regional habitat conservation plans/natural community conservation plans (HCPs/NCCPs). The project's contribution to the cumulative loss of burrow habitat was added to the cumulative discussion.

S4-C

Mitigation Measures WILD-MM-11 and WILD-MM-13 (formerly Mitigation Measures WILD-MM-7 and WILD-MM-9) both contain language for implementing no-disturbance buffers for active nests. Mitigation Measure WILD-MM-11 states "If active [Swainson's hawk] nests are found, SBFCA will maintain a 0.25-mile buffer or other distance determined appropriate through consultation with CDFW, between construction activities and the active nest(s) until it has been determined that young have fledged." Mitigation Measure WILD-MM-13 states "If active nests are found in the survey area, no-disturbance buffers will be established around the nest sites to avoid disturbance or destruction of the nest site until the end of the breeding season (approximately September 1) or until a qualified wildlife biologist determines that the young have fledged and moved out of the project area (this date varies by species). The extent of the buffers will be determined by the biologists in coordination with USFWS and CDFW and will depend on the level of noise or construction disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species."

S4-D

Potential borrow sites and access routes have been added to the project study area and effects on biological resources in these areas have been accounted for in Sections 3.8, 3.9 and all applicable tables in the Final EIS. All staging areas are expected to be within the construction footprint and have also been accounted for in the project study and effects on biological resources in these areas have been accounted for in Sections 3.8, 3.9 and all applicable tables in the Final EIS.

S4-E

It is agreed and acknowledged that riparian habitat is very valuable and has been subject to substantial loss since the mid-19th century. SBFCA has worked aggressively and iteratively with its engineering and environmental team to maximize avoidance and minimization of effects through adjustment of the construction footprint, use of protective barriers, and changes in construction practices. Beyond the FRWLP, to improving fish and wildlife habitat, the SBFCA Board and the coalition of environmental organizations have agreed to a Memorandum of Understanding that commits to pursuing several identified multi-benefit actions for floodplain restoration and others

that may be identified through the Feather River Regional Flood Management Plan, including riparian enhancements. Constructing the FRWLP is essential as the foundation upon which restoration building blocks can be laid. Comment did not necessitate change to the Final EIS.

S4-F

It should be noted that the project does not propose to apply the USACE levee vegetation policy. Only vegetation within the direct construction footprint of levee work would be removed. The document states this in Chapter 1, on page 1-14, third paragraph.

S4-G

While the project proposes to remove woody vegetation within the direct construction footprint of levee work, it should be noted that the project does not propose to apply the 2009 USACE vegetation-free zone as stated in the comment. SBFCA has worked with its engineering and environmental team to maximize avoidance of effects on woody vegetation through adjustment of the construction footprint, use of protective barriers, and changes in construction practices. Impacts to vegetation and trees are quantified in Chapter 3, Section 3.8, Tables 3.8-6, 3.8-7, and 3.8-8. Comment did not necessitate change to the Final EIS.

S4-H

An MMP including riparian habitat restoration has been drafted per the guidelines noted in the comment (see Appendix F.3). The plan will be finalized based on input from the permitting agencies, including CDFW. In brief, effects on riparian habitat will be mitigated through plantings in the Star Bend floodplain restoration area, supplementing the existing plantings.

S4-I

An MMP has been drafted to be consistent with CDFW's policy referenced in the comment. It is understood that the mitigation action is subject to CDFW authorization, as well as other environmental permits. The authorizations for the FRWLP are intended to provide coverage for mitigation at the Star Bend site. The MMP is included as Appendix F.3.

S4-J

The text in *Effects and Mitigation Measures*, Section 3.14.4, has been revised to acknowledge the unique recreation opportunities provided by the CDFW wildlife areas along the Feather River in the project area. For each affected recreation location (including the individual CDFW Oroville Wildlife Area [OWA] and Fern Ridge Wildlife Area [FRWA] management units), a nearby alternative location for a similar recreation experience is listed.

S4-K

At the request of CDFW, SBFCA contacted TRLIA and PG&E to confirm completeness of reasonably foreseeable actions currently considered in the cumulative effects analysis. TRLIA verified the Agency has no additional projects to consider. PG&E suggested inclusion of the Palermo to East Nicolaus transmission project, which has now been added into the discussion and analysis in Chapter 4. The Sutter Basin Feasibility Study is effectively analyzing the same action and would result in effects to be cumulatively considered.

S4-L

Understood; SBFCA looks forward to coordinating with CDFW for this project and future actions. Comment did not necessitate change to the Final EIS.

Letter S5—California State Lands Commission, Division of Environmental Planning and Management, Cy R. Oggins, Chief, February 11, 2013

Letter S5

STATE OF CALIFORNIA — EDMUND G. BROWN JR., *Governor*

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February 11, 2013

File Ref: SCH #2011052062

Mike Inamine
Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

Subject: Draft Joint Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR) for the Feather River West Bank Levee Project, Sutter and Butte Counties

Dear Mr. Inamine:

The California State Lands Commission (CSLC) staff has reviewed the subject DEIS/DEIR for the Feather River West Bank Levee Project (Project), which is being prepared by the Sutter Butte Flood Control Agency (SBFCA), and the Army Corps of Engineers (USACE). The SBFCA, as a public agency proposing to implement the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The USACE, as a federal agency with oversight and authorization authority over federal project levees, is the lead agency under the National Environmental Policy Act (NEPA) (42 USC §4321 et seq.). The CSLC is a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.

CSLC Jurisdiction and Public Trust Lands

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways (Pub. Resources Code, §§6301, 6216). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On navigable non-tidal waterways, including lakes and

rivers, the State holds fee ownership of the bed of the waterway between the ordinary low water marks and a Public Trust easement between the ordinary high water marks and ordinary low water marks. On waterways that have been artificially manipulated due to fill, avulsion or artificial accretion, or where the boundary has been fixed by an agreement or court, sovereign land and the public trust easement may not be readily apparent from present day site inspections.

The Feather River is a non-tidal, navigable river in which the State owns the bed of the river from its mouth with the Sacramento River to above Oroville, within the entire Project area. Due to past construction of levees, gravel and sand extraction, channelization, and the upstream dam, CSLC staff does not have sufficient information to determine whether the Project will intrude upon State-owned sovereign lands, at this point. Conducting a boundary determination for the 41-mile length of the Project would be expensive and time-consuming. CSLC staff does not believe such an expenditure of time, effort and money is warranted in this situation, given the limited resources of the agency and the circumstances set forth above. This conclusion is based on the location, characteristics, historic evidence, and circumstances of the river channel and the proposed Project. Therefore, the CSLC staff has concluded that it is presently undetermined whether the location of the proposed Project will intrude upon lands under the jurisdiction of the CSLC and will not require a lease. This determination is not intended, nor should it be construed as, a waiver or limitation of any right, title, or interest of the State of California in any lands under its jurisdiction. While the CSLC is not requiring a lease at this time, it is providing comments on the DEIS/DEIR as a trustee agency, as described in the introductory paragraph.

Project Description

The SBFCA and the USACE propose to construct improvements to the Feather River West Bank Levee to meet the SBFCA's objectives and needs as follows:

- Reduce flood risk from the Feather River toward a target of 200-year-flood protection for urbanized areas and 100-year-flood protection for more rural or agricultural areas;
- Protect existing populations and minimize exposure to flooding for agricultural commodities, infrastructure use, and other property;
- Address known levee deficiencies and observed performance issues, such as through-seepage, under-seepage, embankment instability, erosion, and encroachments;
- Construct the Project as soon as possible to reduce flood risk quickly and facilitate compatibility with recreation and restoration goals in the planning area.

The Project area is focused on a corridor along the west levee of the Feather River that is approximately 41 miles long. The north end of the Project area is at Thermalito Afterbay and the south end of the Project area is roughly 4 miles north of Sutter Bypass. This corridor is roughly 500 feet toward the land side of the existing levees and 100 feet toward the water side. The Project area also contains some borrow and spoil sites or mitigation sites outside of the levee construction corridor for specific alternatives.

From the Project Description, CSLC staff understands that the Project would include the following components, which are combined to create the alternatives considered in the Project:

- Slurry cutoff walls
- Slope flattening
- Stability berms
- Levee reconstruction
- Sheet-pile walls
- Seepage berms
- Relief wells
- Depression/ditch infilling
- Clay ditch lining
- Limited encroachment removal
- Canal seepage treatment

The DEIS/DEIR also describes the following alternatives.

- Alternative 1 focuses on the measures that would remain within the existing levee footprint. Alternative 1 minimizes real estate acquisition and changes in land use; this alternative primarily uses cutoff walls to address levee deficiencies.
- Alternative 2 uses measures that would not be constrained by the existing footprint of the levee. Alternative 2 may address levee deficiencies with greater effectiveness and less cost than Alternative 1. Alternative 2 uses stability berms and seepage berms that would extend well beyond the existing levee footprint.
- Alternative 3 is a combination of the flood management measures identified in Alternatives 1 and 2. The combination of measures used in Alternative 3 were determined by considering their effectiveness in addressing levee deficiencies, compatibility with land use, minimization of real estate acquisition, avoidance of environmental effects, cost and the current levee footprint. Alternative 3 proposes a combination of cutoff walls and berms, along with other measures, to address levee deficiencies.

The DEIS/DEIR identifies Alternative 3, which balances the need to import construction materials, construction emissions, real estate acquisition, land use change, habitat effects, and construction-related disturbance, as the Environmentally Superior Alternative.

Environmental Review

CSLC staff requests that the SBFCA consider the following comments on the subject DEIS/DEIR.

S5-A

1. **Water Quality and Groundwater Resources**: Mercury/Methylmercury. The DEIS/DEIR should consider the Project's impacts on the movement of mercury and methylmercury in the Feather River. The DEIS/DEIR considers the Project's impacts on turbidity in the Feather River, but does not consider the link between turbidity and mercury transport. Since mercury and methylmercury are associated with small particulates, some Project construction activities may contribute to mercury transport in the Feather River.

S5-A cont'd

On April 22, 2010, the Central Valley Regional Water Quality Control Board (RWQCB) identified the CSLC as both a State agency that manages open water areas in the Sacramento-San Joaquin Delta Estuary and a nonpoint source discharger of methylmercury (Resolution No. R5-2010-0043), because subsurface lands under the CSLC's jurisdiction are impacted by mercury from legacy mining activities dating back to California's Gold Rush. Pursuant to a RWQCB Total Maximum Daily Load (TMDL), the CSLC, Department of Water Resources, and Central Valley Flood Protection Board are required to reduce methylmercury concentrations in the Delta and open waters under jurisdiction of the CSLC. Consequently, any action taken that may result in continued mercury and methylmercury moving from upstream areas to the Sacramento-San Joaquin Delta Estuary may affect the CSLC's efforts to comply with the RWQCB TMDL.

Although the impact of excessive turbidity (effect WQ-1), was found to be less than significant, the DEIS/DEIR should assess the impacts of mercury on water quality. The assessment should include an estimate of the amount of mercury that may be mobilized by the Project activities, if feasible. If mercury mobilization and transport are expected, the DEIS/DEIR should determine if mercury transport will rise to the level of a significant impact to water quality in the Feather River and downstream.

S5-B

2. **Traffic, Transportation and Navigation**: Navigation. The Feather River is considered by the State to be navigable to above Oroville. In addition, the River for the entire Project area is subject to the public navigation servitude. This means that members of the public have the right to navigate and exercise the incidences of navigation in a lawful manner on waters within the State, whether publicly or privately owned, that are capable of being physically navigated by oar or motor-propelled small craft. Such uses may include, but not be limited to, boating, rafting, sailing, rowing, fishing, fowling, bathing, skiing, and other water-related public uses. The SBFCA must ensure that the Project does not restrict or unduly impede this right of the public. The use of two barges to place material on the waterside slope of the West levee may reduce the navigability of the Feather River. CSLC staff requests that the SBFCA identify and use best management practices to maintain navigability during the Project.

S5-C

3. **Fish and Aquatic Resources**: Aquatic Invasive Species. The DEIS/DEIR should consider the project's impacts on the spread of aquatic invasive species. The DEIS/DEIR states that a barge or tow-boat with a crane may be used to place riprap on the banks of the Feather River. These vessels may act as a vector for aquatic invasive species to become established in the Feather River. One of the major stressors to the Sacramento-San Joaquin River delta is the introduction of non-native species. If the vessels used for construction arrive from the Sacramento River, they may bring established aquatic invasive species from downstream areas. The DEIS/DEIR should provide a range of alternatives for prevention programs for aquatic invasive species, including quarantine, early detection, and early response.

S5-D

4. **Recreation**: Public Access. In section1.6.3.5, the DEIS/DEIR identifies the demand for increased public access to the Feather River corridor as an area of controversy, especially public access across and upon the levees in the Project area. However

S5-D cont'd

the DEIS/DEIR does not address this controversy. The California Constitution adopted in 1879 provides in Article X, section 4:

> No individual, partnership, or corporation, claiming or possessing the frontage of tidal land of a harbor, bay, inlet, estuary, or other navigable water in this State, shall be permitted to exclude the right of way to such water whenever it is required for any public purpose, nor to destroy or obstruct the free navigation of such water; and the Legislature shall enact such laws as will give the most liberal construction to this provision, so that access to navigable waters of this State shall always be attainable for the people thereof."

Currently, there are virtually no dedicated access points for the public to reach the river between Yuba City and the Sacramento River at Verona. The SFBCA should consider the mandate in the Constitution and develop reasonable access to the river in conjunction with the flood control goals.

S5-E

5. **Cultural Resources**: Title to Cultural Resources. The DEIS/DEIR should mention that the title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC. CSLC staff requests that the SBFCA consult with Senior Staff Counsel Pam Griggs, at the contact information noted at the end of this letter, should any cultural resources on state lands be discovered during Project construction.

Thank you for the opportunity to comment on the DEIS/DEIR for the Project. As a trustee agency, we request that you consider our comments prior to adoption of the DEIS/DEIR. Please send copies of future Project-related documents, including electronic copies of the Final EIS/EIR, Mitigation Monitoring and Reporting Program (MMRP), Notice of Determination (NOD), CEQA Findings and, if applicable, Statement of Overriding Considerations when they become available, and refer questions concerning environmental review to Holly Wyer, Environmental Scientist, at (916) 574-2399 or via e-mail at Holly.Wyer@slc.ca.gov. For questions concerning archaeological or historic resources under CSLC jurisdiction, please contact Senior Staff Counsel Pam Griggs at (916) 574-1854 or via email at Pamela.Griggs@slc.ca.gov. For questions concerning CSLC leasing jurisdiction, please contact Mary Hays, Public Land Manager, at (916) 574-1812, or via email at Mary.Hays@slc.ca.gov.

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
Curtis Fossum, LEGAL, CSLC
Mary Hays, LMD, CSLC
Holly Wyer, DEPM, CSLC

Response to Letter S5

S5-A

USACE agrees that mercury should have been addressed in the effect analysis, but a numeric estimation of the potential increase in the mercury concentration downstream is not needed. Because of environmental commitments 2.4.12 (SWPPP) and 2.4.15 (Turbidity Monitoring Plan), it is anticipated that the project will not increase mercury concentration due to suspended sediments and turbidity.

Text was added to the document on page 3.2-16 discussing the relationship between sediments and mercury. Text added: "In addition, suspended sediment has also been known to aid in the transport of absorbed nutrients, organic contaminants and metals such as mercury. The fraction of the metal absorbed is a constant, called the 'partition' coefficient. Some metals are mostly absorbed and some are mostly dissolved. For example, mercury in its dissolved state is called methylmercury and methylmercury would not change in the river from increased transport of suspended sediments, but total mercury could be disturbed and transported downstream from construction related disturbed sediments. Total mercury is an example of a metal that is very absorbed, so the concentration in the suspended sediment (as indicated by turbidity measurements) will be similar to the concentration of turbidity if total mercury is present in the disturbed soils where construction is taking place. Because construction does not involve any in-water construction, it is anticipated that sediments in the river will not be disturbed. In addition, environmental commitment 2.4.12 SWPPP will ensure that best management practices (BMPs) catch any construction related sediments prior to entering the river. Environmental Commitment 2.4.15 (Turbidity Monitoring Plan) will ensure performance of environmental commitment 2.4.12 (SWPPP)."

S5-B

The comment highlights an error in the document. The text regarding use of barges in the river had previously applied to a proposed element for work on the waterside levee slope that is no longer part of the project. Reference to use of barges is a legacy of that former element and no longer is proposed. The referenced text has been deleted from the Final EIS.

S5-C

The comment highlights an error in the document. The text regarding use of barges in the river had previously applied to a proposed element for work on the waterside levee slope that is no longer part of the project. Reference to use of barges is a legacy of that former element and no longer is proposed. The referenced text has been deleted from the Final EIS. The project has taken all feasible measure to prevent invasive plants from colonizing aquatic sites, as described in Section 2.4.7.

S5-D

Generally, it is agreed that the public has the right to use of the river and that the Feather River is navigable by small, recreational craft. It is further acknowledged that there are limitations to access, including locked gates, lack of signage, lack of developed put-in/take-out points for non-motorized craft, and lack of parking and other amenities. It is acknowledged that there are public lands in the river corridor, including those controlled by the State of California, that are not accessible for public use. However, SBFCA does not have responsibility to address these issues as part of its proposed project focused on flood risk-reduction measures to address documented levee deficiencies

according to Federal and state criteria. The fundamental analytical premise under NEPA and CEQA is to assess the change that would occur as a result of the project. SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. From the larger perspective of SBFCA's overall approach toward recreation and public access to the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt a Memorandum of Understanding that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study. In regard to the specific cite from the constitution, it has been added to the Final EIS under Section 3.14.2.1, *Regulatory Setting*, applying language from both the U.S. and California constitutions, but it should be noted that SBFCA has no general or specific mandate to develop access. Moreover, the project is neutral in that it does not change permanent public access.

S5-E

Comment noted. The text of the relevant chapter has been revised on page 3.17-5.

Chapter 3
Other Organizations and Entities Comments and Responses

This chapter contains the comments received on the Draft EIS/EIR from non-governmental organizations. Each comment letter has been assigned a unique code. Each comment within the letter has also been assigned a unique code, noted in the margin. For example, the code "O1-A" indicates the first distinct comment (indicated by the "A") in the letter from Pacific Gas and Electric Company, which was the first letter (indicated by the "1") received from an organization (indicated by the "O"). The chapter presents each comment letter immediately followed by the responses to that letter. Table 3-1 summarizes the commenting party, comment letter signatory, and date of the comment letters.

Table 3-1. Other Organization and Entity Comment Letters

Letter	Agency	Comment Letter Signatory, Date
O1	Pacific Gas and Electric Company	Lonn Maier, Supervisor, February 13, 2013
O2	American Rivers Trust, et al.	John Cain, et al., February 13, 2013
O3	American Rivers Trust, et al.	John Cain, et al., February 15, 2013
O4	American Rivers Trust, et al.	John Cain, et al., March 15, 2013
O5	Natural Resources Defense Council and The Bay Institute	Monty Schmitt and Gary Bobker, March 14, 2013
O6	Patrick Porgans & Associates	Patrick Porgans, February 26, 2013

Letter O1—Pacific Gas and Electric Company, Lonn Maier, Supervisor, February 13, 2013

Letter O1

Pacific Gas and Electric Company
WE DELIVER ENERGY.

Lonn Maier
Supervisor
Electric Transmission Environmental
Planning & Permitting

2730 Gateway Oaks Drive
Sacramento, CA 95833
Office: (916) 923-7020
Cell: (916) 704-4370
Fax: (916) 923-7044
E-mail: lcmk@pge.com

February 12, 2013

Mr. Jeff Koschak
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

Re: Pacific Gas and Electric Company Comments on the Sutter Butte Flood Control Agency Feather River West Levee Draft Environmental Impact Report/Environmental Impact Statement

Dear Mr. Koschak:

Thank you for the opportunity to comment on the Feather River West Levee (FRWL) draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS). I am writing to provide you with comments, clarification, and additional information concerning the proposed Pacific Gas & Electric (PG&E) work described in the draft EIR/EIS.

O1-A As indicated in the EIR/EIS, approval of this project will result in the need for PG&E to relocate electric and gas facilities. To assist the Sutter Butte Flood Control Agency (SBFCA) in complying with the California Environmental Quality Act (CEQA) and the U.S. Army Corps of Engineers (Corps) in complying with the National Environmental Protection Act (NEPA)—both of which require the lead agency to fully describe all proposed activities associated with a project—PG&E is providing additional details concerning the natural gas and electrical facilities and related construction activities in the FRWL project footprint. PG&E requests that the information provided be included in the final EIR/EIS and added to the project's administrative record.

O1-B A primary concern PG&E has in reviewing the draft EIR/EIS is that the project area does not appear to include all of the locations where PG&E facilities will need to be relocated to and, consequently, where construction activities and potential impacts may occur. PG&E requests that the information provided below be included in the EIR/EIS so that all of PG&E's relocation and construction activities will be fully described in the final EIR/EIS and included in the SBFCA environmental permits to support the relocation of PG&E facilities. PG&E further requests that existing and relocated PG&E facilities are included in the project regulatory and environmental setting analyzed for each resource area in the final EIR/EIS, and that all findings be documented in the effects discussion for each applicable resource area.

In addition to these concerns, PG&E has provided specific comments to the draft EIR/EIS below.

Comments Specific to the Draft EIR/EIS

O1-C

1. Table 1-5. Key Infrastructure and Facilities in SBFCA's Planning Area – Page 1-18
   a. Under the heading Energy Companies, please add PG&E.

O1-D

2. Section 2.3.1 Project Footprint and Land Acquisition – Page 2-17 and Appendix G
   a. The draft EIR/EIS states that "SBFCA with DWR would attempt to acquire land rights 30 feet on the landside ..." PG&E is presently being asked to relocate some facilities 100 feet *or more* from the toe of the levee, which would require additional land rights. In addition, because not all PG&E locations have been identified as of the date of this comment letter, the need for broader land rights should be assumed. This comment also pertains to Appendix G and the description of the facilities to be relocated.

O1-E

3. Section 2.3.2 and Table 2-5 Relocations, Demolition, and Removals - Page 2-18 -2-20
   a. Please include Electrical Transmission and Distribution facilities in the list of description of activities on page 2-18.

O1-F

   b. Line 7 of Table 2-5 identifies a PG&E 12-inch Gas Line as a pipe crossing replacement, but no other PG&E facilities are identified for relocation, demolition or removal in this table. In Phase C alone, PG&E has identified over 125 poles and multiple gas lines that need to be relocated. Table 2-5 should be either include all PG&E facilities or it should be deleted; the text provided at the bottom of the table on page 2-20, if revised as requested below, accurately discusses these activities in a more general fashion.

O1-G

4. Section 2.3.2 Relocations, Demolition, and Removals - Page 2-20
   a. Suggested revisions to text following Table 2-5.

   "Additionally, prior to and/or concurrent with levee rehabilitation construction, PG&E will relocate existing electric transmission and distribution lines and gas transmission and distribution pipelines as requested by SBFCA to facilitate levee rehabilitation construction. Work to be performed by PG&E will include (but not necessarily be limited to) removal of existing and installation of new utility poles and anchors, transfer of existing electric transmission and distribution lines from existing utility poles to new utility poles, removal of existing and installation of new gas transmission and distribution pipelines, and connection of new gas distribution pipelines to existing facilities. Temporary and/or permanent easements required for the construction and maintenance of these facilities are being acquired by SBFCA. The locations of the facilities to be relocated by PG&E, as identified by SBFCA, are shown on Plate 2-3 and identified in Appendix G."

O1-H

   b. PG&E requests that the final EIR/EIS provide a more detailed description of the proposed relocation activities of PG&E facilities by including the attached PG&E Project Description for these efforts (See Attachment A).

O1-I

5. Section 2.4.12 Storm Water Pollution Prevention Plan – Page 2-35
   a. Please include the following BMP:

   "Offsite Tracking. Install rumble plates and crushed rock at project site entrance and exit locations to control offsite tracking of mud from construction vehicle tires."

O1-J

6. Section 3.8 Vegetation and Wetlands – Page 3.8-25
   a. Will the requirement to conduct protocol surveys in suitable habitat for special-status plant species require PG&E to wait until a specific bloom period for plant (and associated survey) has

O1-J cont'd

occurred before conducting work in the applicable areas? If so, the impact to PG&E construction schedules will need to be considered in the broader planning efforts in support of construction timing. If not, this fact should be clarified or the requirement deleted.

7. Section 3.8 Vegetation and Wetlands – Page 3.3-80
   a. The last paragraph of this chapter discusses impacts to oak woodlands. SB 1334 is not discussed in the Compliance Chapter of the draft EIR/EIS. SB 1334 requires that CEQA be applied to a proposed project should there be a possibility for significant impacts on oak woodlands. PG&E requests that, if oak woodlands occur within the project site, an assessment or discussion on this requirement be included in the document.

O1-K

8. Section 3.9 Wildlife
   a. PG&E requests that the following language be included in the draft EIR/EIS:

"Once the precise PG&E facility relocation sites are known, all areas of proposed ground disturbance will be screened to determine if they fall within areas previously surveyed for the presence of regulated biological resources (i.e. special-status species, protected habitat, and waters of the U.S., etc.) in support of the EIR/EIS. In the event areas proposed for ground disturbance fall outside of areas previously surveyed for the presence of regulated biological resources, a site-specific review will be required to ensure that potential impacts to regulated biological resources are avoided to the extent possible or appropriate measures are taken if avoidance is not possible. This review will consist of one of the following: a desk-top biological constraints report and/or a focused field study and associated report of findings, which determines the potential for occurrence of regulated biological resources associated with these areas. Additionally, reports will define site specific avoidance and minimization measures to avoid or reduce potential impacts to regulated biological resources as applicable. The precise method of review for each facility relocation will be decided in consultation with a PG&E Biologist and/or EFS Specialist."

O1-L

   b. Mitigation Measure WILD MM-4: Avoid and Minimize Effects on Giant Garter Snake: This measure reduces the project work window to May-October for much, if not all of the project site. Utility relocation involving, most commonly, the removal and replacement of wood poles at discrete locations, should be allowed outside of this work window. With a pre-construction survey for GGS and guidance and/or monitoring by a qualified biologist, there is minimal risk to the GGS. Table 3.8.1 states there is a total of 59.2 acres of open water in the project area which encompasses roughly 3,000 acres. No riceland habitat is mapped in the project area. Although there may be hydrologic connections to GGS occurrences documented in the CNDDB, it has not been determined if agricultural ditches within the project area have any primary constituent elements to sustain the GGS. For this reason, a general GGS minimization measure dictating the construction work window is not appropriate here. Moreover, if the blanket restriction is retained, PG&E's schedule will be impacted and project delays, possibly substantial delays, may result.

O1-M

O1-N

9. Table 3.9-6 Timing of Mitigation Requirements – Page 3.9-42
   a. This measure to mitigate for impacts to nesting birds requires that vegetation trimming/removal will be conducted September through January 1. PG&E construction activities will require vegetation trimming and/or removal outside of this work window.

O1-O

10. Mitigation Measure WILD MM-5: Compensate for Loss of Suitable Giant Garter Snake Habitat – Page 3-33
    a. This measure states that SBFCA will acquire a fee title or conservation easement for indirect and direct effects to GGS. Alternatively SBFCA will acquire mitigation bank credits or in-lieu fee. If mitigation will be required prior to initiating work, SBFCA needs to be aware that the requirement could delay PG&E's construction schedule. It is PG&E's experience that obtaining fee title on a mitigation site may take an extended period of time.

O1-P

11. Section 3.15.2.1 Regulatory Setting – California Public Utilities Commission – Page 3.15-1
    a. Suggested revisions to the following text:

    "The CPUC regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies in the state. The CPUC is responsible for ensuring that California utility customers have safe, reliable utility service at reasonable rates, protecting utility customers from fraud, and promoting the health of California's economy. The CPUC establishes service standards and safety rules and authorizes utility rate changes, and enforces CEQA compliance for utility construction. The CPUC also regulates the relocation of electrical and gas transmission and distribution lines by public utilities under its jurisdiction, such as those owned by PG&E. The CPUC's General Order (GO) 131-D requires PG&E to obtain a discretionary permit before relocating electrical facilities with voltages greater than 50 kV. PG&E may be able to follow a simpler notice process rather than obtaining a formal permit if (1) the proposed project has undergone CEQA review as part of a larger project and (2) the final CEQA document finds no significant unavoidable environmental impacts as a result of PG&E's construction-related activities. Thus, for the electrical relocation work required for the FRWL project, PG&E may be able to rely on the final EIR/EIS to expedite its permitting requirements under GO 131-D. If a project qualifies for the exemption, GO 131-D requires only a Notice of Construction with an opportunity for public review and comment."

O1-Q

12. Section 3.15.2.1 Utility and Service System Encroachments – Page 3.15-6
    a. First paragraph, last sentence please replace "overhead utilities" with "overhead and underground electric and gas utilities".

O1-R

13. Section 3.15.2.2 Electric Power Transmission and Natural Gas – Page 3.15-4
    a. Please revise the title of this section to read "Electric and Natural Gas Transmission and Distribution".

O1-S

    b. PG&E suggest the following revisions: "Electricity purchased from PG&E by local customers in Sutter and Butte counties is generated and delivered to the counties by a statewide network of power plants and electrical transmission and distribution lines. Natural gas service is provided by PG&E to urbanized areas of Yuba City. In parts of Sutter and Butte counties not served by PG&E's gas transmission and distribution network, including many of the counties' rural areas,

O1-S cont'd

residents and businesses make use of liquid propane gas (LPG) or other tanked or bottled gas for heading and cooking.

O1-T

14. Effect UTL-2: Damage of Public Utility Infrastructure and Disruption of Service – Page 3.15-10
    a. Please correct the second paragraph of this measure, which states that the operation and maintenance area is 20 feet from the landside levee or berm toe. In some instances, PG&E facilities will be located over 100 feet from the levee or berm toe.

O1-U

15. Section 3.16.2.3 Hazardous Materials – Page 3.16-4
    a. Please include the removal of PG&E facilities in the discussion of potential sources of hazardous materials. PG&E suggests the following language be included in the draft EIR/EIS:

    "The project will involve the removal and replacement of existing wood distribution and power poles and related equipment. Oil and treated wood project storage onsite requires secondary containment, managed storage, and labeling with manifested disposal/recycling processing. Insulators will be stored separately and recovered. The existing treated wood poles will be collected in project-specific containers once removed from the site, and will be disposed of at a licensed Class 1 or a composite-lined portion of a solid waste landfill."

O1-V

16. Section 3.17 Cultural Resources
    a. PG&E requests that the following language be included in the draft EIR/EIS:

    "Once the precise locations of PG&E's facilities are known, all areas of proposed ground disturbance will be screened to determine if they fall within the areas previously surveyed for the presence of cultural resources in support of the EIR/EIS. In the event that there are areas proposed for ground disturbance that fall outside of the EIR/EIS cultural survey area, a site-specific environmental review will be required to ensure that impacts to cultural resources are avoided. The review should consist of one or more of the following: literature review, records search and pedestrian survey. The precise method of review of each facility relocation will be decided in consultation with a PG&E Cultural Resources Specialist."

Summary

O1-W

PG&E wishes to coordinate with SBFCA to ensure that PG&E's facilities, the associated replacement and/or relocation activities, and potential construction-related impacts are adequately described in both the description of the project setting and the project area described in the draft EIR/EIS. PG&E remains committed to working with SBFCA through the life of this project with the aim of providing a seamless process for the relocation of our facilities in advance of the levee repair activities SBFCA will be conducting.

O1-X

PG&E is available to review and comment on specific development details for purposes of protecting its vital utility facilities and easements. If you have any questions regarding the above information or have additional questions please do not hesitate to contact me at (916) 923-7020 or at LCMK@pge.com.

Jeff Koschak, U.S. Army Corps of Engineers
February 12, 2013
Page 6

Sincerely,

Lonn Maier

Lonn Maier, Supervisor
Electric Transmission Environmental Planning and Permitting

Attachment

Cc: Michael Bessette, Sutter Butte Flood Control Agency
Chris Elliott, ICF International
Chris Ellis, Principal, PG&E
Michael Inamine, Sutter Butte Flood Control Agency
Barry O'Regan, Peterson, Brustad, Inc.
Danielle Wilson, Senior Land Planner, PG&E

Letter O1
Attachment 1
O1-Y

Sutter Butte Flood Control Agency
Feather River West Levee Project
Pacific Gas & Electric Project Description
Draft: 02/12/2013

Sutter Butte Flood Control Agency (SBFCA) has requested that Pacific Gas and Electric (PG&E) remove and relocate facilities located within the 30 foot demarcation point of the levee toe located within the footprint of the SBFCA's Feather River West Levee Project (FRWL). PG&E facilities include electrical transmission and distribution poles, and natural gas transmission and distribution pipes, as well as supporting equipment such as guy wires, anchors, conductors, pipeline markers, etc.

Construction Timing: Typically, PG&E's utility relocations will need to occur in advance of SBFCA's construction activities at any given location. Construction sequencing for SBFCA's work will be dynamic throughout SBFCA's project planning and design. Factors determining the construction schedule include:

- Further engineering to clarify and determine efficacy of site-specific measures;
- Availability of funding for FRWL;
- Easement and right-of-way acquisition (by SBFCA);
- Availability of borrow material for the levee improvement activities; and/or
- Environmental clearances based on wildlife presence, lifecycle activity, and location of habitats.

PG&E's construction schedule will be further influenced by utility operation and maintenance constraints, particularly for relocation activities that require taking existing facilities temporarily out of service. Many electric facilities cannot be taken out of service during summer peak demand, and gas facilities may also face similar seasonal constraints.

It is anticipated that SBFCA's construction would be divided into four separate construction phases or contracts -- i.e. A, B, C, and D. Although subject to change, the proposed schedule is as follows:

Contract A – 2014-2015
Contract B – 2014-2015
Contract C – 2013-2014
Contract D – 2014-2015

The attached Figure A is a draft table and map prepared by SBFCA identifying the PG&E facilities in conflict with the proposed FRWL Project. PG&E is working with SBFCA to identify solutions for resolving these conflicts. The placement of gas and electric facilities in or in proximity to levees is presently permitted by existing federal and state regulations. As necessary, geotechnical mitigation measures can be incorporated into construction design to ensure that utility facilities effectively co-exist with flood protection facilities. Relocation of gas and electric facilities away from levees should be considered the exception, not the rule.

PG&E is assuming that all of the PG&E activities will be covered under the final Environmental Impact Report/Environmental Impact Statement and the environmental permits secured for the FRWL Project. This will both avoid unnecessary delays associated with separate environmental review and permitting for any utility relocation and ensure that the lead agencies comply with CEQA and NEPA on all aspects of the FRWL Project. PG&E is aware that not all environmental permits will be secured for the entire project prior to the initiation of construction. Some permits may be secured based on the timing of the proposed construction dates of each contract/phase.

1

Electrical Transmission and Distribution: PG&E proposes to install and remove new electrical transmission and distribution poles. Electrical transmission poles will be approximately 100 feet long and installed in the ground approximately 15 feet deep. Electrical distribution wood poles are approximately 95 feet long, installed in the ground approximately 10 feet deep.

Electrical transmission and distribution pole removal will typically be conducted by a line crew, which typically access each pole site with a line truck and trailer or a boom truck except in those instances when the pole is located on the levee crown; a crane may be used in those instances. Existing poles are typically loosened from the ground with a hydraulic jack, removed from their holes using a crane, line truck or boom truck, and transported from the site on a trailer or boom truck. A backhoe and dump truck typically backfill the hole with native soil from project construction activities (e.g., pole excavations).

On average, removal of vegetation up to 50 feet from the toe of the levee will need to occur to accommodate pole installation activities; this figure may be greater in instances where PG&E installation activities are located further than 30 feet from the toe of the levee.

Electrical pole installation techniques typically include staking the pole location, flagging the work area, implementing BMPs, and excavating with either a hole auger to drill and excavate an approximately 3 feet by 3 feet by no more than 10 feet deep site or a backhoe to trench an approximately 5 feet by 5 feet by no more than 8 feet deep site. A crane may be used to remove and install the electrical transmission poles located on the levee crown. Additional installation techniques typically include installing the pole, backfilling, transferring wire and equipment, removing the old conductor, stringing the new conductor, and properly disposing of the facilities and equipment removed and replaced. The project will involve the removal and replacement of existing wood distribution and power poles and related equipment. Oil and treated wood project storage onsite typically requires site secondary containment, managed storage, and labeling with manifested disposal/recycling processing. Insulators are typically stored separately and recovered. PG&E typically collects the existing treated wood poles in project-specific containers once removed from the site, and disposes of them at a licensed Class 1 or a composite-lined portion of a solid waste landfill.

In some instances depending on existing constraints between electrical transmission and electrical distribution lines, underground conduit installation may be required. Typical installation techniques for these types of act ivies include digging a trench between approximately 20 feet wide and 40 feet wide by 4 feet deep by up to 150 feet long. The trench would typically be aligned in the middle of the new utility corridor.

Natural Gas Transmission and Distribution: PG&E proposes to install gas transmission and distribution steel pipe approximately 16 inches in diameter, ranging in approximately 300 to 600 feet long. The project also typically includes the removal and disposal of existing pipe of varying diameters and length. Other typical types of gas transmission and distribution equipment that may be installed include ETS/CTS meter stations for future pipe monitoring purposes, and pipeline markers (paddle and/or carsonite markers) at angle points and as levee crossing locations.

Gas pipe installation techniques typically include digging a trench approximately 2 feet wide by up to approximately 6 feet deep and up to approximately 600 feet long. PG&E typically requires an approximately 60 foot right of way area (ROW) for gas distribution and transmission projects (approximately 25 feet width of temporary disturbance and approximately 35 feet of permanent disturbance). Clearing and grading operations typically involve preparation of the ROW, including vegetation removal, debris disposal, and land leveling. Installation sites are typically backfilled using sand to create an approximately sized 6 inch insulation zone around the pipe and then typically covered by native soil from the project. In some instances, a crane may be required to place pipe at crossing sites located at the crowns of the levees. Dump trucks are typically utilized to

2

transport sand and soil materials. Spoil piles may be temporarily placed onsite while the installation activities are occurring. Replacing of vegetation within the area of the permanent easement typically has restrictions of trees within 10 feet of the pipeline. The example list of equipment below provides the typical activities associated with each piece of equipment that may be utilized for both electrical and natural gas construction activities.

Hydrostatic testing will typically be performed to test the strength of the new pipeline. The typical PG&E approach to this type of test involves the filling of the pipeline with water pressurized to 1.5 times the operating pressure and held for up to approximately 8 hours. Following testing, the pipe is typically flushed to remove dirt and other debris. Test water intake and discharge will typically be performed in accordance with all regulations and permit requirements. Test water is typically then discharged at a rate or in a manner that minimizes erosion, using an appropriate energy dissipater.

Work Crews: Typical electrical transmission and distribution project work schedules are comprised of an average 9-hour day, at an average of 6 days per week per crew. Typical electrical transmission and distribution installation crews consist of 3 to 5 crew members. For purposes of determining the length of construction for each phase of the project, PG&E typically estimates electrical facility installation activities require approximately 1 day for installation of 2 poles on average.

Typical removal and installation of gas transmission and distribution facilities are comprised of 9-hour days at an average of 6 days per week per crew. Typical gas transmission and distribution installation crews consist of 3 to 5 crew members. For purposes of determining the length of construction for each phase of the project, PG&E estimates gas installation activities will require approximately 2 days for installation of approximately 100 feet of pipe on average. PG&E will utilize crew trucks whenever feasible to minimize the number of vehicles accessing each site to reduce potential vehicle-related impacts.

Work Areas, Access Routes and Vegetation Management: Typical PG&E work areas are approximately 125 feet by 125 feet in diameter and typically located in close proximity to installation activity locations. On average, PG&E will require up to 10 work areas per project phase. PG&E commits to utilizing the work areas identified by SBFCA whenever possible. Typically, PG&E project access is achieved through existing public and private roads.

Removal of vegetation to utilize access roads by PG&E equipment may be required. Replacement of vegetation within the area of the permanent easement associated with gas transmission and distribution facilities typically restricts trees from being located within 10 feet of the pipeline. California Public Utilities Commission General Order 95 requires that vegetation maintenance activities be conducted to ensure significant space exists between the electrical line and vegetation for purposes of providing a safe clearance.

Easement Requirements: PG&E currently owns easements along the entire project route. The proposed realignments will traverse agricultural fields and rural homesteads, as well as span the Feather River. PG&E assumes that relocation of the facilities will require acquisition of easements. PG&E is in the process of reviewing the current easements and negotiating contracts and other property rights with SBFCA for permanent or temporary use.

Equipment: The list below represents the typical types of equipment PG&E anticipates it will need to conduct the electrical and gas transmission and distribution work.

- Aerial lifts – Remove old conductor and install new
- Auger – Excavate holes
- Backhoe – Excavate foundations, spoil removal, backfill
- Boom truck – Erect structures

3

- Concrete mixer truck – Haul concrete
- Crane – Erect structures
- Crew-cab truck/pick-ups – Transport personnel, tools and materials
- Dump truck (up to 10 wheels) – Haul material
- Equipment/tool vans – Tool storage and transportation
- Excavators - excavate trench and tie-in holes
- Grooming/grading equipment – Road construction and crane pads:
    - Dozer – Move/compact soils
    - Grader – Properly pitch road for run-off
    - Rock transport – Deliver road base for access roads, staging areas, and pull sites
    - Roller – Compact road and surfaces
    - Water truck – Deliver water for hydro tests and fire control, compact soils, and control dust
    - Low drill – Erect structures
- Helicopters (light and heavy duty) – Erect poles, install sock line, haul materials, equipment and people
- Hydraulic jack – Remove poles
- Line truck and trailer – Haul conductor, poles, equipment, materials, and crews
- Materials storage units – Store material/tools
- Mobile offices – Supervision and clerical office space
- Puller – Install conductor
- Reel dolly – Install and move conductor
- Semi-trucks - deliver materials to staging area
- Tensioner – Install conductor
- Vibratory compaction equipment - compact trench line
- Welding trucks - weld sections of pipe together

4

PRELIMINARY

Letter O1
Attachment 2
O1-Z

SUTTER BUTTE FLOOD CONTROL AGENCY
FEATHER RIVER WEST LEVEE PROJECT
PG&E ENCROACHMENTS COORDINATION LIST

PROJECT B (STATION 510+37 TO 845+00)
LEVEE CONSTRUCTION TO BEGIN IN 2014

PROJECT NUMBER	STATION	DESCRIPTION	WORK REQUIRED
B-1	592+50	Overhead power line crossing the levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
B-2	622+79	Service pole for irrigation well located at levee toe.	Service pole shall be removed.
B-3	638+20	Service pole for irrigation well located near levee toe.	Service pole shall be removed.
B-4	649+11	Utility pole located at landside levee toe. Overhead power line crossing the levee.	Utility pole shall be relocated 30' from landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
B-5	655+50	Service pole for irrigation well located near levee toe.	Service pole shall be removed.
B-6	655+65 to 664+00	Utility poles running parallel to levee near landside toe.	Utility poles shall be relocated 30' from levee toe.
B-7	669+20	Service pole for irrigation well located at levee toe.	Service pole shall be removed.
B-8	688+90 to 689+40	Utility poles located at the landside levee toe. Overhead power line crossing the levee.	Utility poles shall be relocated 30' from landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required. Utility poles on waterside of levee are not required to be relocated by the CVFPB.
B-9	749+75 to 762+00	Utility poles running parallel to levee at landside toe.	Utility poles shall be relocated a minimum of 30' from levee toe. The Garden Highway is located at the levee toe. The utility poles shall be relocated to the west side of the Garden Highway.
B-10	750+10	Overhead power line crossing the levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
B-11	750+50	Transmission lines crossing the levee.	For information only. Transmission lines will not be disturbed during construction.

NOTE: The existing utilities shown are based on topographic surveys and review of existing encroachment permits provided for the FRWL Project. Additional utilities may exist that have not been identified by these sources. PG&E shall review the appropriate electrical and gas maps to determine if additional utilities are located within the project area.

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PRELIMINARY

SUTTER BUTTE FLOOD CONTROL AGENCY
FEATHER RIVER WEST LEVEE PROJECT
PG&E ENCROACHMENTS COORDINATION LIST

PROJECT C1 (STATION 1080+00 TO 1623+86)
LEVEE CONSTRUCTION TO BEGIN IN 2013

PROJECT NUMBER	STATION	DESCRIPTION	WORK REQUIRED
C1-1	1080+00	8-inch gas main crossing levee at skewed angle.	Gas main shall be removed or relocated to allow for construction of the levee improvements. The gas mains shall be reconstructed in accordance with the DWR Title 23 requirements. Reconstructed gas main shall cross perpendicularly to the levee.
C1-2	1097+00	Utility pole on waterside of levee in conflict with proposed 48" raw water pipe. Overhead power line crossing levee	Utility pole shall be relocated south to provide area for construction of 48" raw water pipe. Utility pole shall be located a minimum of 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-3	1107+82	Utility pole located in waterside slope near levee crown. Overhead power line crossing levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-4	1126+00 to 1131+30	Utility poles running parallel to levee near landside toe.	Utility poles shall be relocated a minimum of 30' from the levee toe. Live Oak Blvd is in close proximity to the levee. It may be necessary to relocate the utility poles to the west side of Live Oak Blvd.
C1-5	1135+40	16-inch gas main crossing the levee.	Gas main shall be removed or relocated to allow for construction of the levee improvements. The gas main shall be reconstructed in accordance with the DWR Title 23 requirements.
C1-6	1139+25	Utility pole with guy wire in landside levee slope near levee crown. Overhead power line crossing levee.	Utility pole shall be relocated 30' from landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-7	1152+40	Twin 110kV transmission tower at levee toe. Transmission lines crossing the levee.	For Information only. Transmission tower to remain in place. Transmission lines will not be disturbed during levee construction.
C1-8	1170+05	Utility pole located in landside slope near levee crown. Angle point in the overhead power line. Overhead power line crosses the levee and continues north parallel to the landside toe.	Utility pole shall be relocated 30' from landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-9	1174+35	Utility pole located near landside levee toe.	Utility pole shall be relocated 30' from landside levee toe.
C1-10	1179+05 to 1201+25	Utility poles running parallel to levee at landside toe.	Utility poles shall be relocated 30' from landside levee toe.

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C1-11	1195+15	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-12	1222+15	Utility pole located at landside levee toe. Angle point in overhead power line. Overhead power line turns and continues north crossing at a skewed angle to the levee.	Utility pole shall be relocated 30' from landside levee toe.
C1-13	1223+80 to 1227+60	Utility poles running parallel to levee at waterside toe.	Utility poles shall be relocated 1' outside of the waterside construction limit line.
C1-14	1225+90	Utility pole in landside slope at levee crown. Overhead power line crossing levee at skewed angle.	Utility pole shall be relocated 30' from landside levee toe.
C1-15	1266+80	Utility pole in landside slope near levee toe. Overhead power line crossing levee.	Utility pole shall be relocated 30' from landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-16	1293+66	Utility pole located at waterside levee toe. Overhead power line crossing levee.	Utility pole shall be located 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-17	1307+80 to 1339+00	Utility poles running parallel to levee at waterside toe.	Utility poles shall be relocated 1' outside of the waterside construction limit line.
C1-18	1327+00	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-19	1347+40	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-20	1391+96	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-21	1399+28	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-22	1430+00	Substation, transformers, and utility poles located at the waterside slope. Overhead power lines crossing levee.	Substation, transformers, and utility poles shall be protected in place by the levee contractor. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-23	1460+00 to 1471+00	Underground utility line place within crown of levee per PG&E utility maps.	Underground utility shall be relocated a minimum of 30' from the landside levee toe. The top of the Sutter Butte Main Canal is located approximately 50' from the landside levee toe. Two residential structures are located near the landside levee toe, providing approximately 25' between the structure and top of the Sutter Butte Main Canal.
C1-24	1520+25	Utility pole located in landside slope near toe of levee. Overhead power line crossing levee.	Utility pole shall be relocated 30' from landside levee toe. Existing structure is located at the landside levee toe approximately 20' to 30' from the existing overhead power line alignment. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-25	1536+00	Utility pole located at landside levee toe. Overhead power line crossing levee.	Utility pole shall be relocated 30' from landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.

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C1-26	1556+58	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C1-27	1611+40	Two utility poles located at waterside levee toe. Overhead power line crossing levee.	Utility poles shall be located 1' outside of the waterside construction limit line. Residential structures are located near poles. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.

PROJECT C2 (STATION 845+00 TO 1080+00)
LEVEE CONSTRUCTION TO BEGIN IN 2013

PROJECT NUMBER	STATION	DESCRIPTION	WORK REQUIRED
C2-1	881+50	Utility pole at landside toe of levee next to LD1 relief well pump station.	No work required. Utility pole to remain in place.
C2-2	894+22	12 kV underground cable crossing through levee.	The 12kV underground cable shall be removed to allow for construction of the levee improvements. The 12kV cable shall be replaced after levee construction in accordance with the DWR Title 23 requirements.
C2-3	894+22	Utility pole near landside levee toe.	No work required. Utility pole to remain in place.
C2-4	904+50 to 912+94	Gas main running parallel to the levee within 20' of the landside toe.	Gas main to remain in place. Gas main to be analyzed to determine if construction loads will damage pipe.
C2-5	912+94	Gas transmission station located approximately 40' from landside levee toe.	No work required. Gas transmission station to remain in place. Contractor to protect station in place.
C2-6	913+20	Two 12-inch gas lines crossing levee.	Gas mains shall be removed or relocated to allow for construction of the levee improvements. The gas mains shall be reconstructed in accordance with the DWR Title 23 requirements.
C2-7	930+00 to 952+00	Gas main running parallel to the levee at the landside toe.	Gas main to remain in place. Gas main to be analyzed to determine if construction loads will damage pipe.
C2-8	952+10	12 kV underground cable crossing through levee.	No work required. The 12 kV cable shall be protected in place by the contractor.
C2-9	959+00 to 972+00	Utility poles running parallel to levee near landside toe.	Utility poles shall be relocated a minimum of 30' from the levee toe. Second Street is adjacent to the levee toe. The utility poles shall be relocated to the west side of Second Street.
C2-10	971+70	Utility pole in waterside levee slope. Overhead power line crossing levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Overhead power line crossing can remain in place.
C2-11	1003+72	Utility pole in landside levee slope near crown of levee. A streetlight is attached to the utility pole.	No work required. Utility pole to remain in place.
C2-12	1006+07	Utility pole in waterside levee slope near crown of levee. A streetlight is attached to the utility pole.	No work required. Utility pole to remain in place.

C2-13	1006+93	Utility pole and anchor within landside levee slope near crown of levee. Overhead power line crossing the levee.	No work required. Utility pole to remain in place. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C2-14	1008+00 To 1025+00	Utility poles and overhead power line running parallel to LS levee toe.	Utility poles shall be relocated a minimum of 1' outside of the construction limit line. A residential structure is in close proximity to the levee at Station 1012+00.
C2-15	1008+75	Utility pole located in waterside levee slope. Overhead power lines crossing levee.	Utility pole shall be located a minimum of 1' outside of the waterside construction limit line. Special consideration of this location is required due to the close proximity of the levee to the river channel.
C2-16	1019+80 to 1022+10	Utility poles in waterside slope near levee crown. Streetlights are attached to the utility poles.	No work required. Utility poles to remain in place.
C2-17	1025+00	Utility pole with guy wires in waterside levee slope. Overhead power line crossing levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
C2-18	1028+09	Utility pole in waterside slope near levee crown. Streetlight is attached to the utility pole.	No work required. Utility pole to remain in place.
C2-19	1042+50 to 1080+00	Gas main running parallel to the levee at the landside toe.	Gas main to remain in place. Gas main to be analyzed to determine if construction loads will damage pipe.
C2-20	1073+41	12-inch gas main crossing the levee.	The gas main shall be reconstructed to meet current DWR Title 23 requirements.

NOTE: The existing utilities shown are based on topographic surveys and review of existing encroachment permits provided for the FRWL Project. Additional utilities may exist that have not been identified by these sources. PG&E shall review the appropriate electrical and gas maps to determine if additional utilities are located within the project area.

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PRELIMINARY

SUTTER BUTTE FLOOD CONTROL AGENCY
FEATHER RIVER WEST LEVEE PROJECT
ENCROACHMENTS COORDINATION LIST - PROJECT D (STATION 1623+86 TO 2368+00)

PROJECT D1 (STATION 2290+00 TO 2368+00)
LEVEE CONSTRUCTION TO BEGIN IN 2014

PROJECT NUMBER	STATION	DESCRIPTION	WORK REQUIRED
D1-1	2335+70 to 2351+70	Utility poles running parallel to levee within landside slope.	Utility poles shall be relocated 30' from the toe of proposed seepage berm.
D1-2	2353+90	Utility pole located at the waterside levee toe.	Utility pole shall be relocated 1' outside of the waterside construction limit line.
D1-3	2360+15 to 2367+90	Utility poles running parallel to levee at the waterside levee toe or within the levee prism.	Utility poles shall be relocated 1' outside of the waterside construction limit line.

PROJECT D2 (STATION 1813+33 TO 2290+00)
LEVEE CONSTRUCTION TO BEGIN IN 2014

PROJECT NUMBER	STATION	DESCRIPTION	WORK REQUIRED
D2-1	1887+10	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-2	1888+60 to 1895+10	Utility poles running parallel to the levee at the landside toe.	Utility poles shall be relocated 30' from the landside levee toe. Overhead power lines continue parallel to the levee from Station 1895+10 to 1906+60. Poles shall remain in place between Station 1898+20 to 1906+60. A structure is located at Station 1897+00, between the pole to be relocated at Station 1895+10 and the pole to remain at Station 1898+20.
D2-3	1903+96	Guy wire crossing over levee.	Guy wire shall be removed during levee construction.
D2-4	1906+60	Overhead power lines crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-5	1947+33	Utility pole at waterside levee toe. Underground electrical crossing through levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. The underground electrical shall be removed and disposed. Unknown if this service is still required.
D2-6	1957+00	Utility pole located at the waterside levee toe. Overhead power line crossing the levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Overhead power line shall be lowered during levee

D2-7	1957+10	Utility pole located in the levee crown.	Utility pole shall be relocated 30' from the landside levee toe. Facilities served by utility pole are being removed.
D2-8	2006+10 to 2006+50	Utility poles located at landside levee toe.	Utility poles shall be relocated 30' from the landside levee toe. Utility poles serve an irrigation well that will be relocated.
D2-9	2037+15	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-10	2092+20	Overhead power line crossing levee.	Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-11	2138+00	Utility pole located at the landside levee toe. Overhead power line crosses levee to utility pole located at Station 2142+00.	Utility pole shall be relocated 30' from the landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-12	2142+00	Utility pole located at waterside levee toe.	Utility pole shall be relocated 1' outside of the waterside construction limit line.
D2-13	2178+20 to 2185+50	Utility pole at Station 2178+20 located at the waterside levee toe. Overhead power line crosses levee to utility poles located at the landside levee toe. Power lines continue parallel to the levee.	Utility poles on the waterside of the levee shall be relocated 1' outside of the waterside construction limit line. Utility poles on the landside of the levee shall be relocated 30' from the landside levee toe. Existing structures located at the landside levee toe starting at Station 2184+50 conflict with utility pole relocations on the landside of the levee.
D2-14	2216+70	Utility pole located in the waterside slope at the levee crown. Overhead power line crossing the levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-15	2249+00	Utility pole located at the landside levee toe. Overhead power line crossing the levee.	Utility pole shall be relocated 30' from the landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-16	2264+70 to 2268+45	Utility poles running parallel to the levee at the landside toe. Overhead power line crosses levee at Station 2265+50 to utility pole located on waterside of the levee.	Utility poles on landside of the levee shall be relocated 30' from the landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-17	2282+80	Utility pole located near the waterside levee toe adjacent to a structure. Overhead power line crossing the levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D2-18	2286+00 to 2289+60	Utility poles running parallel to the levee at the landside toe.	Utility poles shall be relocated 30' from the landside levee toe.

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PROJECT D3 (STATION 1623+86 TO 1813+33)
LEVEE CONSTRUCTION TO BEGIN IN 2014

PROJECT NUMBER	STATION	DESCRIPTION	WORK REQUIRED
D3-1	1635+50 to 1638+70	Utility poles running parallel to the levee at the waterside levee toe. Overhead power line crossing the levee at Station 1638+70.	Utility poles shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-2	1651+80	Utility pole located in the waterside levee slope. Overhead power line crosses the levee at Station 1653+15.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-3	1654+20	Utility pole located at the landside levee toe.	Utility pole shall be relocated 30' from the landside levee toe.
D3-4	1665+30 to 1674+50	Utility poles running parallel to the levee at the landside levee toe. Overhead power line crossing the levee at Station 1665+30.	Utility poles shall be relocated 30' from the landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-5	1675+96	Utility pole located in the waterside levee slope. Overhead power line crosses the levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-6	1697+95	Utility pole located at the waterside levee toe. Overhead power line crossing the levee.	Utility pole shall be relocated 1' outside of the waterside construction limit line. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-7	1724+90 to 1731+50	Utility poles running parallel to the levee located in the waterside slope or at the waterside levee toe. Overhead power line crossing the levee at Station 1728+30.	Utility poles shall be relocated 1' outside of the waterside construction limit line. Structures located near the waterside levee toe may conflict with the relocation of the utility poles. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-8	1767+45	Utility pole located in landside slope near levee crown. Overhead power lines crossing the levee.	Utility pole shall be relocated 30' from the landside levee toe. Temporary removal, de-energizing, raising, or relocation of the power line to support levee construction required.
D3-9	1782+50	Utility pole located at landside levee toe.	Utility pole shall be relocated 30' from the landside levee toe.

NOTE: The existing utilities shown are based on topographic surveys and review of existing encroachment permits provided for the FRWL Project. Additional utilities may exist that have not been identified by these sources. PG&E shall review the appropriate electrical and gas maps to determine if additional utilities are located within the project area.

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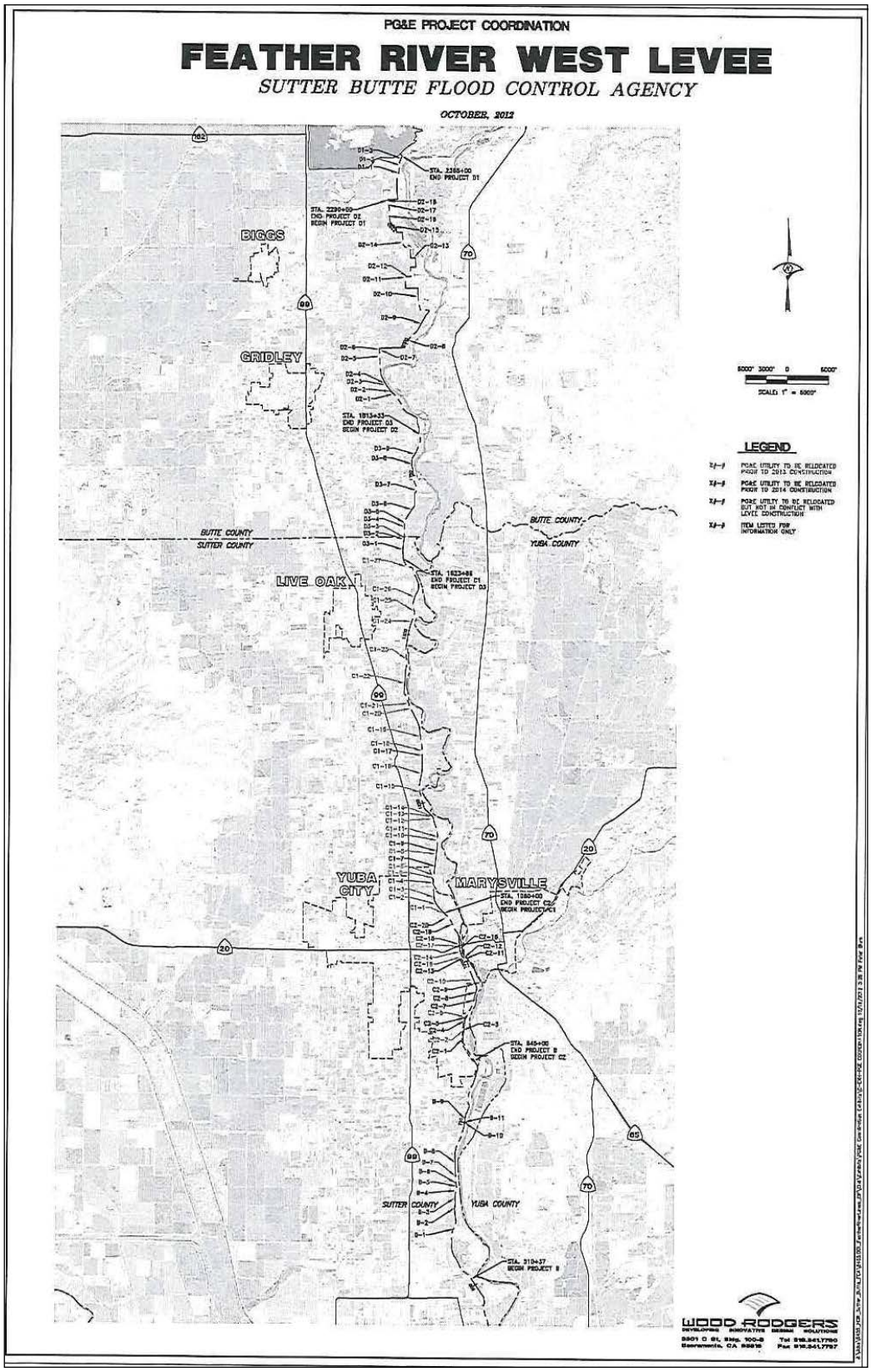
PG&E PROJECT COORDINATION
FEATHER RIVER WEST LEVEE
SUTTER BUTTE FLOOD CONTROL AGENCY
OCTOBER, 2012
BIGGS
GRIDLEY
LIVE OAK
YUBA CITY
MARYSVILLE
BUTTE COUNTY
SUTTER COUNTY
BUTTE COUNTY
YUBA COUNTY
SUTTER COUNTY
YUBA COUNTY
LEGEND
SCALE 1" = 6000'
WOOD RODGERS

Response to Letter O1

O1-A

The additional detail provided by The Pacific Gas and Electric Company (PG&E) has been incorporated into Section 2.3.2, *Relocations, Demolition, and Removals*, as requested and has become part of the project's administrative record.

O1-B

The additional detail provided by PG&E has been incorporated into Section 2.3.2, *Relocations, Demolition, and Removals*, as requested and has become part of the project's administrative record. Discussion of PG&E activities has also been added to relevant resource chapters including *Visual*, *Cultural*, *Vegetation and Wetlands*, and *Wildlife*.

O1-C

PG&E added to Table 1-5.

O1-D

Comment noted. Text added to further describe PG&E's relocation activities including the potential need for broader land rights in Section 2.3.3.

O1-E

Comment noted. As a result of the number of relocations, the current list of PG&E encroachments to be addressed has been added to Appendix G and is referenced in the expanded text in Section 2.3.2.

O1-F

As a result of the number of relocations, the current list of PG&E encroachments to be addressed has been be added to Appendix G and is referenced in the expanded text in Section 2.3.2. Text has been added to more thoroughly describe PG&E's activities as requested.

O1-G

Text added to Section 2.3.3 as requested.

O1-H

Text added to more thoroughly describe PG&E's activities in Section 2.3.3 as requested.

O1-I

The best management practice (BMP) added as requested in Section 2.4.12.

O1-J

Yes, appropriately-timed floristic surveys would be required in areas where PG&E facilities are located in land cover types that represent potential special-status plant habitat such as oak woodlands, ruderal areas outside the toe of the levee, ponds, streams, perennially inundated

canals/ditches that are vegetated, and riparian forest wetlands. Comment did not necessitate change to the Final EIS.

O1-K

Text describing Section 21083.4 of the California Public Resources Code has been added to the Regulatory Setting section of the *Vegetation and Wetlands* chapter.

O1-L

Discussion of the potential effects on wildlife as a result of proposed PG&E activities were added to the effect statements Effect WILD-2 through Effect WILD-9.

Discussion of the potential effects on vegetation and wetlands from relocation of PG&E facilities has been added to Effect VEG-1 through Effect VEG-6.

O1-M

Giant garter snake habitat areas are mapped and do not cover most or all of the project site. PG&E will need to conduct work within mapped giant garter snake habitat during the May–October window, as this will be required in the USFWS BO and CDFW incidental take permit (ITP). SBFCA has determined which ditches and canals are considered suitable habitat for GGS and these are mapped in the biological assessment (BA) (currently being finalized). The measure for minimizing effects on giant garter snake is appropriate and SBFCA will be assisting PG&E to accomplish its work within the required timeframe. Comment did not necessitate change to the Final EIS.

O1-N

PG&E should remove vegetation during the September 1–January 31 period to the maximum extent feasible as required in the mitigation measure. If this is not possible in some situations, Mitigation Measure WILD-MM-12 (previously Mitigation Measure WILD-MM-9) would apply, which requires focused surveys for nesting birds before tree removal. Comment did not necessitate change to the Final EIS.

O1-O

It has been decided that the permanent loss of aquatic habitat for giant garter snake will be compensated through purchase of mitigation credits (see Appendix F.3).

O1-P

Comment noted. Text revised as suggested in Section 3.15.2.1.

O1-Q

Comment noted. Text revised as suggested in Section 3.15.2.2.

O1-R

Comment noted. Text revised as suggested in Section 3.15.2.2.

O1-S

Comment noted. Text revised as suggested in Section 3.15.2.2.

O1-T

Comment noted. Text revised as suggested in Section 3.15.4.2.

O1-U

Comment noted. Text revised as suggested in Section 3.16.2.3.

O1-V

Comment noted. Text revised as suggested in Section 3.17.4.2.

O1-W

Comment noted; because the commenter suggests no text revisions, text has not been revised in response to this comment. Comment did not necessitate change to the Final EIS.

O1-X

Comment noted; because the commenter suggests no text revisions, text has not been revised in response to this comment. Comment did not necessitate change to the Final EIS.

O1-Y

Comment noted. Comment did not necessitate change to the Final EIS.

O1-Z

Comment noted. Comment did not necessitate change to the Final EIS.

Letter O2—American Rivers Trust, et al., John Cain, et al., February 13, 2013

American Rivers ♦ American Whitewater ♦ Audubon California ♦ California Trout ♦ California Waterfowl Association ♦ Defenders of Wildlife ♦ Friends of the River ♦ Natural Resources Defense Council ♦ Planning and Conservation League ♦ Sacramento River Preservation Trust ♦ The Bay Institute ♦ Trout Unlimited ♦

Jeff Koschak
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Mike Inamine
Executive Director
Sutter Buttes Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

February 13, 2013

Dear Mr. Inamine and Mr. Koschak:

Thank you for the opportunity to provide comments on the draft environmental impact report and study (DEIR/DEIS) for the Sutter Butte Flood Control Agency's Feather River West Levee Project that will be largely funded by state, and potentially federal, taxpayers. Our organizations recognize the paramount importance of protecting communities from catastrophic flooding and are very interested in working with your agency to obtain the taxpayer funding necessary for advancing a sustainable flood management project that is consistent with the newly adopted Central Valley Flood Protection Plan by protecting communities in your service area, improving recreational opportunities for Central Valley residents, and enhancing fish and wildlife habitat.

Our organizations fully support development of a flood protection project to protect communities in the project area. However, we are concerned that the DEIR has not fully addressed many issues and recommendations made in the scoping process (see e.g., American River's scoping comments to the DEIR, attachments A and B). Among our concerns, is that the DEIR does not consider a reasonable range of alternatives, and more importantly, that the proposed project could increase long-term flood risk both for the communities in the project area and urban communities downstream along the Sacramento River. We look forward to working with you in the Feather River Regional Flood Planning process in the months ahead to better understand your agency's perspective on these issues and hopefully develop a common vision for a path forward incorporates the multi-benefit flood management approach of the CVFPP.

In the near term, we are eager to work with you to expedite a "no-regrets" phase of the project that is necessary to improve flood protection for Yuba City without foreclosing long-term, sustainable and multi-benefit flood management projects that are essential to meeting California's public and natural resource management needs of the future. We would support a different alternative than those analyzed in the DEIR that would reduce long-term flood risk for communities in the project area, reduce long-term liabilities for the state and federal government, improve long-term water supply reliability for the State Water Project, improve water quality, and enhance fish and wildlife habitat. Specifically, our organizations request a robust analysis of a hybrid alternative that would involve fixing levees in place adjacent to urban areas, setting-back some reaches of the levee to attenuate flood flows, constructing low ring levees and drainage channels to route flood waters away from urban areas to the western and southern portions of the study area, and elevating structures in rural areas that would still experience shallow flooding under this hybrid approach. Because we believe a hybrid approach would better reduce long-

term flood risk for area communities , achieve the multi-benefit objectives of the Central Valley Flood Protection Plan and ultimately be a better use of taxpayer funding, our organizations do not support moving forward with the project as currently proposed in section 2.2.3 of the DEIR/DEIS.

American Rivers has reviewed the DEIR and notes that it does not adequately evaluate a range of alternatives, the growth inducing impacts of the project, the potential for the project to increase flood risk (as opposed to decreasing it), or consider the robustness of various alternatives to account for and adapt to a changing climate. The following is a summary of issues raised by American Rivers and more detailed comments regarding deficiencies in the DEIR and the FRWLP. We would like to discuss these issues with you in an effort to advance a robust, sustainable and cost-effective project.

O2-A 1. The DEIR/DEIS incorrectly concludes that "the project has no significant effect on growth" and therefore fails to adequately describe growth inducing impacts or identify measures to mitigate these impacts, such as consistency with the SACOG Sustainable Communities Strategy.

O2-B 2. The project increases long-term flood risk to local communities, downstream communities, and the state and federal government by facilitating development on a levee "protected" flood plain. The proposed project will ultimately lead to more development that would be extremely vulnerable to catastrophic flooding when the proposed 200 year levee is overtopped or fails in a major flood event.

O2-C 3. The DEIR/DEIS does not provide sufficient information to properly evaluate the impacts of the proposed project on flood risk, agricultural land, traffic, air quality, fish and wildlife habitat, and other resources.

O2-D 4. The DEIR/DEIS analysis regarding compliance with federal Executive Order 11988 regarding floodplain management is flawed as the project is not consistent with the purpose of EO 11988 to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative".

O2-E 5. The DEIR/DEIR does not adequately consider a reasonable range of alternatives that could better protect public safety and the environment as required by CEQA. All three project alternatives evaluated in the DEIR are limited to modifying a federal levee along its existing alignment. The DEIR does not adequately consider other approaches such as levee setbacks, ring levees, flood bypasses, reservoir reoperation, elevating vulnerable structures, or a hybrid combination of all of the preceding approaches.

O2-F 6. The DEIR fails to advance a multi-benefit approach and is therefore inconsistent with the Central Valley Flood Protection Plan.

O2-G 7. The proposed project and its long-term operation will impede public access to the Feather River due to levee district policy of blocking public access to the Feather River corridor along public right-of-ways.

O2-H 8. The project does not adequately evaluate flood management performance under climate change or future hydrologic changes associated with a warming climate.

O2-I 9. The DEIR does not evaluate the performance of the project alternatives in combination with foreseeable projects such as an expanded bypass along the lower Feather River and Sutter Bypass pursuant to the Central Valley Flood Protection Plan.

O2-J 10. The project does not evaluate the cumulative effects of the proposed project and associated flood control reservoirs on the fish and wildlife resources of the Feather River and its tributaries.

Many of the problems with the project and DEIR/DEIS could be avoided or mitigated through a more comprehensive flood risk management approach designed to advance a more sustainable flood management system consistent with the Central Valley Flood Protection Plan. Growth inducing impacts and associated increases in flood risk could be avoided through a combination of flood compatible land use management, agricultural conservation easements, building codes, and a robust emergency response program. Flood risk

threats to downstream communities, project performance under climate change, and the lack of a multiple benefit approach could be resolved by a modified project design that utilizes a full toolbox of modern flood management strategies rather than a traditional levee focused approach.

Our organizations would like to work constructively with SBFCA and the USACE to expedite sustainable flood protection for the project area consistent with the Central Valley Flood Protection Plan, Executive Order 11988, and other applicable state and federal laws, plans, and policies. We believe that by working together we can develop a common vision that will better serve the taxpayers, and as a result, increase their willingness to invest in better flood management for the Central Valley.

Sincerely,

John Cain
American Rivers
Trust

Curtis Knight
California Trout

Diana Jacobs
Sacramento River Preservation

Chandra Ferrari
Trout Unlimited

Dave Steindorf
American Whitewater

Mark Hennelly
California Waterfowl Association

Gary Bobker
The Bay Institute

Monty Schmitt
Natural Resources Defense Council

Meghan Hertel
Audubon California

Kim Delfino
Defenders of Wildlife

Ron Stork
Friends of the River

Jonas Minton
Planning and Conservation League

Attachment A to Letter O2

American Rivers
Rivers Connect Us

Detailed Comments on the Feather River West Levee Project DEIR/DEIS

Prepared by American River

February 13, 2012

The following detailed comments to the Feather River West Levee Project (FRWLP) DEIR/DEIS supplement the cover letter submitted by several conservation organizations. The comments are based on a review of the information in the DEIR/DEIS and publicly available information properly referenced in the documents. If the project design is based on information not included or referenced in the DEIR/DEIS, we would appreciate learning more about how this information and analysis influenced the proposed project.

1. **The DEIR may erroneously conclude "the project has no significant effect on growth" and therefore may fail to adequately describe growth-inducing impacts or identify measures, such as consistency with the SACOG Sustainable Communities Strategy, to mitigate these impacts.**

   American River's 2011 scoping comments asked SBFCA to consider whether providing a 200-year level of flood protection would increase, rather than decrease, flood risk by incentivizing development in flood-prone areas. Per state law, the EIR discusses whether the proposed project could "foster economic or population growth, or the construction of additional housing, either directly or *indirectly*, in the surrounding environment." Highlights from the EIR section include:

   - Significant growth (above the state average growth rate) is expected in Sutter and Butte County by 2050, but primarily in Yuba City and Live Oak. Sutter County's population is expected to triple to 280,000 people and Butte County's population is expected to double to 440,000 people. (page 4-4);
   - The EIR does not mention the SACOG Blueprint or Sustainable Communities Strategy in its review of "key development planning documents." (page 4-6);
   - The FRWLP would potentially remove "approximately 6,300 acres from the current officially mapped FEMA floodplain; however, only roughly 25% of this acreage (about 1,500 acres) is within areas planned for growth under the adopted municipal general plans." (page 4-8)
   - The EIR concludes, "The FRWLP has limited influence on such growth because the area that would be potentially removed from the floodplain that is currently planned for

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development is very small (approximately 1,500 acres of the 185,675 acres of the affected area or .8%). The FRWLP, therefore, has no significant effect on growth considering the magnitude of this change" (page 4-8 and 4-9).

Given the lack of discussion of the SACOG Blueprint and Sustainable Communities Strategy in the EIR, as well as ambitious plans for growth in Sutter County and Butte County, it is difficult to believe the FRWLP will not have growth-inducing impacts that are inconsistent with state and federal policies. While there is insufficient information in the EIR to evaluate the conclusion that the FRWLP will have no effect on growth, a review of the General Plans for Live Oak, Yuba City, and Sutter County indicates significant plans for additional growth in the FRWLP planning area. Furthermore, the Sutter-Butte Flood Control Agency states in one public outreach document that the levee improvement project would allow growth consistent with "state law and local policies." Some of this Sutter County growth is inconsistent with the SACOG Preferred Blueprint Scenario and SACOG Sustainable Communities Strategy, planning efforts for the Sacramento region that are consistent with both state and federal policies.[1]. The Sutter-Butte Flood Control Agency provided some additional information about the source of the growth-inducing impact estimates a few days prior to the comment deadline, but more information is necessary to fully evaluate the validity of the estimates.

Since the FRWLP is largely dependent on state funding to move forward, it seems reasonable to expect consistency of the project with state and federal policies, such as reduced greenhouse gas emissions, reduced flood damage liability, decreased vehicle miles traveled, and preservation of farmland and open space. According to the Engineer's Report for the assessment, "the most important assumption in the cash flow analysis is that all funded improvements are subject to state cost sharing." Given the need for at least a 75% match of state funding, it is essential the project ensure consistency with state and federal policies, As discussed below (section 4), alternatives to a levee-focused approach that include a broad set of flood management measures would deliver a more sustainable and resilient flood protection system. In addition, any growth that is allowed as a result of the FRWLP should be consistent with the SACOG Preferred Blueprint Scenario and Sustainable Communities Strategy. Any proposed mitigation for growth-inducing impacts should help ensure such consistency.

Examples of inconsistency with the SACOG Preferred Blueprint Scenario and Sustainable Communities Strategy include, but are not limited to:

Live Oak. Growth plans for the small community of Live Oak are clearly inconsistent with the SACOG Preferred Blueprint Scenario and the Sustainable Communities Strategy. According to the Live Oak General Plan (adopted in March 2010), the City plans to increase the population from 6,225 in 2000 to 45,000 to 53,000 in 2030. Most of this growth is planned for undeveloped

[1] The Preferred Blueprint Scenario promotes compact, mixed-use development and more transit choices as an alternative to low-density development. The Sustainable Communities Strategy is a plan to meet the region's greenhouse gas emissions reduction target, while taking into account regional housing needs, transportation demands, and protection of resource and farm lands based on the best forecast of likely land use patterns across all 28 local jurisdictions in the Sacramento region.

farmland. According to the preferred Blueprint scenario for Live Oak by SACOG, the vision is that "Live Oak grows at a steady, modest pace to a city of just over 16,000 people by 2050." SACOG's Sustainable Communities Strategy indicates no expected growth in the sphere of influence before 2035 because of the low regional growth forecast. In total, the Sustainable Communities Strategy 2035 forecast for Live Oak includes 848 new employees and 1,305 new housing units or around 10,000 people (assuming 8 units per acre). Approximately 97 percent of the housing growth forecast by the Sustainable Communities Strategy is in established communities and is largely building out many of the newer existing subdivisions. This forecast is clearly inconsistent with existing Live Oak General Plan. SACOG also identifies as an "issue to track" whether regional market pressures for Live Oak housing will return once the economy grows again and whether "the planned improvements to the levee system are constructed, as expected, by 2015."

Unincorporated Sutter County. The proposal for a new rural community in the FRWLP planning area focused on the existing community of Sutter, as well as potential employment corridors, appears inconsistent with the SACOG Sustainable Communities Strategy,. The SACOG Sustainable Communities Strategy, forecast includes 2,598 new employees and 4,157 new housing units in unincorporated Sutter County by 2035, most (3,475 housing units) of which are in the community of Sutter Pointe outside of the FRWLP planning area and the remaining housing units are allocated to established communities. The 4,654 acres of projected growth for the community of Sutter in the Sutter County General Plan, on the other hand, would result in over 30,000 housing units (assuming 8 housing units per acre) not accounted for in the Sustainable Communities Strategy. It is also unclear whether the Sutter County General Plan projected growth in the Live Oak and Yuba City spheres of influence are consistent with the SACOG Sustainable Communities Strategy. The Sutter County General Plan also indicates the County has large plans for growth adjacent to Yuba City, particularly along Highway 99 south of Yuba City. It is unclear how much of this growth overlaps with growth accounted for in the Yuba City and Live Oak General Plans, as the Sutter County General Plan refers to the need to reach agreement with the cities regarding development.

It is also possible that the local governments could change zoning in the future, therefore increasing the project's growth-inducing impacts. Yuba City has not updated its General Plan since 2004, for example, and local governments in Sutter County and Butte County are not offering to restrict future growth in the planning area. Finally, even 1,500 acres of new development could result in significant population growth. Assuming 8 housing units per acre and 2.5 people per household, 1,500 acres would amount to 30,000 people. This represents a 50 percent increase in the population of Yuba City, currently at 64,000 people. Given these and other concerns described in these comments, additional information is needed to answer the following questions:

- How does providing flood protection to a 326 square mile areas (ES. 1.2) only remove 6,300 acres from the floodplain?
- How does the project only result in 1,500 acres of additional development when the General Plans for Yuba City, Live Oak, and Sutter County (not to mention Butte County) indicate proposals for significantly more growth?
- Where are the 1,500 acres located?

- How would this inundation limit growth under the no action alternative?
- Do Sutter County and Butte County need to build additional houses to provide the match required to construct the project?

Table 1: Sutter County Projected Growth for Study Area*	Acres
Spheres of Influence (SOI)	
Live Oak SOI	6,511
Yuba City SOI	5,886
Possible Future Expanded Yuba City SOI	5,079
Subtotal—Spheres of Influence	**17,476**
Rural Planned Communities	
Sutter*	4,654
Employment Corridor	
North of Yuba City	599
South of Yuba City	548
Subtotal—Employment Corridor	**1,147**
Industrial/Commercial	367
Total	**24,791**

Source: Sutter County General Plan (2011)

Growth inducing impacts of the proposed project could and should be mitigated by one or more of the following measures:

- Agricultural conservation easements to protect agricultural lands from urban development that would increase the risk of catastrophic flooding to life and property.
- Concentrate future growth in more compact developments designed to minimize loss of farmland, traffic impacts, and flooding hazards, consistent with the SACOG Sustainable Communities Strategy and Preferred Blueprint Scenario.
- Zoning restrictions and building codes to reduce the footprint and improve the flood resiliency of proposed development. Although SBFCA may not be able to impose these requirements, the local jurisdictions that will benefit the project could impose these requirements in exchange for the millions of state and federal dollars that will be invested in this project.
- Growth inducing impacts could be avoided by substantially altering the flood protection strategy.

2. **The project may increase flood risk to local communities, downstream communities, and the state and federal government by facilitating development on a levee "protected"**

flood plain. During the scoping period, American Rivers asked for these factors to be considered, but the DEIR ignored or dismissed them.

The project increases long-term risk to local communities by facilitating additional development in RD 1. Over the long-term, this new development will be extremely vulnerable to catastrophic flooding when the proposed 200-year levee eventually fails. By definition, a 200-year levee has a 12% probability of failure over the course of a 30 year mortgage. Assuming this level of risk simply to protect existing development is not necessary and is inconsistent with the primary objective of the Central Valley Flood Plan, which endeavors to reduce both the probability and consequences of flooding. Flood risk is the product of both the probability and consequences of flooding. Improving the levee in places reduces the probability of failure, and facilitating growth will actually increase the consequences of flooding.

Levees are not designed to withstand all foreseeable floods. When levees in the project area or in downstream areas fail, the state and federal government will be forced to spend billions on flood relief, as occurred during Hurricanes Katrina and Sandy, or to simply abandon the affected communities. Either way, the consequences for the state and federal taxpayers and economy will be devastating.

The project increases flood risk for downstream communities, particularly in metropolitan Sacramento, by increasing the probability that extreme floods will be routed downstream. Reinforcing the levees in the project area will reduce the probability of levee failure in the project area, and flood waters that would be routed into rural basins under the no action alternative will routed downstream where tens of thousands of people live in deep floodplains along the Sacramento River.

The DEIR/DEIS claims, but provides no evidence, that the proposed project would not cause increased flows, stage, and velocity in downstream areas during extreme events. A proper and legally required hydraulic analysis showing how the project would perform relative to the no-action would show the existing levee breaching during a 100 or 200 year event under the no-action. Comparison of this levee breach scenario with the proposed project specifically designed to reduce the probability of levee breach would show that more water moves downstream during extreme events under the proposed project.

In the absence of any proper hydraulic analysis supporting the contention that the project has no downstream hydraulic impacts, the DEIR/DEIS simply refers to misconstrued or misguided state policies in the following paragraph to arrive at the conclusion that the project has no downstream impacts:

> "Furthermore, these improvements would be consistent with the principles that have guided the management of the SRFCP over the past century and with the policies adopted by the state legislature calling for an immediate and comprehensive effort to increase the level of flood protection provided to the region in the SRFCP area. Finally, the CVFPB resolution adopting the CVFPP (Resolution No. 2012-25) states that . . . the

> Board has consistently found that no adverse hydraulic impacts are associated with levee strengthening projects that do not change the alignment or height of the levee, or the cross section of the channel and overflow area.
> Alternative 1 would therefore have no effect related to changes in water surface elevations and flood safety. Mitigation is not required. (pg. 2.1-20, 21)"

General state policy or practice does not provide a reasonable basis for ignoring the impacts of a specific project and do not supersede the requirements of NEPA and CEQA to document the impacts of specific projects. Moreover, the DEIR/DEIS analysis and deference to state policy and precedent is flawed in a number of ways. The claims that improvements are consistent with the principles that have guided the management of the SRFCP over the past century are unsubstantiated and at least partially untrue. There is a very long history of litigation and "levee wars" regarding the adverse effect of one landowners levee repair on another landowner's property, which are documented in the book Battling the Inland Sea.

The appeal to the state legislature's activities is equally flawed. Laws passed by the state legislature do call for an increased level of flood protection, but they don't require that it be done by improving levees in place in a manner that will increase downstream flood risk. To the contrary, they provide for a comprehensive approach that involves both "structural and nonstructural means for improving the performance and elimination of deficiencies of levees, weirs, bypasses, and facilities, including facilities of the State Plan of Flood Control ." They then enumerate a long list of objectives (which does not explicitly mention "levee improvements"), including expanding the capacity of the flood protection system in the Sacramento-San Joaquin Valley, to either reduce flood flows or convey floodwaters away from urban areas, reduce damage from flooding, and identify opportunities and incentives for expanding or increasing use of floodway corridors. As discussed in the alternatives section below, this project simply ignores these elements of the flood legislation in favor of a levee focused project.

It is true that the CVFCB resolution adopting the CVFPP stated that "nothing in the CVFPP . . . is intended to change the Boards practice for evaluation of hydraulic impacts. Under this practice, the Board has consistently found that no adverse hydraulic impacts are associated with levee strengthening projects that do not change the alignment or height of the levee," but this acknowledgement is not an endorsement of past practice or an application to the FRWLP. It simply says that the plan is silent on this subject. It might have made sense for the board to make such a determination where the action before them involved repair of a short segment of levee, but does it make sense when the repair involves substantially upgrading 41 miles of levee? Lastly, any casual observer of California flood management policy realizes that past practice is not necessarily good practice today. In fact, a troubled history of bad policy along with changing land use and climactic conditions prompted the legislature to pass and the governor to sign major legislation that dramatically reformed the CVFPB.

Despite the language of CVFPP (Resolution 15), the State System wide Investment Approach (SSIA) described in CVFPP is in fact an acknowledgement that repairing all upstream levees

to their original design capacity for both rural and urban areas is neither affordable nor desirable. It found that increasing repair to upstream levees to original design capacity without increasing levee height would increase stage by 1.2 feet in Sacramento, which is very significant. The SSIA instead opted for a strategy. If the CVFPP determined that fixing levees upstream would increase downstream flood stage, why would the proposed project be any different?

Mitigation Measures
Increases in flood risk associated with the project could be avoided or mitigated with some of the following measures:

- Increases in flood risk in the study area could be avoided by acquisition of agricultural easements or zoning restrictions, particularly on deep flood plains, to prevent development on deep floodplains.
- Increases in flood risk in the study area could be avoided, particularly in shallow floodplains, by instituting building codes requiring all new development to be constructed above the base flood elevation.
- Increases in downstream flood risk could be mitigated by modifying project design to maintain transitory storage in the study area or elsewhere.

3. **The DEIR/DEIS does not provide sufficient information for reviewers to evaluate the impacts of the proposed project.** Without this information, reviewers and decision makers may not be able to accurately evaluate the adequacy of the DEIR/DEIS or the value of the project.

Information on basic hydraulic studies is also not available in the DEIR/DEIS or any of the documents properly referenced in the document. The floodplain inundation maps (plates 2-14 thru 2-19) cite Peterson Brustad, 2012 as the source, but no description or reference for this document is provided in the entire DEIR. These documents and plates 2-14 thru 2-19 divide the various reaches into six different segments for the purpose of the underlying hydraulic analysis, but these segments are different than the 37 different study reaches. These hydraulic analyses are foundational to the flood performance and design of the project, but without proper references and documents, it is impossible to align the six "segments" which formed the basis of the underlying hydraulic analysis with the 39 "study reaches" described in the DEIR/DEIS. Aside from Plattes, 2-14 thru 2-19, the following statement from page 1-9 of the Executive Summary is the only reference in the DEIR/DEIS:

> "Note: Certain planning and engineering studies for the project make reference to segments within the planning area under which the reaches above are grouped. These segment designations do not have substantial bearing on the alternatives descriptions, environmental setting, or determination of effects and therefore are not used in this document for simplicity."

This statement is incorrect. The underlying hydraulic analysis reported using the segment system is foundational to alternative formulation and justification. It is impossible to

evaluate which levee segments must be fixed to protect Yuba City from deep flooding. Project proponents at SBFCA did not provide the proper reference documents or citations even after we made a special request before the end of the comment period.

Mitigation
This deficiency could be remedied by reissuing the DEIR/DEIS with specific maps delineating the parcels that will be removed from floodplain and susceptible to urban development as a result of the project.

4. **The DEIR/DEIS analysis regarding compliance with Executive Order 11988 regarding floodplain management is flawed.** The project appears to be in violation of Executive Order 1198, which is attached. The DEIR/DEIS explains that:

> "E0 11988 requires a Federal agency, when taking an action, to avoid short and long-term adverse effects associated with the occupancy and modification of a floodplain, and it must avoid direct and indirect support of floodplain development whenever there is a reasonable and feasible alternative. "

Section 4.1.2.1 of the DEIR/DEIS argues incorrectly that there are not reasonable or feasible alternatives. As discussed in more detail below the DEIR/DEIS did not sufficiently evaluate other alternative designs that could "avoid direct or indirect support of floodplain development.

The project entails modification of a federal levee and will require a 408 permit from the Unites States Army Corps of Engineers (USACE) under the Rivers and Harbors Act of 1908. It is not realistic to assume that USACE will disregard EO 11988. As a result, the project proponents decision to screen out other alternatives will risk delaying implementation of badly needed flood protection improvements for the project area. Flood protection for existing communities and structures in the project area could be expedited by implementing the mitigation measures identified in sections 1 and 2 above or by considering a broader range of alternatives.

5. **The DEIR/DEIR does not adequately consider a reasonable range of alternatives that could better protect public safety and the environment as required by CEQA.** All three project alternatives evaluated in the DEIR are limited to modifying a federal levee along its existing alignment. The DEIR does not adequately consider other alternatives such as levee setbacks, ring levees, flood bypasses, reservoir reoperation, or elevating vulnerable structures. The DEIR/DEIS fails to adequately consider several critical and viable alternatives, including those identified in the initial project scoping period (Attachment B).

Section 2.7 describes the screening process that proponents used to screen-out various flood management approaches such as set-back and ring levees, but the assumptions and information utilized in this screening process are flawed, and more importantly, the

screening process did not consider any hybrid alternatives comprised of a broad toolbox of approaches. Failure to consider an alternative that considered more than one approach led the proponents to discard approaches simply because one single approach was not sufficient to provide protection in the view of the proponent. It is worth noting that the recommended alternative uses a hybrid approach that relies on both seepage berms and slurry walls. Would it have been reasonable to discount one of these two approaches simply because anyone of these two approaches by themselves would have been insufficient?

The underlying hydrology and hydraulic analysis that this screening analysis is based upon is not referenced in the DEIR/DEIS making it difficult to evaluate the performance of alternatives screened from the analysis. From discussions with SBFCA staff during the comment period, we learned that screening analysis was based in part on analysis conducted in 2010 as part of the "study area plan" prepared by Peterson Brustad, but this analysis was not presented as part of the DEIR/DEIS, was not referenced in the DEIR/DEIS, and is not publicly available. We were only able to obtain a copy of this document two days before the end of the comment period and are currently reviewing it. It does provide some overly simplistic analysis of ring levees, J levees, and a flood bypass; but it does not consider other flood management approaches such as zoning, building codes, and flood insurance. Moreover, it appears that the underlying hydraulic analysis did not assume the existing TRLA setback on the left bank or potential levee setbacks downstream in combination with the approaches screened. Due to the lack hydraulic information, we were unable to evaluate the validity of the screening analysis. We look forward to learning more about this analysis in future discussions with the project proponent.

Many of the problems with the project and DEIR/DEIS could be avoided or mitigated through a more comprehensive flood risk management approach designed to advance a more sustainable flood management system. As illustrated in the following figure and described in the attached paper by Major General Don Riley (Attachment C), a previous director of Civil Works for the Army Corps of Engineers, levees are only small part of what is necessary to protect communities from flooding. Failure to consider a hybrid approach results in a defective project and DEIR/DEIS.

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Detailed Comments to the DEIR
American Rivers

We therefore request that the DEIR/DEIS and the underlying project description be substantially revised to identify and consider a comprehensive alternative that utilizes multiple approaches for improving flood protection for the project area. A hybrid approach could better reduce long-term liabilities for the state and federal government, reduce long-term flood risk for communities in the project area, improve long-term water supply reliability for the State Water Project, improve water quality, and enhance fish and wildlife habitat. Our organizations would support a hybrid alternative that would involve fixing levees in place adjacent to urban areas, setting-back some reaches of the levee to attenuate flood flows, constructing low ring levees and drainage channels to route flood waters away from urban areas to the western and southern portions of the study area, and elevating structures in rural areas that would still be vulnerable to shallow flooding under this hybrid approach.

Levee Setbacks

The screening process uses the following three arguments to remove setback levees from further consideration: 1) incompatibility with existing land uses, 2) environmental impacts of levee setbacks, and 3) relative cost of levee setbacks (FRWLP 2.7.2.1). We provide detailed comments on these three lines of reasoning below:

- The document cites poor compatibility with land use due to the potential for conversion of existing agricultural, commercial, and residential land, and for subjecting additional lands to flooding as a reason for screening out setback levees as a feasible alternative. New floodplain associated with setback levees is not *de facto* removed from agricultural uses. To the contrary, the majority of the land currently in the floodway is farmed, and

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much of it is in perennial tree crops. Even if setback levees removed land from agricultural production, setbacks should be considered for their public safety benefits. According to an analysis conducted for SBFCA and the USACE, levee setbacks in or near the project area would substantially reduce flood stage and velocity, and presumably the risk of levee failure. Lastly, this consideration fails to consider the value to water quality and fish and wildlife that would result from setback levees, effectively ignoring significant environmental benefits of levee setbacks.

- The document cites concerns for environmental effects on land use, mineral resources, transportation, air quality, noise, and other resources as a reason for screening out setback levees as a feasible alternative. Effects on mineral resources and transportation are unsubstantiated in the document, and seem very unlikely. Effects on air quality, noise and "other resources" would be short term in nature, and not likely to be much greater than those associated with the recommended alternative, or the growth facilitated by the alternative. In the long-term, setback levees would improve air quality, and would reduce noise impacts on wildlife and recreational river users by increasing the natural buffer between the river and surrounding sources of noise pollution. The long-term benefits to public safety, river health, fish and wildlife habitat, and recreation greatly outweigh any immediate, short-term impacts associated with the construction of setback levees.
- The document cites concerns for the cost of setback levees relative to other alternatives considered. No supporting information is provided in the document regarding cost estimates, how they were calculated, or if they were quantified at all. However, in a previous document titled Pre-Design Formulation Report on the FRWLP, segments 1 to 7, the costs of using setback levees is compared to that of *in situ* levee improvements (included in Appendix B). The criteria for consideration of setback levees as an alternative was a cost ratio of less than 5:1 (setback levee: *in situ*). One scenario for the considered segment was found to be at a ratio of 3:1. While other setback alternatives had a higher ratio, it appears that the cost of levee setback was exaggerated due to unrealistically high land cost estimates. The analysis assumes land costs of $25,000 per acre, but the costs of agricultural land is significantly less.

Setback levees are not suitable options in all circumstances, but setback levees in selected locations require further consideration as a project alternative, or as additional measures in the considered alternatives. Many segments of the project reach are strong candidates for setback levees, and ultimately, the recommended alternative should not be without setback levees as a central part of the overall project. Inclusion of setback levees would be complimentary to other Feather River projects such as the planned floodplain augmentation at the Oroville Wildlife Area, and the Feather River Setback Levee at Star Bend, and could together create unprecedented benefits for the watershed through improvements in public safety, fish and wildlife habitat, and recreational opportunities.

These benefits of setback levees and other alternatives become especially important in light of the predicted effects of climate change for the region as discussed below. Peak flows are expected to occur earlier, rain-on-snow events and their associated extreme flooding are

expected to occur more frequently, and more precipitation is expected to fall as rain instead of snow through the winter. These factors will complicate the management of reservoirs for multiple benefits and decrease the predictability of high flow releases, making the adaptive capability of the greater floodplain area associated with setback levees increasingly valuable in the future.

Ring Levees

Ring levees and all variations of the ring levee concept are excluded on the basis that they fail to protect the entire reclamation district from 200 year flood protection, but based on discussion with SBFCA staff it is our understanding that the recommended alternative does not provide 200 year protection for the entire area. The following language from table 2-21 explains why ring levees were excluded from further consideration:

> "Fail; ring levee(s) may achieve 200-year protection for the area within the ring (or areas within multiple rings) but would not address the project objective to reduce flood risk for the entire planning area. The vast majority of the planning area would remain at current or heightened risk levels, especially agricultural communities, commodities, and infrastructure."

This preceding statement is problematic for a number of reasons. It is based on a misunderstanding of the definition of flood risk and neglects to consider the role that other risk management measures could play to reduce flood risk for the entire study area in combination with a ring levee approach. Risk is quantified by multiplying the probability of flooding by the consequence of flooding. By definition, ring levee that protect urban areas reduce risk for the entire area by reducing the probability of flooding in urban areas where the consequences of flooding would be greatest for the entire study area. Furthermore, ring levees in combination with other measures could reduce risk for areas outside of the ring levees. For example, elevating structures in shallow agricultural floodplains or providing flood insurance for less protected areas would also reduce flood risk.

Ring levees protect urban areas by routing flood waters to other locations. There are many potential variations of ring levees or cross levees in combination with drainage swales that could route flood waters away from urban areas in the service area. For example a low cross levee combined with a drainage swale created immediately north of Yuba City could route flood waters around Yuba City and into the low lying western and southern areas of the study area. Although this approach would not provide the same level of flood protection for the rural areas north of Yuba City, it would also not require routing all floodwaters downstream toward Sacramento for the purpose of protecting Yuba City. As a result, it would not transfer flood risk from upstream areas to downstream areas, a problem discussed in section 2.

J Levees

A J-levee is a special hybrid of repair-in-place of existing levees and ring levees, with the "J" referring to the shape of the levee in planform. Rather than entirely encircling a limited area like a ring levee, a J-levee would combine repair-in-place of existing levees connected with a

partial ring levee(forming the "J" shape). Table 2-22 eliminates a J levee from further consideration for the following reason:

> "Uncertain; a J-levee may need further evaluation to determine ability to meet the project objective to reduce flood risk for the entire planning area."

If more evaluation is necessary to determine if a J-levee could meet the project purpose, why was it excluded from further evaluation?

Reservoir Reoperation and Flood Bypasses
Reservoir reoperation and flood bypasses were excluded because they were outside of the jurisdiction of the project proponent. This may be a reason for the project proponent to exclude this measure from further consideration, but if the state and federal government is paying for 80% or more of the project, is not a legitimate reason for them to exclude it from further analysis.

Raising Building Pads
Raising building pads was excluded from further analysis with the following language from table 2-26:

> "Fail; raising building pads would not meet the objective to reduce flood risk for the entire planning area because approximately 30,000 existing structures would need to be modified which is not reasonably feasible and because tens of thousands of acres of agricultural lands would remain at risk."

The reasoning from the preceding statement is fundamentally flawed and no data is presented to show that it is actually cost prohibitive. Raising building pads to one foot above BFE would in fact substantially reduce flood risk, if not eliminate it for all structures. No data is presented on exactly how many structures exist in the planning area and how many would need to be elevated. Most historic structures are elevated above ground level because early residents knew that doing so was prudent. It may not be feasible for the entire planning area, but it could play a substantial risk reduction role in large areas of the planning area. Lastly, while it is true that raising building pads would not reduce probability of flooding for agricultural lands, but the consequences of temporary flooding on agricultural lands is relatively low compared to urban flooding in other parts of the state. The state and federal taxpayers are not inclined to spend millions or billions of dollars to protect agricultural lands from very infrequent flood events.

6. **The DEIR fails to advance a multi-benefit approach and could preclude future multi-benefit projects along the Feather River, which would be inconsistent with the Central Valley Flood Protection Plan.** We are particularly concerned that building the proposed project would foreclose any opportunities to restore floodplain habitat in the Feather River floodway. Floodplain restoration is essential to restoring habitat for endangered salmon and other fish and wildlife species. Protection and restoration of endangered salmon runs is necessary to comply with the state and federal Endangered Species Act. Failure to restore salmon populations could severely affect the State Water Project, which provides water to

tens of millions of Californians. Once the project is built, it will be difficult if not impossible to obtain permits for floodplain restoration projects that locally increase flood elevations even slightly. We have no assurances that the project proponent or other local entities would not litigate to stop any project with even minor hydraulic effects.

At the direction of the state legislature, the Department of Water Resources spent four years and large amounts of money preparing the Central Valley Flood Protection Plan (CVFPP) to meet a variety of flood management and ecological objectives enumerated in section 9616 of the California water code (attachment C). The plan includes a number of objectives including promoting ecosystem function and multiple benefit projects. The Central Valley Flood Protection Board amended and adopted with CVFPP with a board resolution that requires development of multi-benefit projects. Resolved 11(m) states:

> "Wherever feasible, improvements to the SPFC should be implemented in accordance with CWC § 9616 and provide for multiple benefits through projects designed to improve public safety while achieving other benefits, such as restoration of ecosystem functions and habitats within the flood management system."

By their own acknowledgement, the project proponents have made no attempt to design the project to meet multiple-benefits or restore ecosystem function. The project proponents expect to obtain well over $100 million in state funds to construct the project, but it is not clear why the state should support the project without assurances that the project proponents will support multiple benefit projects along the Feather River once their project is completed.

7. **The proposed project will continue levee district policy of blocking public access to the Feather River corridor, a public trust resource.** The DEIS/DEIR recognizes that there is demand for increased recreational and public access opportunities on the Feather River within the project area, but existing practices by the SBFCA or its member agencies prevent the public from accessing the Feather River along public right-of-ways.

   Access to the Feather River from the dry side of the levee is obstructed by the levee, a man-made barrier predating this project but related to it. It is illegal to climb the levee other than at ramps, because climbing the unprotected bank of the levee may cause erosion and damage the levee. This obstruction of access to the river and its banks is mitigated by the presence of ramps providing a means of crossing between the lands on the wet side of the levee and lands on the dry side of the levee. These ramps are currently obstructed by gates which are almost always maintained locked closed by levee maintenance organizations (Department of Water Resources (DWR), Levee District Number One of Sutter County (LD1), Levee District Number Nine of Sutter County (LD9)). Each of these entities is a California public agency. DWR is an "authorizing stakeholder" in the project, and LD1 and LD9 are constituent parties to the Sutter Butte Flood Control Agency joint powers agreement. The levee, gates and the practices of maintaining the gates locked closed are pre-existing facts which must be considered a cumulative with the effects of this project. The pre-existing practice of keeping the gates locked closed is a good indicator that the levee maintenance

organizations will keep the gates locked closed after the project is completed, which also must be considered as a cumulative effect of the project.

Levee District 1 in Yuba City area has consistently locked gates and restricted access to the river despite complaints from the public. Roads that connect Highway 99 and other main arteries to the river were authorized by the Sutter County Board of Supervisors as public thoroughfares to the river in the mid-1800s. These roads are maintained by the County. In the last ten years, farmers have installed "No Trespassing" signs, and in some cases, gates or other obstacles that discourage public access to these public roads. LD 1 has permanently locked a gate across a public road at Star Bend. The County Public Works Department has been reluctant to remedy the situation by demanding that access to the public be kept open.

The public has the right to access and use the river and the adjacent dry land below the high water mark, and state and local agencies have an obligation to avoid impinging on this right. We are concerned that FRWLP will decrease options for public access through removal of levee ramps or maintaining the practices of maintaining locked gates. The DEIS/DEIR does not adequately address impacts to recreation and public river access. The DEIS/DEIR provides no assurances that SBFCA will seek commitment from its member agencies to improve upon past policies and practices, and allow public access to the river and floodplain to the maximum extent feasible. More detailed comments on recreation and public access were provided by Francis E. Coates, which we incorporate in these comments by reference.

In addition to the indirect consequences of this project on access to public recreational resources, the construction of new flood facilities could directly impede public use. The EIR/EIR states in Chapter 3.14 that "Seepage and stability berm installation in Alternative 3 could affect the long-term access to portions of the Oroville Wildlife Area, O'Connor Lakes Unit and Nelson Slough Unites of the Feather River Wildlife Area and the Bobelaine Audubon Sanctuary. The new topography on the approach side of the these facilities may requires the construction of new roadway and trail access, utilities, parking, staging and other facility or infrastructure improvements. With the implementation of the environmental commitment requiring reconstruction of affected formal park facilities and preservation of boat launch access during and following construction activities (described in Chapter 2, Alternatives), this effect would be less than significant. No mitigation is required." We were unable to find any such "environmental commitment" to reconstruct formal park facilities and preserve boat launch access in the referenced section. Moreover, even if there were such a commitment made, there is little assurance that the level of access presently available to the public through informal access and by means of other facilities beyond "formal park facilities" and boat launches would not be impaired by this project.

8. **The project does not adequately evaluate performance under climate change or future hydrologic changes associated with a warming climate.**

The final engineers report for the Sutter Butte Flood Control Agency by Parsons Brinkerhoff (July 14, 2010) provides the following description of changing hydraulic conditions, but the DEIR does not provide an analysis of how the project will perform under anticipated hydrologic conditions.

> "California weather is changing, perhaps as a result of global climate change. More precipitation is falling in the mountains as rain, and less as snow pack. This change will increase the stress on the region's flood control system."

Despite this acknowledgement, the project does not provide any analysis of how the project will perform under a changing climate and does not appear to utilize climate change hydraulics and hydrology to evaluate project alternatives. An analysis that considered the high probability of climate change would very likely reach different conclusions regarding the merits of various flood management approaches, all of which were screened-out of the alternatives analysis.

These benefits of setback levees and other alternatives become especially important in light of the predicted effects of climate change for the region. Peak flows are expected to occur earlier, rain-on-snow events and their associated extreme flooding are expected to occur more frequently, and more precipitation is expected to fall as rain instead of snow through the winter. These factors will complicate the management of reservoirs for multiple benefits and decrease the predictability of high flow releases, making the adaptive capability of the greater floodplain area associated with setback levees increasingly valuable in the future.

9. **The DEIR does not evaluate the performance of the project alternatives in combination with existing and foreseeable projects that have or will expand flood carrying capacity in the lower Feather River, such as an expanded bypass along the lower Feather River and Sutter Bypass.**

The study plan hydraulic analysis (Peterson Brustad, 2010), which purportedly forms the basis for the underlying alternatives analysis, including the alternatives screening analysis described in section 5 above, does not include the TRLA set-back project as part of the base case. The TRLA set-back project reduces flood stage elevations by six inches, which is very significant. Furthermore, the hydraulic analysis used to screen-out several alternatives does not consider the synergistic effects of downstream levee setbacks that are planned for in the CVFPP. A July 2011 analysis of Lower Feather River set-back levees found that a setback downstream of Laurel Road could lower flood stage elevations in the lower Feather River by one to two feet in the vicinity of Yuba City. This is very significant, especially since inundation depths in most of Yuba City under several breach scenarios (depicted in plates 2-14 to 1-19) are less than two feet. How would various scenarios that were screened-out using other hydraulic assumptions (Peterson Brustad, 2010) such as levee set-backs, ring levees, and raised build pads perform differently if the hydraulic analysis had assumed a major levee setback downstream of Laurel Road? To provide a credible alternative analysis and to qualify for state funding, the project proponents should reconsider how various alternative approaches would perform assuming a major levee set-back in the lower Feather River as proposed in the CVFPP.

February 13, 2013
Detailed Comments to the DEIR
American Rivers

10. The project does not evaluate the cumulative effects of the proposed project and associated flood control reservoirs on floodplain habitats and the fish and wildlife resources of the Feather River and its tributaries.

The system of dams, levees, canals on the Feather River and the urban and agricultural they support in the study area have contributed to the precipitous decline of fish and wildlife resources. Spring-run salmon on the Feather River are endangered and fall-run salmon are greatly reduced. The decline of these fisheries has imposed severe hardship on commercial fisherman and deprived recreational anglers of a value past time and food source. Salmon and other fisheries like the Sacramento Splittail are dependent on inundated floodplain habitat for reproduction or nursery habitat. Floodplains are also a source of primary and secondary productivity for a number of other fish and wildlife species.

Oroville Dam, project levees, particularly in the lower portion of the study reach, agriculture in the flood way, historical dredging activities, and local berms constructed to reduce the frequency of agricultural land in the floodway have all contributed to the decline of floodplain habitat, and by extension, fish and wildlife dependent on those habitats. Modern perennial agriculture (orchard) in the floodway is only possible because of the regulation of the Feather River by Oroville Dam and the state water project, which has further reduced the area and frequency of inundated floodplain habitat.

The same can be said for terrestrial and avian species, particularly migratory birds. The river floodplains historically provided wetland habitat for millions for ducks, geese, swans, and other waterfowl that evolved to over-winter in the Central Valley, particularly in the Sacramento Valley. Those wetlands were reduced to below 5% of their historical extent due to the construction of levees and other land use changes. An important recreational resource and industry is now dependent on artificially flooded lands and subject to the uncertainties of water supply, electricity prices, farm practices and government appropriations to sustain them.

There is clear scientific evidence documented in several peer reviewed scientific studies that restoration of floodplain habitat would substantially improve fisheries populations. Some of these fish populations are endangered, which may require extraordinary measures by the state water project, to release substantially more water during the spring for the purpose of increasing the frequency of inundated floodplain habitat. Alternatively, floodplain habitat could be restored with considerably less water by reconnecting floodplains and secondary channels in the Feather River floodway that are currently blocked by small levees or berms or by increasing the elevation of the channel thalweg where it was previously dredged. These manipulations in the floodplain, however, would by design increase water surface elevations at least for moderate flood events. As discussed in section six above, we are concerned that the project proponents or other parties will litigate to prevent future floodplain restoration once their project has been built on the technical grounds that such floodplain restoration would increase water surface elevations during floods. Although, it is not necessarily true that floodplain restoration would increase water surface elevations during large flood events, opponents to such restoration could preclude it indefinitely with legal arguments that it would compromise public safety.

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The proposed project to build the levee in place does not create any additional flood conveyance capacity and therefore any future efforts that could conceivably decrease flood conveyance would be viewed by local, state, and federal flood management agencies as an impact to public safety that must be mitigated. As discussed above, the project would facilitate additional urban development in the levee "protected" floodplain increasing the public safety imperative and thus aggravating the perceived, if not real, conflict between public safety and fisheries restoration. The very best way to protect public safety, particularly against the increasing storms that climate change will bring, is to give the river more room to safely convey flood flows. Giving the river more room also allows for other uses of the floodplain such as recreation, trails, wetlands that filter and cleanse water, and fish and wildlife habitat.

Attachment B to Letter O2

American Rivers
Thriving By Nature

July 5, 2011

Ingrid Norgaard, Project Manager
Sutter Butte Flood Control Agency
c/o ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Dear Ms. Norgaard,

American Rivers, in its commitment to river conservation, public safety, and sustainable flood management, would like to offer comments with respect to the proposed Feather River West Levee Project (FRWLP). It is American Rivers' concern that the project, as currently proposed, fails to incorporate long-term, sustainable flood management strategies, and places both human and natural communities at increased risk of future catastrophic flooding.

The project's EIR/EIS should examine a broad range of issues and mitigation alternatives in order to formulate a more comprehensive and sustainable approach to flood management in the Sutter/Butte region, as described below.

Growth Inducing Impacts
The report should consider whether providing 200-year flood protection from Thermalito Afterbay to Yuba City north would increase, rather than decrease, flood risk by incentivizing development in these flood-prone areas. Flood risk, as defined by the state of California, equals the probability of flooding multiplied by the consequences of a flood. Although the project will reduce the *probability* of local flooding, the *consequences* of eventual flooding in a heavily developed community would be much more severe. Facilitating development efforts by cities, counties, and property owners in flood-prone regions may substantially increase flood risk over the long term.

Downstream Flood Impacts
In its emphasis on structural levee improvements, the proposed project could route more floodwater downstream to urban communities. By reducing the probability of levee failure in the Yuba City area during a large flood event, the project would necessarily increase the probability that flows would be routed downstream, and this would increase the risk of catastrophic flooding in Sacramento and West Sacramento. The report should consider and select alternative improvement measures that would avoid or mitigate these impacts.

Impacts Under Climate Change
The project should consider whether the proposed levee improvements will actually provide 100-year and 200-year protection under projected future flows assuming climate change.

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July 5, 2011
Feather River West Levee Project
American Rivers Comments

Evaluate a Broader Range of Alternatives
In order to better advance the state and federal flood management goals, the EIR/EIS must evaluate a broader range of alternatives including:

1. **Levee Setbacks**: Evaluate the potential benefits of levee setbacks, including reduced operations and maintenance costs, improvements to local flood protection in the face of climate change, and benefits for fisheries and wildlife habitat.
2. **Ring Levees and Building Modifications**: Examine the potential that ring levees offer for protecting the existing communities of Gridley, West Gridley, Biggs, and Yuba City as an alternative to the proposed project. Elevate buildings outside the ring levees to protect against flooding.
3. **Flood Bypass**: Evaluate the opportunity to reduce peak flows during extreme flood events by rerouting floodwaters into the Butte Basin through a new flood bypass. Such a bypass could divert water out of Thermalito Afterbay and the Feather River and into the Cherokee Canal.
4. **Oroville Reservoir**: Consider opportunities for reducing extreme flood events by reoperating the Oroville reservoir either to expand the flood reservation or improve real time operations during flood events.
5. **Oroville Wildlife Area Levee Modification**: Explore opportunities for reducing peak flood flows through planned modifications to levees adjacent to the Oroville Wildlife Area that would increase flooding of the OWA. Modifying levees along the OWA is required by Article A106 Riparian and Floodplain Improvement Program in the Settlement Agreement for the Relicensing of the Oroville Facilities, FERC Project 2100, executed by the Department of Water Resources and 52 other parties in March 2006.

The costs and benefits of all alternatives should be evaluated in light of the life cycle costs of maintaining and operating the project.

By examining the aforementioned potential project impacts and considering additional mitigation alternatives, the FRWLP can adopt a sustainable flood management vision and offer long-term public safety as well as ecological benefits to the communities of the Sutter/Butte region.

We hope that, in compiling the EIR/EIS and in moving forward with the project, the Sutter Butte Flood Control Agency and its collaborators will consider our comments and be part of the movement towards a safer, more sustainable future for California's Central Valley.

Respectfully,

John Cain,
Director of Conservation
California Flood Management

Megan Randall,
California Flood Management Fellow

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Attachment C to Letter O2

2/26/2008

**IMPROVING PUBLIC SAFETY –
FROM FEDERAL PROTECTION TO SHARED RISK REDUCTION**

**Major General Don Riley
US Army Corps of Engineers**

Responsibility for flood risk management in the United States is a shared responsibility between multiple Federal, State, and local government agencies with a complex set of programs and authorities. Nationally, both the US Army Corps of Engineers (USACE) and the Federal Emergency Management Agency (FEMA) have programs to assist states and communities in reducing flood damages and promoting sound flood risk management. The authority to determine how land is used in floodplains and to enforce flood-wise requirements is entirely the responsibility of state and local government. Floodplain management choices made by state and local officials, in turn, impact the effectiveness of federal programs to mitigate flood risk and the performance of federal flood damage reduction infrastructure. One key challenge is to ensure that as the public and government leaders make flood risk management decisions, they integrate environmental, social, and economic factors and consider all available tools to improve public safety. Importantly, we must ensure the public is educated both as to the risks they face and actions they can take to reduce their risks. Because of this complex arrangement of responsibilities, only a life-cycle, comprehensive and collaborative systems approach will enable communities to sustain an effective reduction of risks from flooding.

Where we are now – "The government will protect us"

Individual agency processes and procedures typically have provided the venue for planning and implementation of flood damage reduction measures. The present process to engage the Corps of Engineers is on a project by project basis, even though the Corps has made advances in incorporating collaborative approaches and assessing alternatives in a watershed context. Traditionally, the Corps focuses on reducing flood damages by managing floods that cause damage largely by decreasing the probability of flooding. The Corps develops alternatives based on reducing known potential flood damages, with minimal consideration of future land use or other social effects. Additionally, the Corps infrequently assesses options to reduce consequences should a failure occur. Whether communities strive for 1% level of protection or greater, the present process drives decisions based on reducing the potential for failure or *reducing flood damages* and does not incorporate an assessment of localized risks and consequences. Figure 1 is an example of the present paradigm – a system based on an appropriate "level of protection", which provides credence to the notion that "the government is responsible" and "therefore, we are protected." Complicating the matter, many prudent cost share sponsors seek to limit their costs; which drives some to seek to achieve only a level of protection whereby community members will not be required to purchase flood insurance.

2/26/2008

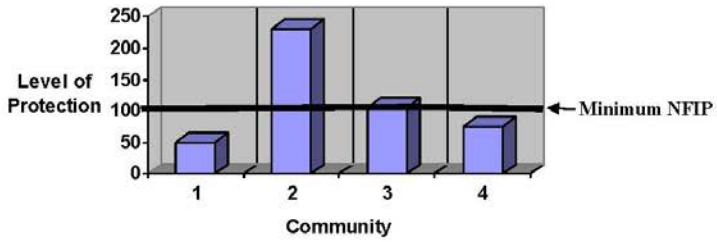

Figure 1 – Selecting Level of Protection

Where we need to be – "We are all responsible for our safety"

To significantly improve public safety, we are pursuing a level of public education at which our fellow citizens are so well informed they are able to assume responsibility for decisions they make about where and how they want to live and work. We then can engage in a comprehensive and multi-government and private citizen collaborative process to *managing flood risk* to achieve levels of tolerable risk. The Corps is expanding our traditional approach to focus on the most effective combination of tools available that citizens may use to lower or "buy down" their flood risk (as illustrated in Figure 2). We will consider not only reducing the probability of flooding, but also reducing the consequences should a flood occur. A multitude of options and tools becomes more evident through the process of assessing the consequences of a flood. Furthermore, the decision on which tools to implement involves all stakeholders. For example, the Corps can help reduce risk by levee construction. Whereas in a coordinated but independent action, local government can further reduce flood risk by implementing flood plain management actions such as evacuation plans, zoning ordinances, and public outreach.

This cannot be achieved without a new paradigm of joint partnerships in a comprehensive approach of public education and flood risk management. For instance, the insurance industry has a similar goal of assessing hazards and therefore, there exists an opportunity for the federal government and insurance industry to leverage mutual efforts, such as in the areas of research and development, implementation of assessment tools, and increase of public and policy-makers awareness.

2/26/2008

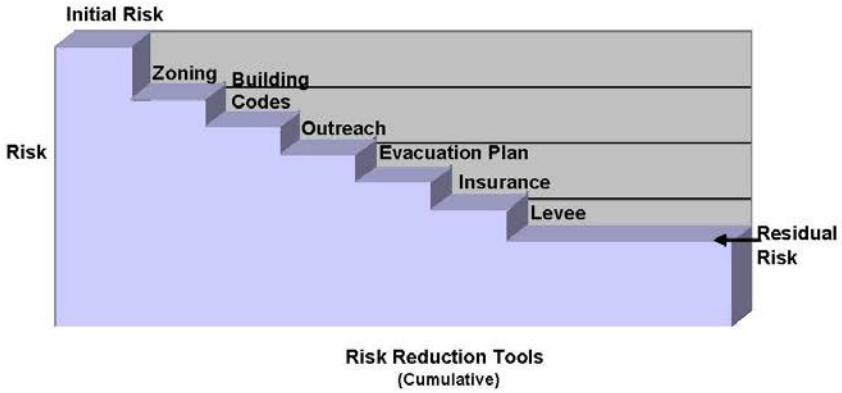

Figure 2 - FLOOD RISK MANAGEMENT: ALL STAKEHOLDERS CONTRIBUTE TO REDUCING RISK

What we are doing now

In May 2006, USACE established the National Flood Risk Management Program (NFRMP) to take the first step of bringing together other federal agencies, state and local governments and agencies, and the private sector to develop and implement a unified national flood risk management strategy that eliminates conflicts between different flood risk management programs and takes advantage of all opportunities for collaboration. Additionally, we are seeking partnerships with those that best understand risk, such as banking and insurance industries to share data and risk model development. We also wish to collaborate more closely with business councils and developers so they understand local flood risks, and can assist us in public education campaigns.

An integral part of the NFRMP is the Interagency Flood Risk Management Committee (IFRMC), with core leadership from USACE, FEMA, Association of State Flood Plain Managers (ASFPM), and the National Association of Flood and Stormwater Management Agencies (NAFSMA). This committee will be expanded to include other stakeholder groups, such as resource agencies. Through this process, organizational leadership should use or change, when practicable, existing policies and programs to transition into a comprehensive and shared process of lowering or "buying down" flood risks. As the transition occurs, the IFRMC should identify and recommend necessary administrative, policy, and legislative changes for complete implementation of the collaborative risk-informed decision process for managing flood risks.

Letter O3—American Rivers Trust, et al., John Cain, et al., February 15, 2013

Letter O3

Conservation Community Comment Letter

on the Feather River West Levee Project

February 15, 2013

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American Rivers ♦ American Whitewater ♦ Audubon California ♦ California Trout
California Waterfowl Association ♦ Defenders of Wildlife ♦ Friends of the River
Natural Resources Defense Council ♦ Planning and Conservation League
Sacramento River Preservation Trust ♦ South Yuba River Citizens League
The Bay Institute ♦ Trout Unlimited

Jeff Koschak
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Mike Inamine
Executive Director
Sutter Buttes Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

February 15, 2013

Dear Mr. Inamine and Mr. Koschak:

Thank you for the opportunity to provide comments on the draft environmental impact report and study (DEIR/DEIS) for the Sutter Butte Flood Control Agency's Feather River West Levee Project that will be largely funded by state, and potentially federal, taxpayers. Our organizations recognize the paramount importance of protecting communities from catastrophic flooding and are very interested in working with your agency to obtain the taxpayer funding necessary for advancing a sustainable flood management project that is consistent with the newly adopted Central Valley Flood Protection Plan (CVFPP) by protecting communities in your service area, improving recreational opportunities for Central Valley residents, and enhancing fish and wildlife habitat.

Our organizations fully support development of a flood protection project to protect communities in the project area. However, we are concerned that the DEIR has not fully addressed many issues and recommendations made in the scoping process (see e.g., American River's scoping and DEIR comments, attachments A and B). Among our concerns, is that the DEIR does not consider a reasonable range of alternatives, and more importantly, that the proposed project could increase long-term flood risk both for the communities in the project area and urban communities downstream along the Sacramento River. We look forward to working with you in the Feather River Regional Flood Planning process in the months ahead to better understand your agency's perspective on these issues and hopefully develop a common vision for a path forward that incorporates the multi-benefit flood management approach of the CVFPP.

In the near term, we are eager to work with you to expedite a "no-regrets" phase of the project that is necessary to improve flood protection for Yuba City without foreclosing long-term, sustainable and multi-benefit flood management projects that are essential to meeting California's public and natural resource management needs of the future. We would support a different alternative than those analyzed in the DEIR that would reduce long-term flood risk for communities in the project area, reduce long-term liabilities for the state and federal government, improve long-term water supply reliability for the State Water Project, improve water quality, and enhance fish and wildlife habitat. Specifically, our organizations request a robust analysis of a hybrid alternative that would involve fixing levees in place adjacent to urban areas, setting-back some reaches of the levee to attenuate flood flows, constructing low ring levees and drainage channels to route flood waters away from urban areas to the western and southern portions of the study area, and elevating structures in rural areas that would still experience

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shallow flooding under this hybrid approach. Because we believe a hybrid approach would better reduce long-term flood risk for area communities, achieve the multi-benefit objectives of the Central Valley Flood Protection Plan, and ultimately be a better use of taxpayer funding, our organizations do not support moving forward with the project as currently proposed in section 2.2.3 of the DEIR/DEIS.

American Rivers has reviewed the DEIR and notes that it does not adequately evaluate a range of alternatives, the growth inducing impacts of the project, the potential for the project to increase flood risk (as opposed to decreasing it), or consider the robustness of various alternatives to account for and adapt to a changing climate. The following is a summary of issues raised by American Rivers in more detailed comments regarding deficiencies in the DEIR and the FRWLP. We would like to discuss these issues with you in an effort to advance a robust, sustainable and cost-effective project.

O3-A 1. The DEIR/DEIS incorrectly concludes that "the project has no significant effect on growth" and therefore fails to adequately describe growth inducing impacts or identify measures to mitigate these impacts, such as consistency with the Sacramento Area Council of Government (SACOG) Sustainable Communities Strategy.

O3-B 2. The project increases long-term flood risk to local communities, downstream communities, and the state and federal government by facilitating development on a levee "protected" flood plain. The proposed project will ultimately lead to more development that would be extremely vulnerable to catastrophic flooding when the proposed 200 year levee is overtopped or fails in a major flood event.

O3-C 3. The DEIR/DEIS does not provide sufficient information to properly evaluate the impacts of the proposed project on flood risk, agricultural land, traffic, air quality, fish and wildlife habitat, and other resources.

O3-D 4. The DEIR/DEIS analysis regarding compliance with federal Executive Order 11988 regarding floodplain management is flawed as the project is not consistent with the purpose of EO 11988 to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative."

O3-E 5. The DEIR/DEIR does not adequately consider a reasonable range of alternatives that could better protect public safety and the environment as required by CEQA. All three project alternatives evaluated in the DEIR are limited to modifying a federal levee along its existing alignment. The DEIR does not adequately consider other approaches such as levee setbacks, ring levees, flood bypasses, reservoir reoperation, elevating vulnerable structures, or a hybrid combination of all of the preceding approaches.

O3-F 6. The DEIR fails to advance a multi-benefit approach and is therefore inconsistent with the Central Valley Flood Protection Plan.

O3-G 7. The proposed project and its long-term operation will impede public access to the Feather River due to levee district policy of blocking public access to the Feather River corridor along public right-of-ways.

O3-H 8. The project does not adequately evaluate flood management performance under climate change or future hydrologic changes associated with a warming climate.

O3-I 9. The DEIR does not evaluate the performance of the project alternatives in combination with foreseeable projects such as an expanded bypass along the lower Feather River and Sutter Bypass pursuant to the Central Valley Flood Protection Plan.

O3-J 10. The project does not evaluate the cumulative effects of the proposed project and associated flood control reservoirs on the fish and wildlife resources of the Feather River and its tributaries.

Many of the problems with the project and DEIR/DEIS could be avoided or mitigated through a more comprehensive flood risk management approach designed to advance a more sustainable flood management system consistent with the Central Valley Flood Protection Plan. Growth inducing impacts and associated

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increases in flood risk could be avoided through a combination of flood compatible land use management, agricultural conservation easements, building codes, and a robust emergency response program. Flood risk threats to downstream communities, project performance under climate change, and the lack of a multiple benefit approach could be resolved by a modified project design that utilizes a full toolbox of modern flood management strategies rather than a traditional levee focused approach.

Our organizations would like to work constructively with SBFCA and the USACE to expedite sustainable flood protection for the project area consistent with the Central Valley Flood Protection Plan, Executive Order 11988, and other applicable state and federal laws, plans, and policies. We believe that by working together we can develop a common vision that will better serve the taxpayers, and as a result, increase their willingness to invest in better flood management for the Central Valley.

Sincerely,

John Cain
American Rivers

Curtis Knight
California Trout

Diana Jacobs
Sacramento River Preservation Trust

Chandra Ferrari
Trout Unlimited

Dave Steindorf
American Whitewater

Mark Hennelly
California Waterfowl Association

Gary Bobker
The Bay Institute

Meghan Hertel
Audubon California

Monty Schmitt
Natural Resources Defense Council

Kim Delfino
Defenders of Wildlife

Ron Stork
Friends of the River

Jonas Minton
Planning and Conservation League

Caleb Dardick
South Yuba River Citizens League

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Attachment A to Letter O3

American Rivers
Rivers Connect Us

Detailed Comments on the Feather River West Levee Project DEIR/DEIS

Prepared by American River

February 15, 2013

The following detailed comments to the Feather River West Levee Project (FRWLP) DEIR/DEIS supplement the cover letter submitted by several conservation organizations. The comments are based on a review of the information in the DEIR/DEIS and publicly available information properly referenced in the documents. If the project design is based on information not included or referenced in the DEIR/DEIS, we would appreciate learning more about how this information and analysis influenced the proposed project.

1. **The DEIR/DEIS may erroneously conclude that "the project has no significant effect on growth" and therefore may fail to adequately describe growth-inducing impacts or identify measures, such as consistency with the SACOG Sustainable Communities Strategy, to mitigate these impacts.**

   American River's 2011 scoping comments (attachment B) asked SBFCA to consider whether providing a 200-year level of flood protection would increase, rather than decrease, flood risk by incentivizing development in flood-prone areas. Per state law, the DEIR/DEIS discusses whether the proposed project could "foster economic or population growth, or the construction of additional housing, either directly or *indirectly*, in the surrounding environment." Highlights from the DEIR/DEIS section include:

   - Significant growth (above the state average growth rate) is expected in Sutter and Butte County by 2050, but primarily in Yuba City and Live Oak. Sutter County's population is expected to triple to 280,000 people and Butte County's population is expected to double to 440,000 people. (page 4-4);
   - The DEIR/DEIS does not mention the SACOG Blueprint or Sustainable Communities Strategy in its review of "key development planning documents." (page 4-6);
   - The FRWLP would potentially remove "approximately 6,300 acres from the current officially mapped FEMA floodplain; however, only roughly 25% of this acreage (about 1,500 acres) is within areas planned for growth under the adopted municipal general plans." (page 4-8)
   - The DEIR/DEIS concludes, "The FRWLP has limited influence on such growth because the area that would be potentially removed from the floodplain that is currently planned for

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development is very small (approximately 1,500 acres of the 185,675 acres of the affected area or .8%). The FRWLP, therefore, has no significant effect on growth considering the magnitude of this change" (page 4-8 and 4-9).

Given the lack of discussion of the SACOG Blueprint and Sustainable Communities Strategy in the DEIR/DEIS, as well as ambitious plans for growth in Sutter County and Butte County, it is difficult to believe the FRWLP will not have growth-inducing impacts that are inconsistent with state and federal policies. While there is insufficient information in the DEIR/DEIS to evaluate the conclusion that the FRWLP will have no effect on growth, a review of the General Plans for Live Oak, Yuba City, and Sutter County indicates significant plans for additional growth in the FRWLP planning area. Furthermore, the Sutter-Butte Flood Control Agency states in one public outreach document that the levee improvement project would allow growth consistent with "state law and local policies." Some of this Sutter County growth is inconsistent with the SACOG Preferred Blueprint Scenario and SACOG Sustainable Communities Strategy, planning efforts for the Sacramento region that are consistent with both state and federal policies.[1]. The Sutter-Butte Flood Control Agency provided some additional information about the source of the growth-inducing impact estimates a few days prior to the comment deadline, but more information is necessary to fully evaluate the validity of the estimates.

Since the FRWLP is largely dependent on state funding to move forward, it seems reasonable to expect consistency of the project with state and federal policies, such as reduced greenhouse gas emissions, reduced flood damage liability, decreased vehicle miles traveled, and preservation of farmland and open space. According to the Engineer's Report for the assessment, "the most important assumption in the cash flow analysis is that all funded improvements are subject to state cost sharing." Given the need for at least a 75% match of state funding, it is essential the project ensure consistency with state and federal policies. As discussed below (section 4), alternatives to a levee-focused approach that include a broad set of flood management measures would deliver a more sustainable and resilient flood protection system. In addition, any growth that is allowed as a result of the FRWLP should be consistent with the SACOG Preferred Blueprint Scenario and Sustainable Communities Strategy. Any proposed mitigation for growth-inducing impacts should help ensure such consistency.

Examples of inconsistency with the SACOG Preferred Blueprint Scenario and Sustainable Communities Strategy include, but are not limited to:

Live Oak: Growth plans for the small community of Live Oak are clearly inconsistent with the SACOG Preferred Blueprint Scenario and the Sustainable Communities Strategy. According to the Live Oak General Plan (adopted in March 2010), the City plans to increase the population from 6,225 in 2000 to 45,000 to 53,000 in 2030. Most of this growth is planned for undeveloped

[1] The Preferred Blueprint Scenario promotes compact, mixed-use development and more transit choices as an alternative to low-density development. The Sustainable Communities Strategy is a plan to meet the region's greenhouse gas emissions reduction target, while taking into account regional housing needs, transportation demands, and protection of resource and farm lands based on the best forecast of likely land use patterns across all 28 local jurisdictions in the Sacramento region.

farmland. According to the preferred Blueprint scenario for Live Oak by SACOG, the vision is that "Live Oak grows at a steady, modest pace to a city of just over 16,000 people by 2050." SACOG's Sustainable Communities Strategy indicates no expected growth in the sphere of influence before 2035 because of the low regional growth forecast. In total, the Sustainable Communities Strategy 2035 forecast for Live Oak includes 848 new employees and 1,305 new housing units or around 10,000 people (assuming 8 units per acre). Approximately 97 percent of the housing growth forecast by the Sustainable Communities Strategy is in established communities and is largely building out many of the newer existing subdivisions. This forecast is clearly inconsistent with existing Live Oak General Plan. SACOG also identifies as an "issue to track" whether regional market pressures for Live Oak housing will return once the economy grows again and whether "the planned improvements to the levee system are constructed, as expected, by 2015."

Unincorporated Sutter County: The 2011 Sutter County General Plan describes ambitious plans for development in unincorporated Sutter County that appear to be inconsistent with the SACOG Sustainable Communities Strategy. The County plans development in new "rural communities", employment corridors, existing spheres of influence, and potential spheres of influence (Table 1 and Figure 1). Figure 1 shows how the Live Oak sphere of influence will grow all the way to the levee and a new "potential sphere of influence" would against the levees on the east and into the deep floodplain on the west. The SACOG Sustainable Communities Strategy, forecast includes 2,598 new employees and 4,157 new housing units in unincorporated Sutter County by 2035, most (3,475 housing units) of which are in the community of Sutter Pointe outside of the FRWLP planning area and the remaining housing units are allocated to established communities. The 4,654 acres of projected growth for the community of Sutter alone, on the other hand, would result in over 35,000 housing units (assuming 8 housing units per acre) not accounted for in the Sustainable Communities Strategy. It is also unclear whether the Sutter County General Plan projected growth in the Live Oak and Yuba City spheres of influence are consistent with the SACOG Sustainable Communities Strategy. The Sutter County General Plan also indicates the County has large plans for growth adjacent to Yuba City, particularly along Highway 99 south of Yuba City. It is unclear how much of this growth overlaps with growth accounted for in the Yuba City and Live Oak General Plans, as the Sutter County General Plan refers to the need to reach agreement with the cities regarding development.

It is also possible that the local governments could change zoning in the future, therefore increasing the project's growth-inducing impacts. Yuba City has not updated its General Plan since 2004, for example, and local governments in Sutter County and Butte County are not offering to restrict future growth in the planning area. Finally, even 1,500 acres of new development could result in significant population growth. Assuming 8 housing units per acre and 2.5 people per household, 1,500 acres would amount to 30,000 people. This represents a 50 percent increase in the population of Yuba City, currently at 64,000 people. Given these and other concerns described in these comments, additional information is needed to answer the following questions:

- How does providing flood protection to a 326 square mile areas (ES. 1.2) only remove 6,300 acres from the floodplain?

- How does the project only result in 1,500 acres of additional development when the General Plans for Yuba City, Live Oak, and Sutter County (not to mention Butte County) indicate proposals for significantly more growth?
- Where are the 1,500 and 6,300 acres located?
- How would floodplain management laws limit growth under the no action alternative compared to the proposed project?
- Do Sutter County and Butte County need to build additional houses to generate sufficient tax revenues to fund the local cost share for the project?

Table 1: Sutter County Projected Growth for Study Area*	Acres
Spheres of Influence (SOI)	
Live Oak SOI	6,511
Yuba City SOI	5,886
Possible Future Expanded Yuba City SOI	5,079
Subtotal—Spheres of Influence	**17,476**
Rural Planned Communities	
Sutter*	4,654
Employment Corridor	
North of Yuba City	599
South of Yuba City	548
Subtotal—Employment Corridor	**1,147**
Industrial/Commercial	367
Total	**24,791**

Source: Sutter County General Plan (2011)

Mitigation Measures
Growth inducing impacts of the proposed project could and should be mitigated by one or more of the following measures:

- Agricultural conservation easements to protect agricultural lands from urban development that would increase the risk of catastrophic flooding to life and property.
- Concentrate future growth in more compact developments designed to minimize loss of farmland, traffic impacts, and flooding hazards, consistent with the SACOG Sustainable Communities Strategy and Preferred Blueprint Scenario.
- Zoning restrictions and building codes to reduce the footprint and improve the flood resiliency of proposed development. Although SBFCA may not be able to impose these requirements, the local jurisdictions that will benefit from the project could impose these requirements in exchange for the millions of state and federal dollars that will be invested in this project.
- Growth inducing impacts could be avoided by substantially altering the flood protection strategy.

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CHAPTER 3: LAND USE
The Land Use Plan

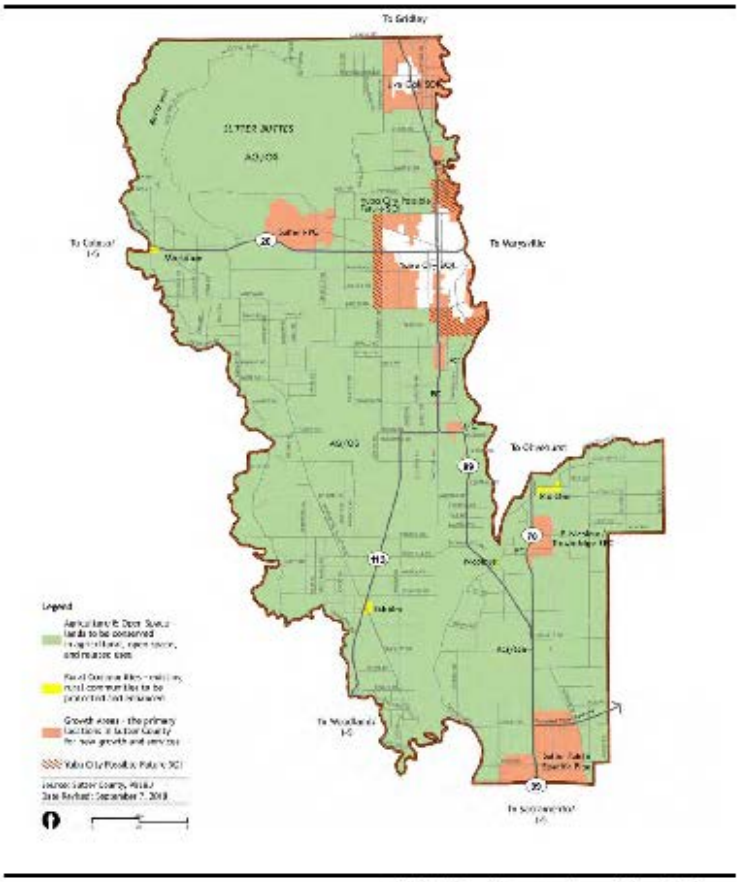

FIGURE 3-1 Conservation and Growth Areas

Figure 1: Sutter County General Plan. Note major expansion plans for Yuba City and Live Oak. These are already low density communities. More compact growth patterns would lower flood risk and reduce loss of agricultural lands.

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2. **The project may increase flood risk to local communities, downstream communities, and the state and federal government by facilitating development on a levee "protected" flood plain.** During the scoping period, American Rivers asked for these factors to be considered (Attachment B), but the DEIR/DEIS ignored or dismissed them.

   The project increases long-term risk to local communities by facilitating additional development in the project area. Over the long-term, this new development will be extremely vulnerable to catastrophic flooding when the proposed 200-year levee eventually fails. By definition, a 200-year levee has a 12% probability of failure over the course of a 30 year mortgage. Simply providing a 200-year-levee does not necessarily reduce risk and is therefore inconsistent with the primary objective of the Central Valley Flood Plan, which endeavors to reduce both the probability and consequences of flooding. Flood risk is the product of both the probability and consequences of flooding. Improving the levee in-place reduces the probability of failure, but facilitating growth will actually increase the consequences of flooding, thereby increasing the overall risk of flooding.

   Levees are not designed to withstand all foreseeable floods. When levees in the project area or in downstream areas fail, the state and federal government will be forced to spend billions on flood relief, as occurred during Hurricanes Katrina and Sandy, or to simply abandon the affected communities. Either way, the consequences for the state and federal taxpayers and economy will be devastating.

   The project increases flood risk for downstream communities, particularly in metropolitan Sacramento, by increasing the probability that extreme floods will be routed downstream. Reinforcing the levees in the project area will reduce the probability of levee failure in the project area, and flood waters that would be routed into rural basins under the no action alternative will routed downstream where tens of thousands of people live in deep floodplains along the Sacramento River.

   The DEIR/DEIS claims, but provides no evidence, that the proposed project would not cause increased flows, stage, and velocity in downstream areas during extreme events. A proper and legally required hydraulic analysis showing how the project would perform relative to the no-action would show the existing levee breaching during a 100 or 200 year event under the no-action. Comparison of this levee breach scenario with the proposed project specifically designed to reduce the probability of levee breach would show that more water moves downstream during extreme events under the proposed project.

   In the absence of any proper hydraulic analysis supporting the contention that the project has no downstream hydraulic impacts, the DEIR/DEIS simply refers to misconstrued or misguided state policies in the following paragraph to arrive at the conclusion that the project has no downstream impacts:

   > "Furthermore, these improvements would be consistent with the principles that have guided the management of the SRFCP over the past century and with the policies adopted by the state legislature calling for an immediate and comprehensive effort to

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> increase the level of flood protection provided to the region in the SRFCP area. Finally, the CVFPB resolution adopting the CVFPP (Resolution No. 2012-25) states that . . . the Board has consistently found that no adverse hydraulic impacts are associated with levee strengthening projects that do not change the alignment or height of the levee, or the cross section of the channel and overflow area.
>
> Alternative 1 would therefore have no effect related to changes in water surface elevations and flood safety. Mitigation is not required. (pg. 2.1-20, 21)"

General state policy or practice does not provide a reasonable basis for ignoring the impacts of a specific project and do not supersede the requirements of NEPA and CEQA to document the impacts of specific projects. Moreover, the DEIR/DEIS analysis and deference to state policy and precedent is flawed in a number of ways. The claims that improvements are consistent with the principles that have guided the management of the SRFCP over the past century are unsubstantiated and at least partially untrue. There is a very long history of litigation and "levee wars" regarding the adverse effect of one landowners levee repair on another landowner's property, which are documented in the book Battling the Inland Sea.

The appeal to the state legislature's activities is equally flawed. Laws passed by the state legislature do call for an increased level of flood protection, but they don't require that it be done by improving levees in place in a manner that will increase downstream flood risk. To the contrary, they provide for a comprehensive approach that involves both "structural and nonstructural means for improving the performance and elimination of deficiencies of levees, weirs, bypasses, and facilities, including facilities of the State Plan of Flood Control ." They then enumerate a long list of objectives (which does not explicitly mention "levee improvements"), including expanding the capacity of the flood protection system in the Sacramento-San Joaquin Valley, to either reduce flood flows or convey floodwaters away from urban areas, reduce damage from flooding, and identify opportunities and incentives for expanding or increasing use of floodway corridors. As discussed in the alternatives section below, this project simply ignores these elements of the flood legislation in favor of a levee focused project.

It is true that the CVFPB resolution adopting the CVFPP stated that "nothing in the CVFPP . . . is intended to change the Boards practice for evaluation of hydraulic impacts. Under this practice, the Board has consistently found that no adverse hydraulic impacts are associated with levee strengthening projects that do not change the alignment or height of the levee," but this acknowledgement is not an endorsement of past practice or an application to the FRWLP. It simply says that the plan is silent on this subject. It might have made sense for the board to make such a determination in the past where the action before them involved repair of a short segment of levee, but does it make sense when the repair involves substantially upgrading 41 miles of levee? Lastly, any casual observer of California flood management policy realizes that past practice is not necessarily good practice today. In fact, a troubled history of bad policy along with changing land use and climactic conditions prompted the legislature to pass and the governor to sign major legislation that dramatically reformed the CVFPB.

Despite the language of CVFPP (Resolution 15), the State System wide Investment Approach (SSIA) described in CVFPP is in fact an acknowledgement that repairing all upstream levees to the DEIR/DEIS original design capacity for both rural and urban areas is neither affordable nor desirable. It found that increasing repair to upstream levees to original design capacity without increasing levee height would increase stage by 1.2 feet in Sacramento, which is very significant. The SSIA instead opted for a strategy. If the CVFPP determined that fixing levees upstream would increase downstream flood stage, why would the proposed project be any different?

Mitigation Measures
Increases in flood risk associated with the project could be avoided or mitigated with some of the following measures:

- Increases in flood risk in the study area could be avoided by acquisition of agricultural easements or zoning restrictions, particularly on deep flood plains, to prevent development on deep floodplains.
- Increases in flood risk in the study area could be avoided, particularly in shallow floodplains, by instituting building codes requiring all new development to be constructed above the base flood elevation.
- Increases in downstream flood risk could be mitigated by modifying project design to maintain transitory storage in the study area or elsewhere.

3. **The DEIR/DEIS does not provide sufficient information for reviewers to evaluate the impacts of the proposed project.** Without this information, reviewers and decision makers may not be able to accurately evaluate the adequacy of the DEIR/DEIS or the value of the project.

   Information on basic hydraulic studies is also not available in the DEIR/DEIS or any of the documents properly referenced in the document. The document does not provide a map showing the level of protection that will be provided by the project. Project proponents must have this information. The floodplain inundation maps (plates 2-14 thru 2-19) cite Peterson Brustad, 2012 as the source, but no description or reference for this document is provided in the entire DEIR/DEIS. These documents and plates 2-14 thru 2-19 divide the various reaches into six different segments for the purpose of the underlying hydraulic analysis, but these segments are different than the 37 different study reaches. These hydraulic analyses are foundational to the flood performance and design of the project, but without proper references and documents, it is impossible to align the six "segments" which formed the basis of the underlying hydraulic analysis with the 39 "study reaches" described in the DEIR/DEIS. Aside from Plattes, 2-14 thru 2-19, the following statement from page 1-9 of the Executive Summary is the only reference in the DEIR/DEIS to the segments:

   > "Note: Certain planning and engineering studies for the project make reference to segments within the planning area under which the reaches above are grouped. These segment designations do not have substantial bearing on the alternatives descriptions,

environmental setting, or determination of effects and therefore are not used in this document for simplicity."

This statement is incorrect. The underlying hydraulic analysis reported using the segment system is foundational to alternative formulation and justification. It is impossible to evaluate which levee segments must be fixed to protect Yuba City from deep flooding. Project proponents at SBFCA did not provide the proper reference documents or citations even after we made a special request before the end of the comment period.

Mitigation
This deficiency could be remedied by reissuing the DEIR/DEIS to provide information addressing the deficiencies described above including the provision of specific maps delineating the parcels that will be removed from floodplain and susceptible to urban development as a result of the project.

4. **The DEIR/DEIS analysis regarding compliance with Executive Order 11988 regarding floodplain management is flawed.** The project appears to be in violation of Executive Order 1198, which is attached. The DEIR/DEIS explains that:

   "E0 11988 requires a Federal agency, when taking an action, to avoid short and long-term adverse effects associated with the occupancy and modification of a floodplain, and it must avoid direct and indirect support of floodplain development whenever there is a reasonable and feasible alternative. "

   Section 4.1.2.1 of the DEIR/DEIS argues incorrectly that there are not reasonable or feasible alternatives. As discussed in more detail below the DEIR/DEIS did not sufficiently evaluate other alternative designs that could "avoid direct or indirect support of floodplain development.

   The project entails modification of a federal levee and will require a 408 permit from the Unites States Army Corps of Engineers (USACE) under the Rivers and Harbors Act of 1908. It is not realistic to assume that USACE will disregard EO 11988. As a result, the project proponents decision to screen out other alternatives will risk delaying implementation of badly needed flood protection improvements for the project area. Flood protection for existing communities and structures in the project area could be expedited by implementing the mitigation measures identified in sections 1 and 2 above or by considering a broader range of alternatives.

5. **The DEIR/DEIS does not adequately consider a reasonable range of alternatives that could better protect public safety and the environment as required by CEQA.** All three project alternatives evaluated in the DEIR/DEIS are limited to modifying a federal levee along its existing alignment. The DEIR/DEIS does not adequately consider other alternatives such as levee setbacks, ring levees, flood bypasses, reservoir reoperation, or elevating vulnerable

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structures. The DEIR/DEIS fails to adequately consider several critical and viable alternatives, including those identified in the initial project scoping period (Attachment B).

Section 2.7 describes the screening process that proponents used to screen-out various flood management approaches such as set-back and ring levees, but the assumptions and information utilized in this screening process are flawed, and more importantly, the screening process did not consider any hybrid alternatives comprised of a broad toolbox of approaches. Failure to consider an alternative that considered more than one approach led the proponents to discard approaches simply because one single approach was not sufficient to provide protection in the view of the proponent. It is worth noting that the recommended alternative uses a hybrid approach that relies on both seepage berms and slurry walls. Would it have been reasonable to discount one of these two approaches simply because anyone of these two approaches by themselves would have been insufficient?

The underlying hydrology and hydraulic analysis that this screening analysis is based upon is not referenced in the DEIR/DEIS making it difficult to evaluate the performance of alternatives screened from the analysis. From discussions with SBFCA staff during the comment period, we learned that screening analysis was based in part on analysis conducted in 2010 as part of the "study area plan" prepared by Peterson Brustad, but this analysis was not presented as part of the DEIR/DEIS, was not referenced in the DEIR/DEIS, and is not publicly available. We were only able to obtain a copy of this document two days before the end of the comment period and are currently reviewing it. It does provide some overly simplistic analysis of ring levees, J levees, and a flood bypass; but it does not consider other flood management approaches such as zoning, building codes, and flood insurance. Moreover, it appears that the underlying hydraulic analysis did not assume the existing TRLA setback on the left bank or potential levee setbacks downstream in combination with the approaches screened. Due to the lack hydraulic information, we were unable to evaluate the validity of the screening analysis. We look forward to learning more about this analysis in future discussions with the project proponent.

Many of the problems with the project and DEIR/DEIS could be avoided or mitigated through a more comprehensive flood risk management approach designed to advance a more sustainable flood management system. As illustrated in the following figure and described in the attached paper by Major General Don Riley (Attachment C), a previous director of Civil Works for the Army Corps of Engineers, levees are only small part of what is necessary to protect communities from flooding. Failure to consider a hybrid approach results in a defective project and DEIR/DEIS.

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We therefore request that the DEIR/DEIS and the underlying project description be substantially revised to identify and consider a comprehensive alternative that utilizes multiple approaches for improving flood protection for the project area. A hybrid approach could better reduce long-term liabilities for the state and federal government, reduce long-term flood risk for communities in the project area, improve long-term water supply reliability for the State Water Project, improve water quality, and enhance fish and wildlife habitat. Our organizations would support a hybrid alternative that would involve fixing levees in place adjacent to urban areas, setting-back some reaches of the levee to attenuate flood flows, constructing low ring levees and drainage channels to route flood waters away from urban areas to the western and southern portions of the study area, and elevating structures in rural areas that would still be vulnerable to shallow flooding under this hybrid approach.

Levee Setbacks

The screening process uses the following three arguments to remove setback levees from further consideration: 1) incompatibility with existing land uses, 2) environmental impacts of levee setbacks, and 3) relative cost of levee setbacks (FRWLP 2.7.2.1). We provide detailed comments on these three lines of reasoning below:

- The document cites poor compatibility with land use due to the potential for conversion of existing agricultural, commercial, and residential land, and for subjecting additional lands to flooding as a reason for screening out setback levees as a feasible alternative. New floodplain associated with setback levees is not *de facto* removed from agricultural uses. To the contrary, the majority of the land currently in the floodway is farmed, and

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much of it is in perennial tree crops. Even if setback levees removed land from agricultural production, setbacks should be considered for the DEIR/DEIS public safety benefits. According to an analysis conducted for SBFCA and the USACE, levee setbacks in or near the project area would substantially reduce flood stage and velocity, and presumably the risk of levee failure. Lastly, this consideration fails to consider the value to water quality and fish and wildlife that would result from setback levees, effectively ignoring significant environmental benefits of levee setbacks.

- The document cites concerns for environmental effects on land use, mineral resources, transportation, air quality, noise, and other resources as a reason for screening out setback levees as a feasible alternative. Effects on mineral resources and transportation are unsubstantiated in the document, and seem very unlikely. Effects on air quality, noise and "other resources" would be short term in nature, and not likely to be much greater than those associated with the recommended alternative, or the growth facilitated by the alternative. In the long-term, setback levees would improve air quality, and would reduce noise impacts on wildlife and recreational river users by increasing the natural buffer between the river and surrounding sources of noise pollution. The long-term benefits to public safety, river health, fish and wildlife habitat, and recreation greatly outweigh any immediate, short-term impacts associated with the construction of setback levees.
- The document cites concerns for the cost of setback levees relative to other alternatives considered. No supporting information is provided in the document regarding cost estimates, how they were calculated, or if they were quantified at all. However, in a previous document titled Pre-Design Formulation Report on the FRWLP, segments 1 to 7, the costs of using setback levees is compared to that of *in situ* levee improvements (included in Appendix B). The criteria for consideration of setback levees as an alternative was a cost ratio of less than 5:1 (setback levee: *in situ*). One scenario for the considered segment was found to be at a ratio of 3:1. While other setback alternatives had a higher ratio, it appears that the cost of levee setback was exaggerated due to unrealistically high land cost estimates. The analysis assumes land costs of $25,000 per acre, but the costs of agricultural land is significantly less.

Setback levees are not suitable options in all circumstances, but setback levees in selected locations require further consideration as a project alternative, or as additional measures in the considered alternatives. Many segments of the project reach are strong candidates for setback levees, and ultimately, the recommended alternative should not be without setback levees as a central part of the overall project. Inclusion of setback levees would be complimentary to other Feather River projects such as the planned floodplain augmentation at the Oroville Wildlife Area, and the Feather River Setback Levee at Star Bend, and could together create unprecedented benefits for the watershed through improvements in public safety, fish and wildlife habitat, and recreational opportunities.

These benefits of setback levees and other alternatives become especially important in light of the predicted effects of climate change for the region as discussed below. Peak flows are expected to occur earlier, rain-on-snow events and the DEIR/DEIS associated extreme flooding are expected to occur more frequently, and more precipitation is expected to fall as

rain instead of snow through the winter. These factors will complicate the management of reservoirs for multiple benefits and decrease the predictability of high flow releases, making the adaptive capability of the greater floodplain area associated with setback levees increasingly valuable in the future.

Ring Levees

Ring levees and all variations of the ring levee concept are excluded on the basis that they fail to protect the entire reclamation district from 200 year flood protection, but based on discussion with SBFCA staff it is our understanding that the recommended alternative does not provide 200 year protection for the entire area. The following language from table 2-21 explains why ring levees were excluded from further consideration:

> "Fail; ring levee(s) may achieve 200-year protection for the area within the ring (or areas within multiple rings) but would not address the project objective to reduce flood risk for the entire planning area. The vast majority of the planning area would remain at current or heightened risk levels, especially agricultural communities, commodities, and infrastructure."

This preceding statement is problematic for a number of reasons. It is based on a misunderstanding of the definition of flood risk and neglects to consider the role that other risk management measures could play to reduce flood risk for the entire study area in combination with a ring levee approach. Risk is quantified by multiplying the probability of flooding by the consequence of flooding. By definition, ring levee that protect urban areas reduce risk for the entire area by reducing the probability of flooding in urban areas where the consequences of flooding would be greatest for the entire study area. Furthermore, ring levees in combination with other measures could reduce risk for areas outside of the ring levees. For example, elevating structures in shallow agricultural floodplains or providing flood insurance for less protected areas would also reduce flood risk.

Ring levees protect urban areas by routing flood waters to other locations. There are many potential variations of ring levees or cross levees in combination with drainage swales that could route flood waters away from urban areas in the service area. For example a low cross levee combined with a drainage swale created immediately north of Yuba City could route flood waters around Yuba City and into the low lying western and southern areas of the study area. Although this approach would not provide the same level of flood protection for the rural areas north of Yuba City, it would also not require routing all floodwaters downstream toward Sacramento for the purpose of protecting Yuba City. As a result, it would not transfer flood risk from upstream areas to downstream areas, a problem discussed in section 2.

J Levees

A J-levee is a special hybrid of repair-in-place of existing levees and ring levees, with the "J" referring to the shape of the levee in planform. Rather than entirely encircling a limited area like a ring levee, a J-levee would combine repair-in-place of existing levees connected with a partial ring levee(forming the "J" shape). Table 2-22 eliminates a J levee from further consideration for the following reason:

> "Uncertain; a J-levee may need further evaluation to determine ability to meet the project objective to reduce flood risk for the entire planning area."

If more evaluation is necessary to determine if a J-levee could meet the project purpose, why was it excluded from further evaluation?

Reservoir Reoperation and Flood Bypasses
Reservoir reoperation and flood bypasses were excluded because they were outside of the jurisdiction of the project proponent. This may be a reason for the project proponent to exclude this measure from further consideration, but if the state and federal government is paying for 80% or more of the project, is not a legitimate reason for them to exclude it from further analysis.

Raising Building Pads
Raising building pads was excluded from further analysis with the following language from table 2-26:

> "Fail; raising building pads would not meet the objective to reduce flood risk for the entire planning area because approximately 30,000 existing structures would need to be modified which is not reasonably feasible and because tens of thousands of acres of agricultural lands would remain at risk."

The reasoning from the preceding statement is fundamentally flawed and no data is presented to show that it is actually cost prohibitive. Raising building pads to one foot above BFE would in fact substantially reduce flood risk, if not eliminate it for all structures. No data is presented on exactly how many structures exist in the planning area and how many would need to be elevated. Most historic structures are elevated above ground level because early residents knew that doing so was prudent. It may not be feasible for the entire planning area, but it could play a substantial risk reduction role in large areas of the planning area. Lastly, while it is true that raising building pads would not reduce probability of flooding for agricultural lands, but the consequences of temporary flooding on agricultural lands is relatively low compared to urban flooding in other parts of the state. The state and federal taxpayers are not inclined to spend millions or billions of dollars to protect agricultural lands from very infrequent flood events.

6. **The DEIR/DEIS fails to advance a multi-benefit approach and could preclude future multi-benefit projects along the Feather River, which would be inconsistent with the Central Valley Flood Protection Plan.** We are particularly concerned that building the proposed project would foreclose any opportunities to restore floodplain habitat in the Feather River floodway. Floodplain restoration is essential to restoring habitat for endangered salmon and other fish and wildlife species. Protection and restoration of endangered salmon runs is necessary to comply with the state and federal Endangered Species Act. Failure to restore salmon populations could severely affect the State Water Project, which provides water to tens of millions of Californians. Once the project is built, it will be difficult if not impossible to obtain permits for floodplain restoration projects that locally increase flood elevations

even slightly. We have no assurances that the project proponent or other local entities would not litigate to stop any project with even minor hydraulic effects.

At the direction of the state legislature, the Department of Water Resources spent four years and large amounts of money preparing the Central Valley Flood Protection Plan (CVFPP) to meet a variety of flood management and ecological objectives enumerated in section 9616 of the California water code (attachment C). The plan includes a number of objectives including promoting ecosystem function and multiple benefit projects. The Central Valley Flood Protection Board amended and adopted with CVFPP with a board resolution that requires development of multi-benefit projects. Resolved 11(m) states:

> "Wherever feasible, improvements to the SPFC should be implemented in accordance with CWC § 9616 and provide for multiple benefits through projects designed to improve public safety while achieving other benefits, such as restoration of ecosystem functions and habitats within the flood management system."

By the DEIR/DEIS own acknowledgement, the project proponents have made no attempt to design the project to meet multiple-benefits or restore ecosystem function. The project proponents expect to obtain well over $100 million in state funds to construct the project, but it is not clear why the state should support the project without assurances that the project proponents will support multiple benefit projects along the Feather River once the DEIR/DEIS project is completed.

7. **The proposed project will continue levee district policy of blocking public access to the Feather River corridor, a public trust resource.** The DEIR/DEIS recognizes that there is demand for increased recreational and public access opportunities on the Feather River within the project area, but existing practices by the SBFCA or its member agencies prevent the public from accessing the Feather River along public right-of-ways.

   Access to the Feather River from the dry side of the levee is obstructed by the levee, a man-made barrier predating this project but related to it. It is illegal to climb the levee other than at ramps, because climbing the unprotected bank of the levee may cause erosion and damage the levee. This obstruction of access to the river and its banks is mitigated by the presence of ramps providing a means of crossing between the lands on the wet side of the levee and lands on the dry side of the levee. These ramps are currently obstructed by gates which are almost always maintained locked closed by levee maintenance organizations (Department of Water Resources (DWR), Levee District Number One of Sutter County (LD1), Levee District Number Nine of Sutter County (LD9)). Each of these entities is a California public agency. DWR is an "authorizing stakeholder" in the project, and LD1 and LD9 are constituent parties to the Sutter Butte Flood Control Agency joint powers agreement. The levee, gates and the practices of maintaining the gates locked closed are pre-existing facts which must be considered a cumulative with the effects of this project. The pre-existing practice of keeping the gates locked closed is a good indicator that the levee maintenance organizations will keep the gates locked closed after the project is completed, which also must be considered as a cumulative effect of the project.

Levee District 1 in Yuba City area has consistently locked gates and restricted access to the river despite complaints from the public. Roads that connect Highway 99 and other main arteries to the river were authorized by the Sutter County Board of Supervisors as public thoroughfares to the river in the mid-1800s. These roads are maintained by the County. In the last ten years, farmers have installed "No Trespassing" signs, and in some cases, gates or other obstacles that discourage public access to these public roads. LD 1 has permanently locked a gate across a public road at Star Bend. The County Public Works Department has been reluctant to remedy the situation by demanding that access to the public be kept open.

The public has the right to access and use the river and the adjacent dry land below the high water mark, and state and local agencies have an obligation to avoid impinging on this right. We are concerned that FRWLP will decrease options for public access through removal of levee ramps or maintaining the practices of maintaining locked gates. The DEIR/DEIS does not adequately address impacts to recreation and public river access. The DEIR/DEIS provides no assurances that SBFCA will seek commitment from its member agencies to improve upon past policies and practices, and allow public access to the river and floodplain to the maximum extent feasible. More detailed comments on recreation and public access were provided by Francis E. Coates, which we incorporate in these comments by reference.

In addition to the indirect consequences of this project on access to public recreational resources, the construction of new flood facilities could directly impede public use. The DEIR/DEIS states in Chapter 3.14 that "Seepage and stability berm installation in Alternative 3 could affect the long-term access to portions of the Oroville Wildlife Area, O'Connor Lakes Unit and Nelson Slough Unites of the Feather River Wildlife Area and the Bobelaine Audubon Sanctuary. The new topography on the approach side of the these facilities may requires the construction of new roadway and trail access, utilities, parking, staging and other facility or infrastructure improvements. With the implementation of the environmental commitment requiring reconstruction of affected formal park facilities and preservation of boat launch access during and following construction activities (described in Chapter 2, Alternatives), this effect would be less than significant. No mitigation is required." We were unable to find any such "environmental commitment" to reconstruct formal park facilities and preserve boat launch access in the referenced section. Moreover, even if there were such a commitment made, there is little assurance that the level of access presently available to the public through informal access and by means of other facilities beyond "formal park facilities" and boat launches would not be impaired by this project.

8. **The project does not adequately evaluate performance under climate change or future hydrologic changes associated with a warming climate.**

The final engineers report for the Sutter Butte Flood Control Agency by Parsons Brinkerhoff (July 14, 2010) provides the following description of changing hydraulic conditions, but the

DEIR/DEIS does not provide an analysis of how the project will perform under anticipated hydrologic conditions.

> "California weather is changing, perhaps as a result of global climate change. More precipitation is falling in the mountains as rain, and less as snow pack. This change will increase the stress on the region's flood control system."

Despite this acknowledgement, the project does not provide any analysis of how the project will perform under a changing climate and does not appear to utilize climate change hydraulics and hydrology to evaluate project alternatives. An analysis that considered the high probability of climate change would very likely reach different conclusions regarding the merits of various flood management approaches, all of which were screened-out of the alternatives analysis.

These benefits of setback levees and other alternatives become especially important in light of the predicted effects of climate change for the region. Peak flows are expected to occur earlier, rain-on-snow events and the DEIR/DEIS associated extreme flooding are expected to occur more frequently, and more precipitation is expected to fall as rain instead of snow through the winter. These factors will complicate the management of reservoirs for multiple benefits and decrease the predictability of high flow releases, making the adaptive capability of the greater floodplain area associated with setback levees increasingly valuable in the future.

9. **The DEIR/DEIS does not evaluate the performance of the project alternatives in combination with existing and foreseeable projects that have or will expand flood carrying capacity in the lower Feather River, such as an expanded bypass along the lower Feather River and Sutter Bypass.**

   The study plan hydraulic analysis (Peterson Brustad, 2010), which purportedly forms the basis for the underlying alternatives analysis, including the alternatives screening analysis described in section 5 above, does not include the TRLA set-back project as part of the base case. The TRLIA set-back project reduces flood stage elevations by six inches, which is very significant. Furthermore, the hydraulic analysis used to screen-out several alternatives does not consider the synergistic effects of downstream levee setbacks that are planned for in the CVFPP. A July 2011 analysis of Lower Feather River set-back levees found that a setback downstream of Laurel Road could lower flood stage elevations in the lower Feather River by one to two feet in the vicinity of Yuba City. This is very significant, especially since inundation depths in most of Yuba City under several breach scenarios (depicted in plates 2-14 to 1-19) are less than two feet. How would various scenarios that were screened-out using other hydraulic assumptions (Peterson Brustad, 2010) such as levee set-backs, ring levees, and raised build pads perform differently if the hydraulic analysis had assumed a major levee setback downstream of Laurel Road? To provide a credible alternative analysis and to qualify for state funding, the project proponents should reconsider how various alternative approaches would perform assuming a major levee set-back in the lower Feather River as proposed in the CVFPP.

10. The project does not evaluate the cumulative effects of the proposed project and associated flood control reservoirs on floodplain habitats and the fish and wildlife resources of the Feather River and its tributaries.

The system of dams, levees, canals on the Feather River and the urban and agricultural they support in the study area have contributed to the precipitous decline of fish and wildlife resources. Spring-run salmon on the Feather River are endangered and fall-run salmon are greatly reduced. The decline of these fisheries has imposed severe hardship on commercial fisherman and deprived recreational anglers of a value past time and food source. Salmon and other fisheries like the Sacramento Splittail are dependent on inundated floodplain habitat for reproduction or nursery habitat. Floodplains are also a source of primary and secondary productivity for a number of other fish and wildlife species.

Oroville Dam, project levees, particularly in the lower portion of the study reach, agriculture in the flood way, historical dredging activities, and local berms constructed to reduce the frequency of agricultural land in the floodway have all contributed to the decline of floodplain habitat, and by extension, fish and wildlife dependent on those habitats. Modern perennial agriculture (orchard) in the floodway is only possible because of the regulation of the Feather River by Oroville Dam and the state water project, which has further reduced the area and frequency of inundated floodplain habitat.

The same can be said for terrestrial and avian species, particularly migratory birds. The river floodplains historically provided wetland habitat for millions for ducks, geese, swans, and other waterfowl that evolved to over-winter in the Central Valley, particularly in the Sacramento Valley. Those wetlands were reduced to below 5% of the DEIR/DEIS historical extent due to the construction of levees and other land use changes. An important recreational resource and industry is now dependent on artificially flooded lands and subject to the uncertainties of water supply, electricity prices, farm practices and government appropriations to sustain them.

There is clear scientific evidence documented in several peer reviewed scientific studies that restoration of floodplain habitat would substantially improve fisheries populations. Some of these fish populations are endangered, which may require extraordinary measures by the state water project, to release substantially more water during the spring for the purpose of increasing the frequency of inundated floodplain habitat. Alternatively, floodplain habitat could be restored with considerably less water by reconnecting floodplains and secondary channels in the Feather River floodway that are currently blocked by small levees or berms or by increasing the elevation of the channel thalweg where it was previously dredged. These manipulations in the floodplain, however, would by design increase water surface elevations at least for moderate flood events. As discussed in section six above, we are concerned that the project proponents or other parties will litigate to prevent future floodplain restoration once the DEIR/DEIS project has been built on the technical grounds that such floodplain restoration would increase water surface elevations during floods. Although, it is not necessarily true that floodplain restoration would increase water surface elevations during large flood events, opponents to such restoration could preclude it indefinitely with legal arguments that it would compromise public safety.

The proposed project to build the levee in place does not create any additional flood conveyance capacity and therefore any future efforts that could conceivably decrease flood conveyance would be viewed by local, state, and federal flood management agencies as an impact to public safety that must be mitigated. As discussed above, the project would facilitate additional urban development in the levee "protected" floodplain increasing the public safety imperative and thus aggravating the perceived, if not real, conflict between public safety and fisheries restoration. The very best way to protect public safety, particularly against the increasing storms that climate change will bring, is to give the river more room to safely convey flood flows. Giving the river more room also allows for other uses of the floodplain such as recreation, trails, wetlands that filter and cleanse water, and fish and wildlife habitat.

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Attachment B to Letter O3

July 5, 2011
Feather River West Levee Project
American Rivers Comments

July 5, 2011

Ingrid Norgaard, Project Manager
Sutter Butte Flood Control Agency
c/o ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Dear Ms. Norgaard,

American Rivers, in its commitment to river conservation, public safety, and sustainable flood management, would like to offer comments with respect to the proposed Feather River West Levee Project (FRWLP). It is American Rivers' concern that the project, as currently proposed, fails to incorporate long-term, sustainable flood management strategies, and places both human and natural communities at increased risk of future catastrophic flooding.

The project's EIR/EIS should examine a broad range of issues and mitigation alternatives in order to formulate a more comprehensive and sustainable approach to flood management in the Sutter/Butte region, as described below.

Growth Inducing Impacts
The report should consider whether providing 200-year flood protection from Thermalito Afterbay to Yuba City north would increase, rather than decrease, flood risk by incentivizing development in these flood-prone areas. Flood risk, as defined by the state of California, equals the probability of flooding multiplied by the consequences of a flood. Although the project will reduce the *probability* of local flooding, the *consequences* of eventual flooding in a heavily developed community would be much more severe. Facilitating development efforts by cities, counties, and property owners in flood-prone regions may substantially increase flood risk over the long term.

Downstream Flood Impacts
In its emphasis on structural levee improvements, the proposed project could route more floodwater downstream to urban communities. By reducing the probability of levee failure in the Yuba City area during a large flood event, the project would necessarily increase the probability that flows would be routed downstream, and this would increase the risk of catastrophic flooding in Sacramento and West Sacramento. The report should consider and select alternative improvement measures that would avoid or mitigate these impacts.

Impacts Under Climate Change
The project should consider whether the proposed levee improvements will actually provide 100-year and 200-year protection under projected future flows assuming climate change.

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July 5, 2011
Feather River West Levee Project
American Rivers Comments

Evaluate a Broader Range of Alternatives
In order to better advance the state and federal flood management goals, the EIR/EIS must evaluate a broader range of alternatives including:

1. **Levee Setbacks**: Evaluate the potential benefits of levee setbacks, including reduced operations and maintenance costs, improvements to local flood protection in the face of climate change, and benefits for fisheries and wildlife habitat.
2. **Ring Levees and Building Modifications**: Examine the potential that ring levees offer for protecting the existing communities of Gridley, West Gridley, Biggs, and Yuba City as an alternative to the proposed project. Elevate buildings outside the ring levees to protect against flooding.
3. **Flood Bypass**: Evaluate the opportunity to reduce peak flows during extreme flood events by rerouting floodwaters into the Butte Basin through a new flood bypass. Such a bypass could divert water out of Thermalito Afterbay and the Feather River and into the Cherokee Canal.
4. **Oroville Reservoir**: Consider opportunities for reducing extreme flood events by reoperating the Oroville reservoir either to expand the flood reservation or improve real time operations during flood events.
5. **Oroville Wildlife Area Levee Modification**: Explore opportunities for reducing peak flood flows through planned modifications to levees adjacent to the Oroville Wildlife Area that would increase flooding of the OWA. Modifying levees along the OWA is required by Article A106 Riparian and Floodplain Improvement Program in the Settlement Agreement for the Relicensing of the Oroville Facilities, FERC Project 2100, executed by the Department of Water Resources and 52 other parties in March 2006.

The costs and benefits of all alternatives should be evaluated in light of the life cycle costs of maintaining and operating the project.

By examining the aforementioned potential project impacts and considering additional mitigation alternatives, the FRWLP can adopt a sustainable flood management vision and offer long-term public safety as well as ecological benefits to the communities of the Sutter/Butte region.

We hope that, in compiling the EIR/EIS and in moving forward with the project, the Sutter Butte Flood Control Agency and its collaborators will consider our comments and be part of the movement towards a safer, more sustainable future for California's Central Valley.

Respectfully,

John Cain,
Director of Conservation
California Flood Management

Megan Randall,
California Flood Management Fellow

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Attachment C to Letter O3

2/26/2008

**IMPROVING PUBLIC SAFETY –
FROM FEDERAL PROTECTION TO SHARED RISK REDUCTION**

**Major General Don Riley
US Army Corps of Engineers**

Responsibility for flood risk management in the United States is a shared responsibility between multiple Federal, State, and local government agencies with a complex set of programs and authorities. Nationally, both the US Army Corps of Engineers (USACE) and the Federal Emergency Management Agency (FEMA) have programs to assist states and communities in reducing flood damages and promoting sound flood risk management. The authority to determine how land is used in floodplains and to enforce flood-wise requirements is entirely the responsibility of state and local government. Floodplain management choices made by state and local officials, in turn, impact the effectiveness of federal programs to mitigate flood risk and the performance of federal flood damage reduction infrastructure. One key challenge is to ensure that as the public and government leaders make flood risk management decisions, they integrate environmental, social, and economic factors and consider all available tools to improve public safety. Importantly, we must ensure the public is educated both as to the risks they face and actions they can take to reduce their risks. Because of this complex arrangement of responsibilities, only a life-cycle, comprehensive and collaborative systems approach will enable communities to sustain an effective reduction of risks from flooding.

Where we are now – "The government will protect us"

Individual agency processes and procedures typically have provided the venue for planning and implementation of flood damage reduction measures. The present process to engage the Corps of Engineers is on a project by project basis, even though the Corps has made advances in incorporating collaborative approaches and assessing alternatives in a watershed context. Traditionally, the Corps focuses on reducing flood damages by managing floods that cause damage largely by decreasing the probability of flooding. The Corps develops alternatives based on reducing known potential flood damages, with minimal consideration of future land use or other social effects. Additionally, the Corps infrequently assesses options to reduce consequences should a failure occur. Whether communities strive for 1% level of protection or greater, the present process drives decisions based on reducing the potential for failure or *reducing flood damages* and does not incorporate an assessment of localized risks and consequences. Figure 1 is an example of the present paradigm – a system based on an appropriate "level of protection", which provides credence to the notion that "the government is responsible" and "therefore, we are protected." Complicating the matter, many prudent cost share sponsors seek to limit their costs; which drives some to seek to achieve only a level of protection whereby community members will not be required to purchase flood insurance.

2/26/2008

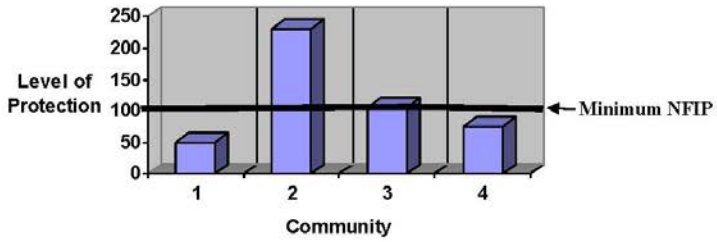

Figure 1 – Selecting Level of Protection

Where we need to be – "We are all responsible for our safety"

To significantly improve public safety, we are pursuing a level of public education at which our fellow citizens are so well informed they are able to assume responsibility for decisions they make about where and how they want to live and work. We then can engage in a comprehensive and multi-government and private citizen collaborative process to *managing flood risk* to achieve levels of tolerable risk. The Corps is expanding our traditional approach to focus on the most effective combination of tools available that citizens may use to lower or "buy down" their flood risk (as illustrated in Figure 2). We will consider not only reducing the probability of flooding, but also reducing the consequences should a flood occur. A multitude of options and tools becomes more evident through the process of assessing the consequences of a flood. Furthermore, the decision on which tools to implement involves all stakeholders. For example, the Corps can help reduce risk by levee construction. Whereas in a coordinated but independent action, local government can further reduce flood risk by implementing flood plain management actions such as evacuation plans, zoning ordinances, and public outreach.

This cannot be achieved without a new paradigm of joint partnerships in a comprehensive approach of public education and flood risk management. For instance, the insurance industry has a similar goal of assessing hazards and therefore, there exists an opportunity for the federal government and insurance industry to leverage mutual efforts, such as in the areas of research and development, implementation of assessment tools, and increase of public and policy-makers awareness.

2/26/2008

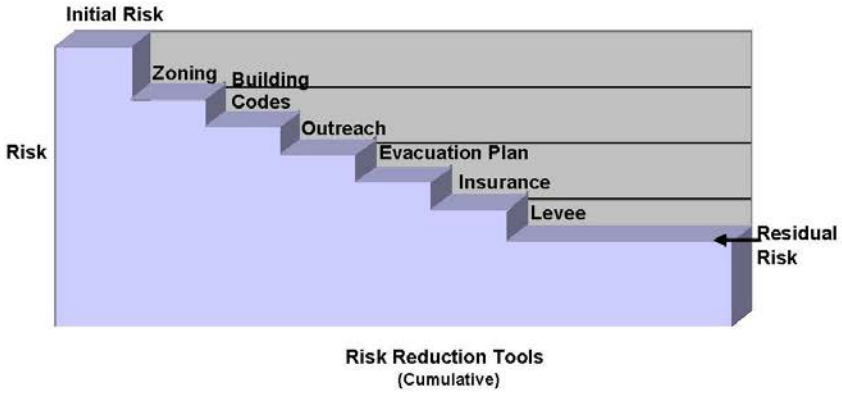

Figure 2 - FLOOD RISK MANAGEMENT: ALL STAKEHOLDERS CONTRIBUTE TO REDUCING RISK

What we are doing now

In May 2006, USACE established the National Flood Risk Management Program (NFRMP) to take the first step of bringing together other federal agencies, state and local governments and agencies, and the private sector to develop and implement a unified national flood risk management strategy that eliminates conflicts between different flood risk management programs and takes advantage of all opportunities for collaboration. Additionally, we are seeking partnerships with those that best understand risk, such as banking and insurance industries to share data and risk model development. We also wish to collaborate more closely with business councils and developers so they understand local flood risks, and can assist us in public education campaigns.

An integral part of the NFRMP is the Interagency Flood Risk Management Committee (IFRMC), with core leadership from USACE, FEMA, Association of State Flood Plain Managers (ASFPM), and the National Association of Flood and Stormwater Management Agencies (NAFSMA). This committee will be expanded to include other stakeholder groups, such as resource agencies. Through this process, organizational leadership should use or change, when practicable, existing policies and programs to transition into a comprehensive and shared process of lowering or "buying down" flood risks. As the transition occurs, the IFRMC should identify and recommend necessary administrative, policy, and legislative changes for complete implementation of the collaborative risk-informed decision process for managing flood risks.

Letter O4—American Rivers Trust, et al., John Cain, et al., March 15, 2013

Letter O4

American Rivers ♦ American Whitewater ♦ Audubon California
California Trout ♦ California Waterfowl Association
Defenders of Wildlife ♦ Friends of the River
Planning and Conservation League ♦ Sacramento River Preservation Trust
South Yuba River Citizens League ♦ Trout Unlimited

March 15, 2013

Michael Inamine, Executive Director
Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

RE: February 15, 2013 Comment Letter on Feather River West Levee Project

Dear Mr. Inamine:

On behalf of the organizations that submitted a comment letter on the Draft Environmental Impact Report/Statement (DEIR/DEIS) for the Feather River West Levee Project (FRWLP), we appreciate the time that you and the Sutter Butte Flood Control Agency (SBFCA) staff have taken to meet with representatives from the NGO community and provide more information about the project and responded to our comment letter and to the more detailed comments provided by American Rivers (the comment letter's Attachment A).

Based on the information provided in those meetings and our related discussions, the nature of our concerns (and the concerns expressed by American Rivers in its more detailed comment letter) about the project has changed, and this letter is intended to clarify those changes.

1. Growth

O4-A We have no additional comments on this topic. We look forward to further discussion and response to this comment.

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2. Risks to Downstream Communities

O4-B

Our February 15 letter expressed concern that the project may increase flood risk to local and downstream communities. First, this comment was based on the assumption that the project extends to the south as far as the Sutter Bypass. Through our conversations it is now clear that the FRWLP does not involve 200-year protection south of Yuba City. Finally, we understand that the FRWLP is not a levee improvement project; the project partially rehabilitates the levee in order to restore protection from flooding for residents of Butte and Sutter Counties. It does not improve the levee to a standard above that which was assumed to exist before the development of new criteria for levee seepage. Before SBFCA implements any future project which may propose improvements downstream of Laurel Avenue, we request a briefing from SBFCA on the hydraulic impacts (if any) of such an improvement to better understand the issue.

3. Adequacy of Hydraulic Information

O4-C

Our February 15 comment letter stated that the DEIR/DEIS lacked sufficient hydraulic information to support the document's alternatives analysis. SBFCA staff has provided a copy of the Sutter Basin Area Plan as well as clarification on flood inundation maps. The FRWLP's purpose is now more clear (i.e., to partially rehabilitate the Feather River levee to protect residents from flooding). The alternatives were developed based on varying measures that could resolve deficiencies in the Feather River levee, rather than on the hydraulic analysis underlying the Engineer's Report that supports SBFCA's assessment district. There is no need for reissuance of the DEIR/DEIS based on this issue.

4. Executive Order 11988

O4-D

We have no additional comments on this topic. We look forward to further discussion and response to this comment.

5. Range of Alternatives

O4-E

Our February 15 comment letter expressed concerns about whether the DEIR considered a reasonable range of alternatives for protection of public safety. Our letter proposed that SBFCA consider alternatives such as house elevation, ring levees, etc. Based on our meetings, and a further review of screened-out alternatives not discussed in the EIR/EIS, it is now clear that the purpose of the project is reducing flood risk for the SBFCA area by addressing known deficiencies along the Feather River along its existing alignment and does not preclude additional measures to reduce flood risk or advance the objectives of the CVFPP. With this understanding, and after further review of the DEIR/DEIS, we now conclude that the range of alternatives analyzed in the document is adequate.

6. Multi-Benefit Approach

O4-F

We have no additional comments on this topic. We look forward to further discussion and response to this comment.

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7. Public Access

O4-G We have no additional comments on this topic. We look forward to further discussion and response to this comment.

8. Climate Change

O4-H We have no additional comments on this topic. We look forward to further discussion and response to this comment.

9. Project Performance with Other Foreseeable Projects

O4-I Our February 15 comment letter expressed concerns that the DEIR/DEIS did not evaluate the performance of alternatives in combination with existing and foreseeable expanded bypass projects. This comment was based on the assumption that the FRWLP extended south to the Sutter Bypass and that the proposed measures were highly sensitive to water surface elevation. Because the FRWLP will not preclude potential expanded bypasses along the lower Feather River and the Sutter Bypass, and with the knowledge that the geotechnical deficiencies are not highly sensitive to water surface elevation, this comment is no longer applicable.

10. Cumulative Effects on Fish and Wildlife Resources

O4-J From our meetings, we now understand SBFCA's commitment to multi-benefit projects, including ecosystem restoration for fish and wildlife habitat, and the habitat that will be created as a direct result of the FRWLP at the Star Bend site. We further understand the importance of the FRWLP in providing the foundation for other restoration along the Feather River corridor. The SBFCA has agreed to enter into an MOU and work with the NGO community to advance a number of multi-benefit flood management projects, which when completed, will partially mitigate for the cumulative effects on fish and wildlife resources from construction and operation of facilities of the State Plan of Flood Control. Our organizations look forward to collaborating with SBFCA, its regional partners, state agencies, and the fish and wildlife agencies on these activities. We specifically offer technical assistance through our floodplain enhancement tool and implementation assistance in finding funding partners and programs.

Conclusion

Our organizations appreciate both the additional information and clarifications SBFCA staff have offered as well as the commitments SBFCA has made as described in the MOU with American Rivers and SBFCA. We are therefore pleased to support SBFCA's Feather River West Levee Project as well as SBFCA's related efforts to enhance fish and wildlife habitat in the Feather River corridor. Our concerns as expressed in our February 15 letter have been addressed by SBFCA staff and the commitments provided by SBFCA in the MOU with American Rivers. As a result we agree that the DEIR/DEIS fulfills SBFCA's obligation under CEQA and NEPA to disclose and mitigate the project's anticipated impacts on the environment. Although some of our organizations never intended to legally challenge the DEIR/DEIS, we understand your need to clarify our intentions and therefore we hereby agree not to bring legal challenge based on CEQA or NEPA to the FRWLP as described in the December 2012 DEIR/DEIS subject to the

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provisions of the MOU. We applaud SBFCA's leadership role in garnering the resources necessary to advance flood management in the Sutter Basin and reiterate our desire to work constructively with SBFCA to expedite sustainable flood protection for the project area.

Sincerely,

John Cain
American Rivers

Curtis Knight
California Trout

Diana Jacobs
Sacramento River Preservation Trust

Chandra Ferrari
Trout Unlimited

Dave Steindorf
American Whitewater

Mark Hennelly
California Waterfowl Association

Kim Delfino
Defenders of Wildlife

Ron Stork
Friends of the River

Jonas Minton
Planning and Conservation League

Caleb Dardick
South Yuba River Citizens League

Meghan Hertel
Audubon California

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Version of March 15, 2013
Subject to CA Evidence Code Sec. 1152 and 1154

Memorandum of Understanding Regarding Feather River Regional Flood Planning and the Environmental Impact Statement/Environmental Impact Report for the Feather River West Levee Project

This Memorandum of Understanding (MOU) is by and among the Sutter Butte Flood Control Agency (SBFCA), American Rivers, and other parties who may later execute this MOU. American Rivers and any other non-governmental organizations who later sign this MOU shall be collectively referred to as the NGOs.

1. **Recitals.** This MOU is executed in light of the following facts:

   1.1. The Feather River West Levee Project (FRWLP) is a public safety project that directly impacts the lives and livelihoods of approximately 88,000 people in an economically disadvantaged community that has suffered numerous failures of the Feather River west levee, including the deadly and devastating 1955 flood.

   1.2. On February 15, 2013, thirteen non-governmental organizations (the Commentors) sent a comment letter to SBFCA and the U.S. Army Corps of Engineers on the public draft of the FRWLP environmental impact report/environmental impact statement (EIS/EIR).

   1.3. The comment letter raised questions about the adequacy of the EIS/EIR and also raised concerns that SBFCA's project does not advance environmental restoration or sufficiently reduce flood risk due to the largely "fix-in-place" philosophy of the FRWLP.

   1.4. SBFCA deliberately structured the FRWLP to, where possible, be contained within the current levee footprint to simplify regulatory approvals, result in the least amount of land acquisition, minimize environmental impacts, and provide the greatest flood damage reduction benefit at the least cost.

   1.5. The NGOs desire to work with SBFCA to advance a multi-benefit flood management program that advances the objectives of the CVFPP and serves as a model for flood management across the state and nation.

   1.6. SBFCA is interested in multi-benefit flood management projects where those projects are cost effective, fundable, and provide flood protection benefits to the Sutter Basin.

   1.7. SBFCA acknowledges that additional elements of a multi-objective approach for the Feather River watershed beyond the FRWLP, such as are described herein, would further reduce flood risk to the Sutter Basin, mitigate for past degradation of the Feather River ecosystem from facilities of the State Plan of Flood Control, and advance the objectives of the Central Valley Flood Protection Plan (CVFPP).

1.8. The Feather River Regional Flood Management Plan (RFMP) is a partnership with Yuba County Water Agency, Three Rivers Levee Improvement Agency, Marysville Levee Commission, SBFCA, and other stakeholders with the charge of developing a broadly supported flood management plan for the Feather River region that aligns with the CVFPP and qualifies projects for future state and federal funding.

1.9. There is a value to SBFCA to having a commitment from the Commentors that they will not challenge the FRWLP DEIR/DEIS and will support the FRWLP. There is a value to the Commentors from SBFCA making certain commitments regarding future ecosystem restoration projects. There is a value to all partners in active participation in the Feather River RFMP.

1.10. A purpose of this MOU is to form a partnership between SBFCA and the NGOs to advance multi-benefit flood management projects that will benefit the communities along the Feather River

2. **Commitments of Sutter Butte Flood Control Agency.** By this MOU, SBFCA commits to make good faith efforts as follows.

2.1. **Commenting on Funding Guidelines.** SBFCA agrees to provide comments to any draft funding guidelines issued by the California Department of Water Resources for multi-objective projects which could be implemented by SBFCA in the Sutter Basin. Along with its other comments, SBFCA shall advocate for DWR to provide funding for multi-benefit projects that advance the objectives of the CVFPP including ecosystem restoration, improved public access, acquisition of easements from voluntary sellers to limit urban development of floodplains, and allow for the future expansion of floodways where necessary to protect public safety and where there is local support for the project. SBFCA's comments shall advocate that these elements be funded by DWR without an increased local-cost share.

2.2. **Applications for Funding.** SBFCA agrees to seek funding for the list of projects listed in sections 2.2 and 2.4 (if applicable), only to the extent that SBFCA would not incur any net increase in costs associated with implementing such projects beyond the costs of the FRWLP. In doing so, SBFCA shall first coordinate, to the extent possible, with one or more representative NGOs to make the NGOs aware of SBFCA's efforts. In particular, SBFCA agrees to work with the NGOs to send a joint letter to the Department of Water Resources within 30 days of the effective date of this MOU renewing a request for funding for the projects identified in Sections 2.2.2. and 2.2.4. SBFCA shall seek additional funding for design, permitting, and implementation of elements identified in other subsections of sections 2.2 and 2.4 (if applicable) when it requests additional funds from DWR for subsequent phases of the FRWLP. Implementation of the following projects would help mitigate for years of alterations to the Feather River ecosystem from the State Plan of Flood Control facilities:

2.2.1. In partnership with Three Rivers Levee Improvement Authority (TRLIA), enhancing and expanding restoration as part of a levee setback area on the east side of the Feather River to serve as habitat mitigation as a near-term component of the FRWLP and other projects, and as described in the preliminarily approved DWR FESSRO grant application signed by SBFCA;

2.2.2. Developing and implementing a multi-benefit project in the Oroville Wildlife Area to decrease water surface elevations in the Feather River, restore and improve floodplain habitat, improve flood operations, and reduce maintenance costs;

2.2.3. Creation of approximately 20 acres of riparian habitat by SBFCA in addition to the approximately 20 acres already created by Levee District #1;

2.2.4. A multi-benefit project at Abbott Lake that would provide levee borrow material to support levee reconstruction while modifying the floodplain surface to be beneficial to fish and wildlife;

2.2.5. The potential for a setback levee south of Laurel Avenue if there is a willing seller and local support and the project would help achieve 100-year food protection for the southern portion of the basin, all in order to create a mosaic of riparian floodplain habitat and agriculturally productive land that provides flood management benefits for the Sutter Basin, along with acquisition of any necessary easements or land necessary to implement a setback;

2.2.6. An environmental restoration project located at Nelson Slough as identified by the Lower Feather River Corridor Management Plan;

2.2.7. A State-funded program to purchase agricultural easements from willing-sellers to promote agriculture and to meet ecosystem restoration goals identified in the CVFPP and as a public safety strategy to manage long-term risk in the floodplain.

2.2.8. Such other projects which the NGOs identify to SBFCA as providing environmental restoration and flood management opportunities within SBFCA's area of jurisdiction and for which SBFCA concurs.

2.3. **Effect of FEMA Regulations on Agriculture.** SBFCA agrees to pursue appropriate changes in the National Flood Insurance Program that will promote agriculture continuing to thrive in protected floodplains recognizing that agriculture is often the best way to manage risk in the levee–protected floodplains of California's Central Valley.

2.4. **Public Access.** SBFCA does not operate and maintain levees and therefore does not promote or limit public access; nor does the FRWLP propose to alter existing

access. SBFCA shall, through its participation in the Feather River RFMP, consider and work on public access issues.

2.5. **Coordination.** SBFCA agrees to meet with the NGOs on a regular basis to discuss implementation of the commitments made in this MOU.

3. **Commitments of the NGOs.** By this MOU, the NGOs commit to make good faith efforts as follows:

3.1. **Support for FRWLP.** The NGOs agree to promptly execute and send the letter attached to this MOU as Attachment 1 and to promptly facilitate execution of the letter by the Commentors. Subject to the limitations in Section 4.2, the NGOs further agree that: (i) the FRWLP is an indispensable, no-regrets part of any program to reduce flood risk in the SBFCA planning area, and (ii) they will support the FRWLP in the future, if asked by SBFCA, in any legislative, administrative, or judicial forum, including the Central Valley Flood Protection Board.

3.2. **Agreement to Not Sue.** The NGOs agree to not bring any action in state or federal court under any applicable State or Federal laws challenging the adoption of the EIS/EIR and, subject to the limitation in Section 4.2, implementation of the FRWLP.

3.3. **Support and Efforts to Locate Funding.** The NGOs agree to cooperate with SBFCA in seeking funding from the California Department of Water Resources (DWR) for the FRWLP and the projects identified under Section 2.2, provided that DWR or other government agencies elect to fund some of the projects contained in Section 2.2.. The NGOs further agree to investigate and pursue funding for the projects identified under Section 2.2 from sources other than the California Department of Water Resources.

3.4. **Coordination.** The NGOs agree to appoint representative(s) to meet with SBFCA on a regular basis to discuss implementation of the commitments made in this MOU.

4. **Miscellaneous Provisions.**

4.1. **Amendment.** This MOU may be amended only by further written instrument executed by all Parties. Other non-governmental organizations may execute this MOU upon approval by American Rivers and SBFCA, which approval shall not be unreasonably withheld.

4.2. **Dispute Resolution.** The Parties agree to use good faith efforts to resolve any disputes that may arise in the implementation of this MOU. If any party to this MOU believes that another party is not satisfying its obligations under the MOU, then the complaining party may provide written notice of the concern along with a request that the other party cure the concern within a reasonable and stated period of time. If, upon expiration of the period set for cure, the complaining party does

not believe that the concern has been cured, then the complaining party may provide written notice that it is withdrawing from the MOU, and the complaining party shall thereafter have no further obligations to comply with the provisions of this MOU.

4.3. **Counterparts.** This MOU may be executed in counterparts.

4.4. **Term.** Unless terminated earlier or extended longer pursuant to Section 4.1, this MOU shall terminate upon the adoption of the 2022 update of the CVFPP.

4.5. **Effective Date.** This MOU shall be effective upon the following two actions: (i) execution of this MOU by American Rivers and SBFCA, and (ii) execution of the letter contained in Attachment 1 by all Commentors before 8:00 am on Friday, March 15, 2013. In the event that not all Commentors execute the letter contained in Attachment 1 before 8:00 am on Friday, March 15, SBFCA shall have the right to withdraw from the MOU upon written notice to the NGOs.

This MOU is executed by the Parties as follows:

Dated: 3/15/13

Michael Inamine
SBFCA

Approved as to form:

Scott Shapiro, SBFCA General Counsel

Dated: _____

John Cain
American Rivers

Dated: 3/15/13

Kristin May
American Rivers

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This MOU is executed by the Parties as follows:

Dated: _____

_____
Michael Inamine
SBFCA

Approved as to form:

_____
Scott Shapiro, SBFCA General Counsel

Dated: 3/15/13

_____
John Cain
American Rivers

Dated: 3/15/13

_____
Kristin May
American Rivers

Response to Letter O2, O3, and O4

A group of non-governmental organizations (NGOs) with environmental interests commented on the Draft EIS/EIR in a letter submitted on February 13, 2013. This letter was slightly revised and re-submitted on February 15, 2013. The signatories of the letter are American Rivers, American Whitewater, Audubon California, California Trout, California Waterfowl Association, Defenders of Wildlife, Friends of the River, Natural Resources Defense Council (NRDC), Planning and Conservation League, Sacramento River Preservation Trust, South Yuba River Citizens League, The Bay Institute, and Trout Unlimited. SBFCA staff and consultants have been in communication with members of these organizations during project planning, leading to a meeting held in Yuba City on November 9, 2012. Following receipt of the comment letter on the Draft EIS/EIR, SBFCA began a series of in-depth, productive, and constructive meetings with the NGOs, represented by American Rivers, which took place on February 19, February 27, and March 7, 2013. These conversations led to execution of a Memorandum of Understanding (MOU) between SBFCA and the 13 NGOs on March 15, 2013, approved by resolution from SBFCA's Board of Directors on March 13, 2013. The MOU is an attachment to the March 15 letter, immediately preceding this response.

The MOU is a landmark agreement in which SBFCA agrees to pursue multi-benefit actions, pursue flood mapping reforms to promote agriculture and protect floodplains, consider public access, and coordinate with the NGOs in these endeavors. In exchange, the NGOs offer support for the FRWLP, agreement to not bring legal action against the FRWLP or its approvals, seek funding, and coordinate with SBFCA. The MOU accompanies a letter from 11 of the NGOs supplementing the comment letters transmitted in February with clarifying discourse on 5 of the 10 comment areas from the original letters. The remaining two NGOs (NRDC and The Bay Institute) submitted an abbreviated letter that effectively states that the concerns of the prior letters have been addressed and the signatory NGOs agree to not bring a legal challenge based on NEPA or CEQA.

As introduced above, the NGO letters follow an identical structure of 10 comment areas. The responses follow this same structure.

O2-, O3-, and O4-A

This comment from the February 13 and February 15 letters primarily concerns growth inducement that may result from the project. As a first point, SBFCA supports the concept of responsible planning and providing for sustainable systems in terms of healthy, multi-benefit river corridors and economically viable communities. It is understood that these goals are supported by the NGOs as well. While some growth may occur, with or without the project, the focus of the FRWLP is to reduce flood risk for the lives and livelihoods of an existing population of 88,000 people in an economically disadvantaged community that has suffered numerous failures of the Feather River west levee. This is the opening recital of the MOU that has now been agreed to by SBFCA and the NGOs.

Much of the substance of this comment focuses on growth projections. It must be understood that projections are highly speculative and influenced by a number of factors. One such example is referenced in the comment, regarding Live Oak. According to officials with the City of Live Oak, the population growth estimates in the General Plan were intended in specific application for the purposes of conservative planning and potential "most-case" scenario effect evaluation, not with the goal or expectation of meeting them. Per page 2-6 of the Live Oak General Plan EIR, build-out estimates in the General Plan are not population or employment projections, nor are they forecasts of future development; they are a conservative estimate of the total development capacity within the

Planning Area if all parcels were to be fully developed. Actual and projected growth has been highly consistent with Sacramento Area Council of Governments' (SACOG's) future population growth estimates based on the historical growth averages cited on page 3-1 of the same EIR. Furthermore, current population data shows that Live Oak has actually decreased in population since 2008.

The comment raises specific questions, listed below.

- How does providing flood protection to a 326-square-mile area only remove 6,300 acres from the floodplain?

  Response: The 6,300 acres was calculated with geographic information systems (GIS) analysis as the projected reduction in total Special Flood Hazard Area (SFHA) in the study area between pre-FRWLP conditions vs. post-FRWLP conditions. The actual calculation was 6,227 acres, which was conservatively rounded upward to 6,300 for the EIS/EIR.

- How does the project only result in 1,500 acres of additional development when the General Plans for Yuba City, Live Oak, and Sutter County (not to mention Butte County) indicate proposals for significantly more growth?

  Response: The 1,500 was the estimated subset of the 6,300 where it overlaps with a sphere of influence (SOI), defined as potentially developable under a municipal general plan. The question prompted SBFCA's team to verify the methods and assumptions used for the calculation and in doing so, it was determined that in fact there is no overlap between the 6,227 and general plan SOIs in the study area. In other words, the 1,500 should be zero.

- Where are the 1,500 and 6,300 acres located?

  Response: Information was shared with the commenter in communications during the week of February 11, 2013, indicating that the 6,300 acres is concentrated on naturally occurring higher ground located east of Biggs and Gridley. This was a preliminary, cursory analysis based on topography. The 1,500 acres, as discussed above, was an error and should be zero.

- How would floodplain management laws limit growth under the no-action alternative compared to the proposed project?

  Response: It is considered too speculative to make a conclusive determination because many factors influence flood insurance rate mapping and floodplain management laws, such as Federal Emergency Management Agency (FEMA) restrictions.

- Do Sutter and Butte County need to build additional houses to generate sufficient tax revenues to fund the local cost-share for the project?

  Response: No, the project is not reliant on growth for funding.

In conclusion, the commenters' interests and concerns are appreciated and SBFCA will continue to work to address these issues toward comprehensive flood-risk reduction for the region. However, the focus of the FRWLP is to protect existing populations in communities that have suffered flood historically from known levee deficiencies, and the FRWLP is considered the most cost-effective and immediately feasible plan to reduce risk. Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-B

This comment from the February 13 and February 15 letters, clarified by the March 15 letter, primarily concerns risks to downstream communities. It also briefly discusses increased risk to local communities, but in terms focused largely on future growth that is addressed in the previous response. The concerns expressed in the February 13 and February 15 letters regarding increased risk to downstream communities were effectively withdrawn in the March 15 letter. As discussed in the comment and as agreed to in the MOU, SBFCA will coordinate with the NGOs in pursuing any future projects downstream of the FRWLP. It should further be noted that the target of 200-year protection is only for the area from Yuba City to the north to protect existing populations, 100-year as the target for the southern part of the planning area. To clarify the issue regarding differing flood protection targets for the planning area, the following text was added to the project purpose in Section 1.4.1, page 1-17: "The target of 100-year protection for the more rural, agriculture parts of the planning area, specifically the southern portion of the basin downstream of Yuba City, is driven by the goal to maintain viability and sustainability of agriculture by avoiding FEMA restrictions that would hinder construction or upgrade of agricultural infrastructure (such as farm residences, barns, silos, dryers, seasonal worker housing) and supporting businesses."

O2-, O3-, and O4-C

This comment from the February 13 and February 15 letters, clarified by the March 15 letter, primarily concerns adequacy of hydraulic information. The hydraulic information referenced in the EIS/EIR was subsequently provided and described to American Rivers in conversations with SBFCA. The comment was effectively withdrawn in the March 15 letter, which adds that there is no need for reissuance of the Draft EIS/EIR as asserted in the February letters. Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-D

This comment from the February 13 and February 15 letters primarily concerns compliance with EO 11988. It is agreed that there are other alternatives that reduce flood risk, and SBFCA and the State of California are actively and aggressively pursuing such measures. For example, through the Feather River Regional Flood Management Plan recently initiated, SBFCA, Three Rivers Levee Improvement Authority, Yuba County, Yuba County Water Agency, and the Marysville Levee Commission are developing a collaborative regional plan to comprehensively address issues on both sides of the Feather River, including the perspectives of the agricultural and environmental communities toward multi-benefit projects. However, these actions would not address the documented deficiencies in the west levee of the Feather River and would not address Federal and state flood management criteria. These deficiencies have contributed to multiple catastrophic failures in the past 100 years. Addressing these deficiencies through the FRWLP is the only alternative to meet that purpose and to cost-effectively reduce flood risk for existing populations. This conclusion is supported by preliminary results from the Sutter Basin Feasibility Study. Nonetheless, SBFCA is committed to studying the types of measures and alternatives suggested by the NGOs through the Feather River Regional Flood Management Plan and as agreed to in the MOU.

It should be further noted that the change in pre-project and post-project growth is negligible because as stated in Section 4.1.3.1 on page 4-8 that: "The FRWLP, if implemented, would potentially remove approximately 6,300 acres from the current officially mapped FEMA floodplain; however, none of this acreage is within areas planned for growth under the adopted municipal general plans,

based on analysis of when the area potentially removed from the floodplain is overlain with the sphere-of-influence of each city." The project goal is to address known deficiencies to restore the intended function of the levees in line with the previously approved and authorized condition. Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-E

This comment from the February 13 and February 15 letters, clarified by the March 15 letter, primarily concerns adequacy of the range of alternatives considered for the FRWLP. The comment was effectively withdrawn in the March 15 letter and the range of alternatives is concluded to be adequate. Through conversations between the SBFCA team and NGOs, the contributing factors in the agreement of the adequacy of the range of alternatives primarily stem from a better understanding on the part of the NGOs of:

- the project purpose and need to address documented levee deficiencies to achieve 200-year protection in the populated portion of the planning area and 100-year in the more rural areas,
- the flood risk and real catastrophes resulting from through-seepage and under-seepage,
- the engineering studies that have been conducted to develop the alternatives, and
- potential for future multi-benefit projects including habitat restoration.

Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-F

This comment from the February 13 and February 15 letters primarily concerns the FRWLP's lack of a multi-benefit approach. SBFCA is resolutely committed to seeking multi-benefit solutions. One such example is a floodplain restoration and hydraulic improvement project in the Oroville Wildlife Area at the north end of the FRWLP. SBFCA has pursued and is actively pursuing funding for this action in partnership with state agencies, NGOs, and the private sector. Another example is SBFCA's proposal to mitigate woody vegetation effects from the FRWLP through revegetation of the floodplain restoration area created by the Star Bend levee setback. This proposal has received strong conceptual support from the fish and wildlife agencies and is a direct component of the FRWLP. Mitigation at Star Bend represents biodiversity and ecological structure and patch size that far outweigh the individual trees for which they are compensating. These actions and others are only made possible by addressing the levee deficiencies first, providing the foundation upon which multi-benefit building blocks can be laid (i.e., to use another metaphor, the levee remains the "backbone" of the system). SBFCA's commitment to pursuing these and similar habitat restoration and multi-benefit actions is documented in the MOU. In regard to the specific element of the comment about accommodation of future floodplain restoration in terms of hydraulic performance, the Feather River corridor in the study area has sufficient conveyance capacity and the FRWLP has been designed with a sufficient factor of safety to specifically facilitate future floodplain restoration while still meeting or exceeding flood management objectives. The FRWLP is a true "no regrets" project in the spirit of the state funding guidelines. Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-G

This comment from the February 13 and February 15 letters primarily concerns public access to the river corridor and the FRWLP's effect on access. SBFCA is very sensitive to the issue of the public's right to access. Conversely, SBFCA has constituents with strong concerns about public access. Generally, it is agreed that the public has the right to use of the river and that the Feather River is navigable by small, recreational craft. It is further acknowledged that there are limitations to access, including locked gates, lack of signage, lack of developed put-in/take-out points for non-motorized craft, and lack of parking and other amenities. It is acknowledged that there are public lands in the river corridor, including those controlled by the State of California, that are not accessible for public use. However, SBFCA does not have responsibility to address these issues as part of its proposed project focused on flood risk-reduction measures to address documented levee deficiencies according to Federal and state criteria.

The fundamental analytical premise under NEPA and CEQA is to assess the change that would occur as a result of the project. SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. From the larger perspective of SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution to adopt the MOU, which specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study.

Specific to the element of the comment regarding the environmental commitment for boat launch and park facilities, it can be found in Section 2.3.4, *Property Access Limitations, Disturbances, and Service Disruptions*, Section 2.3.4.1, *Public Use Areas*.

O2-, O3-, and O4-H

This comment from the February 13 and February 15 letters primarily concerns climate change and future hydrologic conditions. It is agreed that climate change and future precipitation and run-off patterns are important to recognize and that today's plans need to envision alternative future scenarios. In project planning and design, the calculations assumed an "over-build" factor of safety to accommodate hydrologic conditions greater than the current design flow. Further, there is surplus freeboard in the system because the levee heights were set prior to construction of Lake Oroville and New Bullards Bar Reservoir, which attenuate flows. Beyond the FRWLP, SBFCA is studying measures that address conveyance and storage as suggested in the comment. The Feather River Regional Flood Management Plan, just initiated and co-led by SBFCA as the next phase of the Central Valley Flood Protection Plan, is one such venue to look at system-wide issues affecting the region and comprehensive measures to address them. Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-I

This comment from the February 13 and February 15 letters, clarified by the March 15 letter, primarily concerns project performance with other foreseeable actions. It is now mutually

understood that the FRWLP terminates at a point to allow for potential future levee setback or expanded bypass options downstream of the project. This comment is effectively withdrawn in the March 15 letter, concluding with the statement that it is no longer applicable. Comment did not necessitate change to the Final EIS.

O2-, O3-, and O4-J

This comment from the February 13 and February 15 letters, clarified by the March 15 letter, primarily concerns cumulative effects on fish and wildlife resources. Two specific elements of the comment should be addressed. One is regarding the loss of habitat. It is agreed and acknowledged that historical degradation of habitat has been severe and fish and wildlife have declined in population and biodiversity. However, these conditions are part of the existing environment at the time of the noticing and analysis for the project and therefore are not factored cumulatively. In fact, the project has undergone several iterations of extensive avoidance and minimization to result in a project with minimal effects and streamlined approval processes through the permitting agencies. The project represents a "no regrets" action for flood-risk reduction that allows for substantial restoration of fish and wildlife habitat in the floodplain. The second element of the comment that should be addressed regards conveyance capacity and accommodation of floodplain restoration. As described in previous comments, the levees were built prior to upstream reservoirs, resulting in a surplus of freeboard because the reservoirs attenuate peak flows and control the flow in the river. The levees were also constructed setback from the active channel of the river for the majority of the study area. Therefore, the Feather River is not considered to be constrained by capacity in the study area. Further, the project has been designed with an additional factor of safety to accommodate future scenarios of high water-surface elevations that may result from increased channel roughness (i.e., more vegetation) or increased runoff from changed future hydrology. Moreover, this comment is effectively withdrawn in the March 15 letter based on the MOU and SBFCA's commitment to pursue multi-benefit projects to enhance fish and wildlife habitat. It is agreed that floodplain restoration is highly desirable and the FRWLP would accommodate future restoration actions to be pursued by SBFCA.

It should be noted that the project does include ecosystem restoration through habitat mitigation provided at the Star Bend setback levee site. An MMP has been included as an appendix to this document (Appendix F.3). The MMP features enhancement of floodplain habitat for benefit of fish and wildlife, in collaboration and contiguous with restoration efforts by CDFW.

Letter O5—Natural Resources Defense Council and The Bay Institute, Monty Schmitt and Gary Bobker, March 14, 2013

Letter O5

March 14, 2013

Michael Inamine, Executive Director
Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

RE: February 15, 2013 Comment Letter on Feather River West Levee Project

Dear Mr. Inamine:

O5-A On behalf of the Natural Resources Defense Council (NRDC), I appreciate the time that you and the Sutter Butte Flood Control Agency (SBFCA) staff have taken to meet with representatives from American Rivers and provide information to them about the Feather River West Levee Project, for which NRDC jointly filed comments on the public draft environmental impact statement/environmental impact report (EIS/EIR). Based on the information provided in those meetings, this letter is intended to clarify NRDC's position on the project.

We are pleased to support the project as well as SBFCA's related efforts to enhance fish and wildlife habitat in the Feather River corridor. Our concerns as expressed in the February 15 letter have been addressed by SBFCA staff and the commitments provided by SBFCA in the Memorandum of Understanding which it is executing with American Rivers. As a result, we agree that we will not bring a legal challenge based on CEQA or NEPA to the FRWLP as described in the December 2012 DEIR/DEIS.

Sincerely,

Monty Schmitt
Senior Scientist
Natural Resources Defense Council

Gary Bobker
The Bay Institute

Response to Letter O5

O5-A

SBFCA appreciates NRDC's and The Bay Institute's interest in the FRWLP and that the signatories agree to not bring a legal challenge based on NEPA or CEQA. Moreover, SBFCA looks forward to working with NRDC and The Bay Institute as part of the Feather River Regional Flood Management Plan to work on mutually agreed and multi-benefit approaches for the ecological and economic health of the region from comprehensive flood management planning.

Letter O6—Patrick Porgans, February 26, 2013

PATRICK PORGANS & ASSOCIATES

Letter O6

Elemental-Bio-Terrestrial Solutionist™

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Serving the Public and Private Sectors Since 1973

26 February 2013

To: **Jeff Koschak**
Senior Environmental Manager
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814-2992
Email: jeff.a.koschak@usace.army.mil Fax: (916) 557-7856

Re: Comments on Feather River West Levee Project Draft EIS/EIR

Dear Sir:

In accordance with our telephone conversation of 25 February 2013, and your subsequent email, Porgans & Associates (P&A) are submitting the following comments on the Draft Feather River West Levee Project Environmental Impact Statement (DEIS) and the Environmental Impact Report (DEIR). However, before doing so, on behalf of my clients, P&A would like to extend our appreciation for providing the opportunity to submit comments, which, as you mentioned, would be included and addressed in the final EIS/EIR.

O6-A

Note I: In order for the reader to better understand and comprehend how and why the aforementioned project and/or actions present a significant unmitigated threat to the safety, wellbeing, and sustainability of downstream properties, it is important to understands that only a small fraction of the historical floodwater flows made their way down the mainstem of the Feather River; the majority of the floodwaters overtopped the west bank of the river into the Butte and Sutter Basins.

As a result of the lack of notification it is impossible to adequately response to the 1483 pages of information contained in the DEIS/DEIR; therefore, P&A will briefly address and comment on the most incongruent issues as it pertains to the approach undertaken: (1) Adequacy of the DEIS/DEIR; (2) Effectiveness of the plan, and (3) conflicting information pertaining to historical flooding.

O6-B

(1) **Adequacy of the DEIS/DEIR**: Although the DEIS/DEIR is voluminous and contains a substantial amount of information, as it pertains to the assessment of the alternatives; the applicant-preferred alternative (APA), while possibly serving the intent of the Sutter Butte Flood Control Agency's (SBFCA) objectives to reduce seepage and future levee failure. However, the APA, as proposed would exacerbate and compound historical flood related threats and unmitigated damages attributable to past government-sanctioned flood control protections to property owners and public trust resources on the east bank of the Feather River, commencing from the bridge at Highway 160 down to the Honcut Creek, as there are no project levees located within this reach on the east bank. The following information confirms the fact that government was aware of the fact flooding would occur on the east side however it opted not to provide flood control protection for this reach of the Feather River, thus leaving properties vulnerable to increased flood damage.

RESPONSE: Historical and Existing Flood Protections Detrimental to Downstream Property Owners

P&A obtained a copy of a Department of Water Resources' (DWR) confidential report that attest to the fact that since the construction of government sanctioned project levees, on the west bank of the river, commencing at Hamilton Bend to the river's confluence at Honcut Creek, significantly exacerbated subsequent flood damages downstream. The Project levees were willfully designed and constructed to restrict the natural-historical overflow configuration of the channel, and sanctioned higher levels of floodwater to be constricted within the channel. Reconfiguration of the channel's carrying capacity can increased the duration, stages, and velocity of floodwaters, which now subject the eastern portion of the river channel to heightened flooding and inundation to properties such as JEM Farms. The documentation to support this contention was outlined in detailed in Department of Water Resources (DWR's 1957 confidential report; excerpts from that document, read as follow:

> ***Under natural conditions the river channel were of moderate section and conveyed but a small fraction of the flood discharges. The lateral basins carried the greater portions of the flood waters and acted as flood storage reservoirs.*** *They also received and retained a large portion of the sediments delivered to the valley floor. During flood periods, the Feather River overflowed large areas beyond its defined low water channels from Hamilton Bend six miles below Oroville to its confluence with Sacramento River.* [Emphasis added]

O6-B cont'd

> *The volume of overflow waters along the west bank of the Feather River greatly exceeded the volumes discharged over the east bank. At Hamilton Bend overbank flows through Hamilton Slough and for a distance of several miles downstream there from coursed westward to Butte Basin where they merged with the Sacramento River overflows near Colusa.* ***The magnitude of this cross-country flow from Feather River is evidenced from reports concerning the 1907 and 1909 floods which state that the rush of water from Feather River flowed across Butte Basin north of the Sutter-Buttes, breached the Sacramento River levees and entered Colusa Basin on the west side of that river.*** [1]
>
> *Along the east bank from Oroville to Honcut Creek the inundation was confined to a relatively narrow strip of land limited by bluffs paralleling the river channel. A wider area (now known as reclamation district 10) was subject to inundation between Honcut Creek and Yuba River.* [2] [Map 1, page 3.] [Emphasis added]

[1] Department of Water Resources' (DWR) 1957 Confidential Report to Board of Consultants, ***Feather River Flood Damage Studies***, 27 March 1957, p.2. [Note: Map I: Illustrates massive flood flows breaching Feather River Channel on the west bank near Hamilton Bend and Hazelbush Project Levee.

[2] FYI: Department of Water Resources' (DWR) 1957 Confidential Report, obtained by P&A, entitled, Feather River Damage Studies, Exhibit 1.

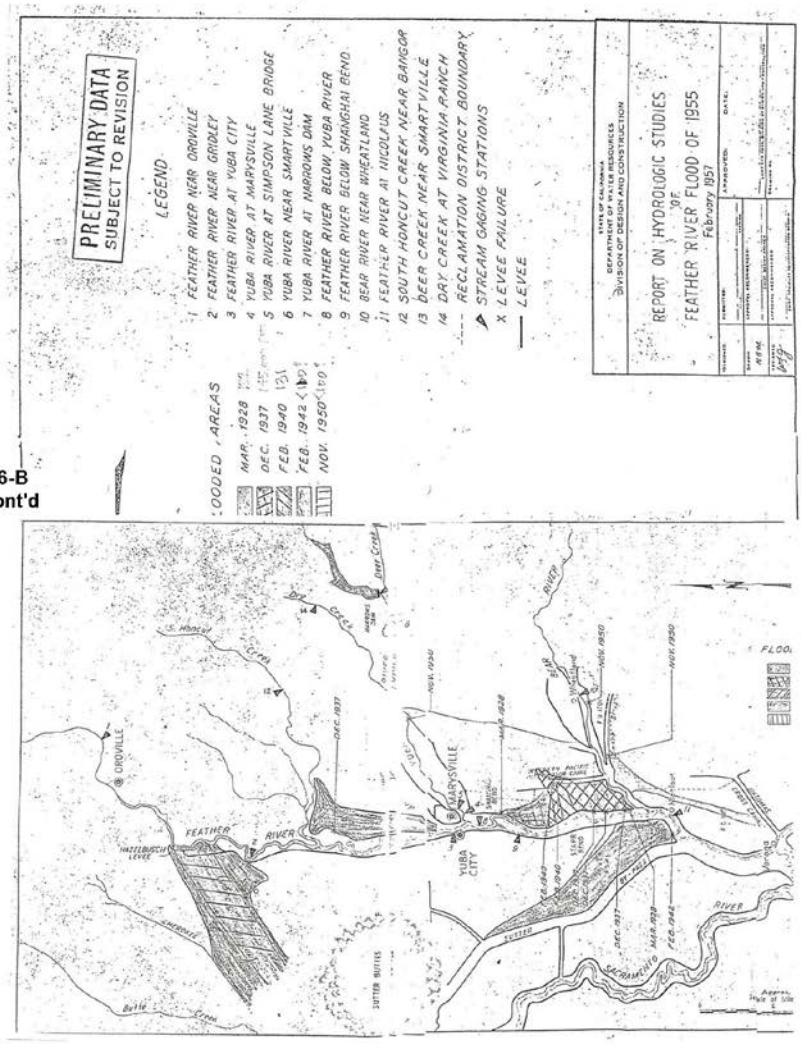
Re: Comments on Feather River West Levee Project Draft EIS/EIR Page 2 of 6

DRAFT

As stated, P&A's clients, with longstanding agricultural operations, located on the east side (left bank) of the Feather River, had not been notified of the proposed Feather River West Bank Levee Project (Project), although their properties and agricultural operations will be impacted by the proposed action.

Map 1: CONFIDENTIAL REPORT MAP

O6-B cont'd



Re: Comments on Feather River West Levee Project Draft EIS/EIR Page **3** of **6**

O6-B cont'd

Suffice it to say, there is a need to provide additional flood protection, such as the 41-miles of proposed levees, in this reach of the river, and although the clients are not opposed per se to the Project, they have expressed legitimate concerns as to the ongoing and future impacts of government sanctioned flood-control protections.

It is with the aforementioned thoughts in mind P&A respectfully submits the following comments and concerns regarding measures and alternatives not carried forward, as referenced in the DEIS/DEIR.

ES.2.4.2 Measures and Alternatives Not Carried Forward

Several measures and alternatives for the FRWLP were considered but not carried forward based on the screening criteria presented above. These alternatives are listed below and briefly described in Section 2.7.2.

- Alternative levee alignments.
- Setback levees.
- Ring levees.

O6-C

- J-levee.
- Reoperation of upstream reservoirs and bypasses.
- Development of additional upstream storage.
- Construction of Feather River Bypass.
- Raising Building Pads.
- River Dredging. [3]

Three of the above referenced alternatives, which have not been carried forward, and to wit P&A will limit is comments are reoperation of upstream reservoirs and bypasses; additional upstream storage; construction of Feather River Bypass, and river dredging.

Failure to carry forward reoperation of upstream reservoirs and bypasses; construction of Feather River Bypass and/or river dredging is sure to exacerbate flood damage and degradation of public trust resources on the east bank of the Feather River, in perpetuity, and under certain types of condition caused by natural or government induced phenomenon may put those urban areas beyond the west bank at even great risk in the event of levee failure.

(2) **Effectiveness of the Proposed Project:** The proposed project is myopic in scope, and limited in its ability to provide sufficient flood control protection because it omitted critical components of those other alternatives not carried forward, which, if integrated into the project would have afforded a greater degree of flood protection and safety for all concerned. Furthermore, due to the fact that the operation of the flood control facilities at the State Water Project's Oroville Dam and Reservoir play a major role in providing flood protections to minimize downstream damages is outside the jurisdiction of the SBFCA, is in an by itself a major flaw in the proposed project.

(3) **Design and Mismanagement of Flood Control Projects and Historical Operation of the SWP's Oroville Flood Control Facilities (floodwater releases) have and continue to exacerbate Flood Damages on the Left Bank of the Feather River:**

O6-D

Construction of the Sacramento River Flood Control Project levee on the west bank, south of Hamilton Bend commenced in the 1940s. The design capacity of the modified channel from Oroville Dam to Honcut Creek is 150,000

[3] U.S. Army Corps of Engineers and Sutter Butte Flood Control Agency Draft Feather River West Levee Project EIS/EIR, December 2012, p. ES-16.

cubic feet per second (cfs); 180,000 cfs above its confluence with the Yuba River, and 300,000 cfs below the confluence. According to the records, the design capacity of the channel was prefaced on the Flood of 1907.

U.S. Army Corps of Engineers' Flood Control Manual for Oroville Dam and Reservoir, Feather River, California, Report on Reservoir Regulations for Flood Control:

The Federal Flood Control Manual places limitations on flood water releases to the following: "Feather River flows should not exceed 150,000 cubic feet per second (cfs.) at Oroville nor 180,000 cfs. and 300,000 cfs. above and below the mouth of Yuba River, respectively."[4] During the 1986 and 1997 flood events, DWR made floodwater releases from Oroville Dam in excess of what is required in the manual. Furthermore, "Releases from Oroville Dam are not to be increased more than 10,000 cfs. nor decreased more than 5,000 cfs. in any two-hour period."[5] However, Department of Water Resources; (DWR) records (bi-hourly computation sheets) revealed that on several occasions it increased floodwater releases in 20,000 cfs. increments within a two-hour period during major flood events.

The flood control component of Oroville Dam was designed to handle a three-day-volume of 1.52 million acre-feet with a peak inflow of 440,000 cfs. (which did not occur during either the 1986 or 1997 flood), while restricting the maximum flood flow releases from the dam to 150,000 cfs. The maximum inflow during the 1997 flood was estimated at 300,000 cfs., and the three-day-volume was estimated at 1.25 million acre-feet; DWR claimed floodwater releases from Oroville Dam were about 163,000 cfs; however, Porgans & Associates' engineer, measured the floodwater releases, at the time, to be in excess of 173,000 cfs.

> "The primary objectives of flood control operation are (1) to minimized flood damage downstream, and (2) to avoid causing damage insofar as practicable, that would not have occurred under conditions without the project." The release schedule shown on Chart A-1 will provide protection for agricultural development with the floodway from frequently occurring floods, without sacrificing reservoir design flood (SPF) protection for lands outside the floodway." [6]

O6-D cont'd

Table 3-1-1. Common Flood Frequency Terminology

DWR has estimated that the channel capacity of the Feather river from Oroville to its confluence with the Yuba River to be 210,00 cfs; 300,000 cfs from the confluence with the Yuba River to the Bear River; and 320,000 cfs from the confluence with the Bear River to the Yolo Bypass (California Department of Water Resources 2010: 3-6; U.S. Army Corps of Engineers 2002b: 20).

Because of channel limitations of the Feather River near the Yuba River and below the Bear River, the maximum allowed release criterion for Oroville Dam is 160,00 cfs. Oroville Dam flood operations are defined by the release schedule provided in the operations manual (U.S. Army Corps of Engineers

[4] Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, Oroville Dam and Reservoir, Feather River, California, Report on Reservoir Regulations for Flood Control, August 1970.

[5] *Ibid* Department of the Army, Sacramento District, Corps of Engineers, Sacramento, California, Oroville Dam and Reservoir, Feather River, California, Report on Reservoir Regulations for Flood Control, August 1970.

DRAFT

1970). Operations are not to exceed the forecast flow upstream and downstream of the Yuba River. Structurally, the release gates can allow control releases of 250,000 cfs.

DWR has estimated that a 200-year storm event would require releases of 170,000 cfs from Oroville Dam and that a 500-year storm event would require releases of 250,000 cfs. [7]

Flood Frequencies on Feather River Indicate Increased Risk at Given Design Flow

The following statements are excerpts from DWR's Chief Hydrologist, subsequent to the 1997 Flood.

O6-D cont'd

The recent flood [1997] *again set new records on major Sierra rivers. When these are plugged into a frequency determination, the amount at a given frequency or the risk at given design levels will go up. We'll* [DWR] *introduce a* ***new round of charts and probably a bunch of determinations that the existing 100-year levels are not that anymore, but less****, and a new round of project work will be needed to provide revised 100-year flood protection, some in areas which have just done a lot of work. This is one of the problems with working on statistic based on relatively short record. Maybe for major projects we should go back to the old standard project flood idea or justify to some level of historical storm.* ***People are being misled by all these numbers and risks, not realizing how tentative they are and the rather large uncertainty involved****."* [Emphasis added]

The Feather River chart shows the comparison for Oroville dam. As noted before, this one [1997 Flood] ***was perhaps 25 percent bigger than 1986, which itself was the biggest to that time, although not too much more than a 1907 flood****.*[8] (p. 9) **[Emphasis added.]**

Response: The **Feather River has not experienced the Standard Project** Flood to date; and there are questions as to whether or not it has even experienced the so-called "100-year flood event"; notwithstanding floodwater releases have been equal to or in excess of the maximum allowable releases for the flood events to date. It is also important to note that DWR provides the floodwater release numbers to the USACE.

Conclusion: The impending time constraints prohibit P&A from elaborating on other significant issues and impacts associated with the proposed Project.

O6-E

Respectfully,

Patrick Porgans, Solutionist

[7] U.S. Army Corps of Engineers and Sutter Butte Flood Control Agency Draft Feather River West Levee Project EIS/EIR, December 2012, p. 3.1-10.

[8] Maurice Roos, Chief Hydrologist, CA Department of Water Resources, P.O. Box 219000, Sacramento, CA 95821-9000. Presented at the Sierra College California Weather Symposium, June 28, 1997 in Rocklin, CA, p. 9.

DRAFT

Response to Letter O6

O6-A

It is agreed that prior to European settlement in the mid-19th century, much of the floodwaters in the Sacramento Valley would overtop the natural banks of the rivers and flow into the basins adjacent to the river channel. These flow patterns were later largely adopted into the Sacramento River Flood Control Project as the bypass system in place today.

O6-B

This comment has two primary issue areas. The first and most substantial is the assertion that historical flood patterns tended toward the west of the Feather River and that the FRWLP would reduce that potential and thereby potentially increase flood risk to the east. As discussed in the prior response, it is agreed that much of the floodwaters in the Sacramento Valley would overtop the natural banks of the rivers and flow into the basins adjacent to the river channel. Catastrophic floods from the Feather River have tended toward the west; however, SBFCA has conducted a thorough analysis, including review by independent, third-party experts and technical review by USACE, California Department of Water Resources (DWR), and the Central Valley Flood Protection Board [CVFPB]—the agencies for which this is part of their permitting authority and mission—and no issues have been identified with increased or transferred risk that may result from the FRWLP. Similarly, the agencies with flood management responsibilities adjacent to and downstream of the project have not raised any objections to its implementation. To reduce regional flood risk beyond the FRWLP, as the next phase of the Central Valley Flood Protection Plan, SBFCA is collaborating with partners on both sides of the river in the Feather River Regional Flood Management Plan to develop a mutually agreed upon and mutually beneficial framework to reduce flood risk for all communities in the region. SBFCA is a co-lead agency along with Three Rivers Levee Improvement Authority, Yuba County, Yuba County Water Agency, and the Marysville Levee Commission. In regard to the second part of the comment, it is regretted that the commenter's clients did not receive direct notice. Nonetheless, the project was noticed per the requirements of NEPA and CEQA, and it is appreciated that the commenter's client's perspective is represented and it is being considered.

O6-C

It is agreed that certain measures and alternatives that were screened out and not carried forward in the FRWLP have merit for further investigation in the opinion of SBFCA, including those mentioned in the comment. The screening of the alternatives involving bypasses and reservoirs was primarily determined by the ability of SBFCA to pursue these measures within SBFCA's authority and means; the availability of studies to refine the concept, analyze the feasibility and effectiveness, and determine other effects; and the ability to implement the alternative quickly and cost-effectively to meet Federal and state flood management criteria. Moreover, implementation of these alternatives would not address documented system deficiencies that have directly contributed to levee failure and catastrophic floods on the west levee in multiple events over the past 100 years. This is also true for dredging. Therefore, while these alternatives do not meet the purpose, need, and objectives for the FRWLP, SBFCA is continuing to investigate these ideas beyond the FRWLP toward comprehensive regional flood-risk reduction. Specifically, as the next phase of the Central Valley Flood Protection Plan, SBFCA is collaborating with partners on both sides of the river in the Feather River Regional Flood Management Plan to develop a mutually agreed upon and mutually beneficial framework to reduce flood risk for all communities in the region. SBFCA is a co-lead agency along

with Three Rivers Levee Improvement Authority, Yuba County, Yuba County Water Agency, and the Marysville Levee Commission. One specific element of the comment seems to assert that the FRWLP may induce greater risk to other communities. SBFCA has conducted a thorough analysis, including review by independent, third-party experts and technical review by USACE, DWR, and CVFPB—the agencies for which this is part of their permitting authority and mission—and no issues have been identified with increased or transferred risk that may result from the FRWLP. Similarly, the agencies with flood management responsibilities adjacent to and downstream of the project have not raised any objections to its implementation. Comment did not necessitate change to the Final EIS.

O6-D

The comment as stated in the introduction essentially asserts that the design, operations, and maintenance of Lake Oroville and the Feather River influence flooding on the east side of the river. The east side of the river is not part of the project and is in the scope of the analysis only on a limited basis for determination of hydraulic effects. It has been determined that the project would have no significant effects on the east side of the river. The information and detail in the comment is appreciated and SBFCA will consider this information in development of the Feather River Regional Flood Management Plan.

O6-E

The commenter's interest in the project and participation through submittal of comments is appreciated. It should be noted that the comment period for the project was greater than the 45 days required under NEPA and CEQA. Comment did not necessitate change to the Final EIS.

Chapter 4
Comments from Individuals and Responses

This chapter contains the comments received on the Draft EIS/EIR from individual citizens and stakeholders. Each comment letter has been assigned a unique code. Each comment within the letter has also been assigned a unique code, noted in the margin. For example, the code "I1-A" indicates the first distinct comment (indicated by the "A") in the first letter (indicated by the "A1") received from an individual (indicated by the "I"). The chapter presents each comment letter immediately followed by the responses to that letter. Table 4-1 summarizes the commenting party, comment letter signatory, and date of the comment letters.

Table 4-1. List of Comment Letters from Individuals

Letter	Comment Letter Signatory, Date	Letter	Comment Letter Signatory, Date
I1	Francis Coats, December 23, 2013	I16	Francis Coats, March 18, 2013
I2	Francis Coats, December 23, 2013	I17	Bob Hackamack, December 26, 2012
I3	Francis Coats, December 29, 2013	I18	John M. Kuster, December 27, 2013
I4	Francis Coats, January 9, 2013	I19	Al Sawyer, January 16, 2013
I5	Francis Coats, January 9, 2013	I20	Vincent Hamilton, January 16, 2013
I6	Francis Coats, January 9, 2013	I21	Vincent Hamilton, January 16, 2013
I7	Francis Coats, January 19, 2013	I22	Michael C. Andrews, January 17, 2013
I8	Francis Coats, January 23, 2013	I23	Sharron Cosker, January 19, 2013
I9	Francis Coats, January 23, 2013	I24	Sharron Cosker, January 25, 2013
I10	Francis Coats, February 6, 2013	I25	Carl Cilker, January 28, 2013
I11	Francis Coats, February 7, 2013	I26	Jeff Fredericks, February 12, 2013
I12	Francis Coats, February 11, 2013	I27	Eugene A. Kreb, February 13, 2013
I13	Francis Coats, February 13, 2013	I28	Rick Walkling, February 15, 2013
I14	Francis Coats, March 2, 2013	I29	Edward C. Beedy, PhD, February 15, 2013
I15	Francis Coats, March 14, 2013		

Letter I1—Francis Coats, December 23, 2013

Letter I1

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Sunday, December 23, 2012 6:16 PM
To: FRWLP_Comments
Subject: 1863 relocation of the konkow maidu by co f 2nd Cal vol Infantry

I.1.2.1 is inaccurate.
The occupation of the valley lands by whites was close to complete by 1852, before gold miners turned to farming. Yes it happened that quickly.

I1-A

The maidu were not rounded up by local militia. The were rounded up by company f 2nd California volunteer cavalry, a more or less regular army unit which had been defending tame Indians from vigilantes for months prior. The officers had no idea why they were relocating the Indians as they were all owned by or employed by locals. Big land owners bidwell and sutter wanted to keep the Indians in the valley as they were a source of seasonal labor. Others wanted to kill all Indians not relocate them. See records of the war of the rebellion on google books. My great granffather's brother, Augustus Starr, was one of the officers. The troopers put indians on their horses to try to get them to nome cult alive. Hell of a story in more ways than one and you ought to get it right. Oh+ spell Starr Bend with two r's, please. I hope you did not pay much for your I accurate history. Us army reports tell the story. No mystery. Not hard to find.

Francis Coats 3392 Caminito Avenue Yuba City CA (530) 701-6116 fecoats@msn.com
Sent from my Kindle Fire

Response to Letter I1

I1-A

Comment noted. Please note that the purpose of this context is primarily to identify the basis for the significance of specific built environment and archaeological resources. The clarifications suggested by the commenter are important historical details; however because they do not relate to specific tangible resources they are not directly related to the purpose of this context. Comment did not necessitate change to the Final EIS.

Letter I2—Francis Coats, December 23, 2013

Letter I2

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Sunday, December 23, 2012 9:55 AM
To: FRWLP_Comments; Roberta Fletcher; jennifer.lucchesi@slc.ca.gov; thomaswilcox@digitalpath.net; megan@americanwhitewater.org; danielle@riversforchange.org; tbartlett@dfg.ca.gov; john@riversforchange.org; info@californiacavalry.us; bhackamack@frontier.com; grace95991@hughes.net; ajames@sc.edu; eric@maidu.com; raymcreynolds@yahoo.com; hsweetser@aol.com; brent.handley@tpl.org; sharman07@comcast.net; alan@alarsonsafety.com; hkruger@appealdemocrat.com; staff@tuolumne.org; johnsonsbait@syix.com; jpokrandt@riverpartners.org; josh2th@aol.com; patrick@tuolumne.org; frydee@comcast.net; ahurtado@ou.edu; ccreekin@yahoo.com; mphogan@ucdavis.edu
Cc: Dave Steindorf; Julie Fair; Helen Swaggerty; Mary Hays; jan Stevens
Subject: Feather River West Bank Levee Project EIS/EIR; the California Recreational Navigable Servitude

FRWLP_CommentsAysace.armu.mil

Friends:

I have just had a preliminary opportunity to review the draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Feather River West Levee Project. It omits any reference to the concerns for protection of the public's rights to use the rivers and the banks of the rivers for recreational purposes under the navigable servitude recognized in California, which I raised at the preliminary public meeting in Yuba City.

I2-A

[the report is available for inspection at :

http://www.spk.usace.army.mil/Media/USACEProjectPublicNotices.aspx

public meetings are scheduled:

Tuesday, January 15, Gridley
Gridley Veterans Memorial Hall
249 Sycamore Street
Gridley, CA 95948
time 6:00 pm to 8:00 pm

Wednesday, January 16, Yuba City
Veterans Memorial Community Building
1425 Veterans Memorial Circle
Yuba City, CA 95991
Time 3:00 pm to 5:00 pm (and)
6:00 pm to 8:00 pm

So as to avoid misunderstanding, please be aware that I live behind these levees, south of Yuba City, and I am completely in favor of improvements to achieve greater flood protection. I am a little cynical of improvements made to improve the use of the river as a conduit for shipping water outside of the basin, and feel strongly that the beneficiaries of water export should be paying for levee improvements made necessary by their water supply management practices. Also,

I2-B

I2-B cont'd

flood protection in Sutter County, particularly set-back levees increasing storage during peak flows, benefits Sacramento and points south, and they should participate in any costs (or loss of tax money) involved.

However, respecting the public's rights to use the river and the bottom-lands below highwater mark presents no conflict with flood protection. I would like to see a reasonable effort made to assure that poor planning does not result in infringements upon these rights.

I2-C

1. A navigable river, in California, is one susceptible to use for recreational navigation, even in small un-motorized boats. (People ex rel. Baker v. Mack 1971 19 Cal.App.3d 1040; National Audubon Society v, Superior Court 1983 33 Cal. 3d 419, 435 fn 17). Under this standard, the Feather River is navigable at least to some point in the Sierras above Oroville.
Note that there is a public boat ramp on the Feather at Live Oak, and, I believe, some boat ramps in Butte county, -a clear indication that the river is navigable throughout the project area.
1b. Under this standard, small tributary steams, such as Jack Slough at Marysville, Butte Creek in Butte and Sutter counties, and Butte Slough in Sutter County, are navigable and currently subject to a right of public access, both on the water and on the land below highwater mark adjacent to the stream.
2. Under the navigable servitude, members of the general public are entitled to use the river, and the land adjacent to the river up to the high-water mark, for boating, swimming, hunting, fishing, bird-watching, picnicking and in general recreational pursuits. That is, walking in the bottom lands, without ever entering the water, is a protected right which exists now.
3. The critical weakness to the recreational navigable servitude is that it may not provide access from public roads to the land below highwater mark, depending on the topography and land ownership patterns in a particular location. That makes it critical to identify and preserve those access routes. The EIS/EIR does not discuss access issues.
4. Given that levees and their associated toe drains, as well as fences and gates, block travel between the dry side of the levee and the wet side of the levee, it is foreseeable that a levee improvement or change may block existing access.
5. Some levee districts, Levee District No. 1, for example, have a policy of blocking public access to the river. At Starr Bend Road, LD1 has erected and maintains a locked gate blocking access from Garden Highway to the Feather River along an existing, formally created and never abandoned, public road. LD1 isa aware of this, having requested and been denied an abandonment of the road by the county. This road serves both publicly owned and privately owned land on the wet side of the levee, land some of which is below highwater mark and therefore subject to the navigable servitude.
6. Some state agencies fail to disclose opportunities for public access. Department of Fish and Game owns the Morse Road unit, and includes that unit in its Feather River Wildlife Area, but does not mention its existence in its website or publications (except for its formal regulations, in which it is included in the FRWLA and subjected to the general rules of the FRWLA).
7. The EIS/EIR is written as though there are discrete "recreation areas"

withing the project. In fact, the entire river and the land adjacent to the river and below the highwater mark, are recreation areas in which the public currently has a right to exercise the incidents of the navigable servitude. Any riprap, for example, will interfere with existing recreational use rights. If riprap interferes with walking along the river, perhaps an alternate route around the riprap must be provided.

8. The EIS/EIR is written as though recreation is an extra, which may be considered if it fits within the other considerations. Recreation use of the rivers and the land adjacent to the rivers below the highwater mark is a currently existing vested right which the project must accommodate. Public use is is not an optional extra.

9. The EIS/EIR reflects no attempt to identify routes of access to the river, to be preserved. Formally created public roads, including antique roads, and routes informally acquired by dedication should be identified and efforts taken to preserve the access.

10. Discussions of access are complicated by uncertainty as to who may own the right to permit or exclude access to the land upon which a levee sits. Many levees are build on easements, with the underlying landowner retaining ownership. The law may or may not respect the underlying landowner's claimed rights, depending on the facts of an individual case. At Second Street in Yuba City it seems well established that homeowners whose predecessor's interest granted an easment for levee construction but carefully reserved the right to exclude the general public from use of the levee for recreation purposes, have been successful. On the Bypass levee, case law indicates that the levee maintenance organization may exclude the underlying landowner from grazing sheep on the levee. That there may be an underlying landowner creates uncertainty as to the levee maintenance organization's ability to exclude the public from land which the levee maintenance organization may not own. This leaves the public in a vulnerable no-man's land. Many people won't challenge a "no trespassing," whether placed by a levee maintenance organization or a person claiming to be an underlying land owner. The public needs the EIS/EIR to address these issues regarding the extent to which the public may have a right to walk along or across the levees. These rights may vary from tract to tract.

I2-C cont'd

11. The EIR/EIS does not discuss river and bottomland/riverbank access for mobility impaired persons. There ought to be some evaluation of the degree to which the project will be ADA compliant in providing representative, fair access to the rivers.

12 Boat ramps. On the Feather, on the right (Yuba City) bank, there are boat ramps at Live Oak (Pennington), Yuba City (Mosquito Beach), and Boyd Pump. On the left bank there are boat ramps at Marysville (Riverside Park) and Starr Bend. The Feather is obstructed for boating at Paseo Road by the Sunset Weir, and at Yuba City by the rapids/falls. There are no boat ramps on the Feather from Starr Bend to its mouth on the Sacramento, so far as I know. In other words, access for canoeing or kayaking or floating is questionable. If you want to go downstream and pull out downstream, you have problem. There are no generally publicized pull-out points for rafts, canoes or kayaks below Starr Bend. I don't think there is a convenient,
signed portage route to get around the Sunset Weir.

I hope to have time to prepare a better and more complete statement regarding the EIR/EIS failure to address the effect of the project as proposed on the public's existing rights to use the rivers and the land adjacent to the rivers up to the

I2-C cont'd

highwater mark, and, on routes of access to the river and land adjacent to the river and below the highwater mark.

As a final note, I learned of the release of the draft EIR/EIS from an acquaintance who had attended a preliminary meeting in Gridley. I attended and spoke at the preliminary meeting in Yuba City. I was one of only two attendees at that meeting, and river access was the primary subject of my comments. My comments were not addressed in the draft documents, and I was not sent notice of the release of the documents. My acquaintance received a letter and a draft on CD. I wonder what happened. This is interesting because you have published an e-mail from me in the document - you knew I existed, and had expressed an interest in the document, and you had my address.

Thank you for your attention to these comments.

Frank Coats, 3392 Caminito Avenue, Yuba City, CA 95991 (530) 701-6116,
fecoats@msn.com

Response to Letter I2

I2-A

The commenter's concerns are reflected directly in the Draft EIS/EIR on page 1-29, Section 1.6.3.5, *River Access for Recreation*, which states: "The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor." SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limitations of access within the construction footprint and during the construction season for public safety. The recreation access analysis was supplemented after the Draft EIS/EIR to specify locations and distances to similar recreation opportunities to assist recreationists during the temporary loss of access caused by the project (beginning on page 3.14-9 under effect REC-1 for Alternative 1). As far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution to adopt an MOU on March 13, 2013, which specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study.

I2-B

The comment is understood to focus on the funding for the levee improvements. In fact, the project is expected to be predominantly paid for by monies made available by bonds authorized by the voters of California through Proposition 1E, administered by California Department of Water Resources (DWR) through a competitive process under which projects are evaluated for public benefit. These State-authorized funds will be leveraged by dollars raised through local assessment. Therefore, most of the financing for the project is paid for by Californians, including downstream

interests referenced in the comment. In regard to the element of the comment regarding the improvements being necessitated by water supply management practices, the circumstances are actually the opposite. The levee deficiencies present flood risk during the rainy season when water exports are at their lowest, coinciding with when the reservoirs are being managed at high release rates to allow for flood capacity rather than retaining water for later exports (counter to storage for water supply).

I2-C

Generally, it is agreed that the public has the right to use of the river and that the Feather River is navigable by small, recreational craft. There are public facilities providing for such access along the river corridor. It is further acknowledged that there are limitations to access along the river corridor, including locked gates, lack of signage, lack of developed put-in/take-out points for non-motorized craft, and lack of parking and other amenities. Although the public has the right to use navigable rivers of the state, this right is not absolute, and may be reasonably regulated in pursuit of other public trust purposes, including environmental needs. *Carstens v. California Coastal Com.* (1986) 182 Cal.App.3d 277, 289. This project would only replace gates in-kind as necessitated by construction and does not propose any new gates. No net reduction in public access will occur as a result of this project.

It is acknowledged that there are public lands in the river corridor, including those controlled by the State of California, that are not accessible for public use, or from which access to the river corridor is limited by locked gates, lack of signage, or lack of developed put-in/take-out points for non-motorized craft, and lack of parking and other amenities. However, the California constitution does not impose an affirmative duty on public agencies to develop additional public access where none currently exists. In particular, here, where any change to access is both temporary and incidental to the project, SBFCA does not have responsibility to address access issues predating the project when evaluating the proposed project, which is focused on flood risk-reduction measures to address documented levee deficiencies according to Federal and state criteria.

As to the responsibility of USACE and SBFCA to address these circumstances in the FRWLP EIS/EIR, the fundamental analytical premise under NEPA and CEQA is to assess the change that would occur as a result of the project. As discussed elsewhere in this response to comments, the FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. These types of temporary limitations on public access are consistent with the right of the public to access the State's navigable rivers. See, e.g., *City of Berkeley v. Superior Court (1980) 26 Cal.3d 515, 523-526*.

From the larger perspective of SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution to adopt an MOU on March 13, 2013, which specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study.

With regard to the specific points in the comment, Levee District (LD) 1 is indeed a member agency of SBFCA but represents only two of 13 votes. Any policy of LD 1 would not necessarily be the policy of SBFCA. The adoption of the MOU including provision of public access is evidence that SBFCA is an

independent decision-making body. With regard to the point about riprap, there is no riprap proposed as part of the proposed FRWLP.

In regard to the specific comments about access locations, land ownership, and accessibility by the disabled, as stated previously, SBFCA does not propose to change these circumstances as part of the FRWLP; these circumstances do not affect nor would they be affected by the FRWLP; and USACE and SBFCA are not obligated to describe these circumstances under NEPA and CEQA review for the FRWLP.

In regard to the notice of availability, it is deeply regretted that the commenter did not receive direct notice. The reason is that the notice was published, posted, and sent through direct mail—all adequate means under NEPA and CEQA—but not via e-mail. The sign-in sheet completed by the commenter at the scoping meeting shows only an e-mail address was provided. Efforts have been made to ensure that the commenter's perspective is heard and considered, including two meetings with SBFCA staff and consultants and consideration of comments submitted by the commenter up to the point of publication of the Final EIS and Final EIR. USACE will ensure that the commenter is included on the mailing list for future notice regarding this project and the Sutter Basin Feasibility Study.

Letter I3—Francis Coats, December 29, 2013

Letter I3

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Saturday, December 29, 2012 10:01 AM
To: FRWLP_Comments
Subject: What happened to the evening in yuba city scoping meeting

1. On June 27, 2011, there were two scoping meetings in Yuba City, one in the afternoon and one in the evening. I attended and spoke at the evening meeting, and I think I filled out a card for future notices.
In reviewing the EIS/EIR is see transcripts for speakers at the Yuba City afternoon meeting and for the speakers at the Gridley meeting, but none for the evening meeting. I also did not get notice of the availability of the EIS/EIR until I saw one somewhere else, and asked you for one, so it sounds like you lost the contact cards from the evening meeting.

I3-A So, what happened? Why is there no transcript of the speakers at the evening meeting included in the EIS? Why didn't I get notice of the EIS availability the first time around?

2. On the transcripts you show, I see the stenographer swearing under penalty of perjury that he/she swore the speakers in at a deposition. There was not deposition and the speaker were not required to take an oath (were they?). So, can you explain why the stenographer swore to this under penalty of perjury.

3. While we are on the subject of the stenographer: does he or she have a record of what was said by the speakers at the evening scoping meeting?

4. As you may be aware, on the already completed Starr Bend levee set-back, project money was spent to build gates which LD1 keeps locked, blocking public travel across the levee between the dry and the wet sides, at both Starr Bend Road and Tudor Roads, both of which are formally created public roads. There is no particular levee related purpose for the gates at Starr Bend Road, as there are also gates at this point blocking travel along the levee-top road. This both makes clear that there is a real risk that this project will block river access and maybe it suggests that this project has already been used by LD1 to block

I3-B cross levee river access.
so:
a. Is the already completed work at Starr Bend and Tudor Road the subject of this EIS/EIR?
b. Will project money be spent to build other gates which may be used in blocking access across the levee, where substantial work on the levee is anticipated?
c. What is the plan, if any, to assure that project money is not spent to block cross levee access?
d. If the plan is to allow the use of project money to build gates to block cross levee access, what is your justification for using taxpayer money to block taxpayer access to the river and the bottom lands?

Response to Letter I3

I3-A

There are two main concerns raised in this comment. One regards notification of the availability of the EIS/EIR and the second regards use of the stenographer. In regard to the notice, it is deeply regretted that the commenter did not receive direct notice. The reason is that the notice was published, posted, and sent through direct mail—all adequate means under NEPA and CEQA—but not via e-mail. Information related to the notice of availability as well as scoping meeting materials were also posted on SBFCA's web site (www.sutterbutteflood.org). The sign-in sheet completed by the commenter at the scoping meeting shows only an e-mail address was provided. Again, it is deeply regretted that there was not follow-up with the commenter to keep the commenter informed of the process. To make up for this circumstance, efforts have been made to ensure that the commenter's perspective is heard and considered, including two meetings with SBFCA staff and consultants and consideration of comments submitted by the commenter up to the point of publication of the Final EIS and Final EIR. In regard to the second part of the comment and use of the stenographer, the stenographer was hired for the purpose of taking individual oral comments as an alternative to providing written comments. This was the explicit purpose for and direction provided to the stenographer. The stenographer was not intended to record the meeting, its presentation, or any group dialogue, and no such record is available. This is a customary practice for scoping meetings. However, in light of the frustration over the circumstances from the scoping meeting, USACE and SBFCA's practice was changed for the public meetings on the Draft EIS/EIR and the stenographer was directed to record the meetings in their entirety. The transcripts are included in this document. It must be noted that the commenter's concerns were indeed heard and are reflected directly in the Draft EIS/EIR on page 1-29, Section 1.6.3.5, *River Access for Recreation*, which states: "The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor." Comment did not necessitate change to the Final EIS.

I3-B

In regard to the first issue about work already completed, it is not subject of this EIS. Second, project money may be used to replace existing gates but no new gates are planned. Comment did not necessitate change to the Final EIS.

Letter I4—Francis Coats, January 9, 2013

Letter I4

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Wednesday, January 09, 2013 2:39 PM
To: Jillian Bassett, CSR No. 13619
Cc: FRWLP_Comments
Subject: Transcript of 6/27/11 6:30 pm sutter basin & feather river west scoping meeting

I4-A | This is to confirm that you told me that you would inquire as to what might have happened to the record of the above meeting. The record of this meeting is missing from the eis/eir produced while other scooping comments appear.
Frank Coats 530-701-6116

Francis Coats 3392 Caminito Avenue Yuba City CA (530) 701-6116 fecoats@msn.com
Sent from my Kindle Fire

Response to Letter I4

I4-A

As described in the response to comment I3-A, there is no complete transcript of the meeting. The stenographer present at the meeting was hired for the purpose of taking individual oral comments as an alternative to providing written comments. This was the explicit purpose for and direction provided to the stenographer. The stenographer was not intended to record the meeting, its presentation, or any group dialogue, and no such record is available. Other comments are included from that meeting because they were submitted in written form or because commenters chose to provide individual oral comments to the stenographer. This is a customary practice for scoping meetings. However, in light of the frustration over the circumstances from the scoping meeting, SBFCA's practice was changed for the public meetings on the Draft EIS/EIR and the stenographer was directed to record the meetings in their entirety. The transcripts are included in this document. Comment did not necessitate change to the Final EIS.

Letter I5—Francis Coats, January 9, 2013

Letter I5

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Wednesday, January 09, 2013 5:11 PM
To: FRWLP_Comments; chris.elliott@icfi.com
Cc: ben vandermeer; Stan Cleveland cleveland; harold kruger
Subject: Why Frank Coats comments at 6/27/11 6:30 pm scoping meeting were not recorded

Re: Sutter Buttes Flood Control Agency's Feather River West Levee Project Environmental Process and Documents
Omission from the record of public comments regarding river access and given within scoping process

Friends:

Early on in the process of planning and developing environmental documents for this project, public meetings were held to give members of the public an opportunity to express their concerns and make their comments regarding the project. These are the four scoping meeting held on June 27, and June 28, 2011. Two meetings were held on June 27 in Yuba City, and two meetings were held on June 28 in Gridley.

When I looked at the record of the scoping meetings held in June of 2011 (see attachment C of the EIS/EIR), early on in the environmental review process, I notice that it contains a reporter's transcript of comments by Bob Barkhouse and Stan Cleveland, apparently given at the 3:30 meeting on June 27, 2011; and comments given by two other persons at meetings in Gridley the next day; but, no record of comments I made at the 6:30 pm meeting in Yuba City on June 27, 2011.

I5-A I asked the Corps of Engineers, SBFCA, and the consultants what happened and received no reply, so I called the reporter service.

I have heard from Laurie Gallagher, owner of Northern California Court Reporters, as to why my comments at the June 27, 2011, 6:30 pm Yuba City scoping meeting for the Feather River West Levee Project EIS/EIR do not appear in the documentation of the scoping meeting in the EIS/EIR Attachment C. Jillian Bassett, CSR, was present to record the comments made by participants in the meetings. Apparently the person (Ingrid Norgaard of ICF International) who was running the meeting told Bassett to record only what the person running the meeting wanted recorded; and, this person did not request that Bassett record anything from the 6:30 meeting. The consultant running the meeting for ICF International, the Corps of Engineers and the Sutter Butte Flood Control Agency, apparently did not think anything anyone said at the 6:30 meeting was worth recording, considering or responding to.

So, here we are, a year and a half later, reading an EIS/EIR which started with a defective scoping process and which does not consider or respond to substantive comments made by a member of the public at the scoping meeting, and with no record of the comments made. It also looks like this happened because someone made a conscious decision to exclude comments concerning river access from the record of the scoping process and from serious consideration during the remainder of the environmental planning process.

I5-A cont'd

My comments were essentially as follows:
1. The public presently has a right to be on the river and on the land adjacent to the river and below high water mark, for hunting, fishing, picnicking, bird-watching, doing cross-word puzzles, and other recreation pursuits. I was not asking anyone to further develop any of this land. It is fine the way it is.
2. The problem is getting access to the land where it drops below high water mark. I was asking that the project not interfere with the public's access to the land below high water mark - to not install gates and to not lock gates if installed. On further thought, also to keep at least as many ramps as currently exist, and in their current locations.
3. My concern was based on prior experience with Levee District Number One of Sutter County (LD1), a constituent agency of the joint powers agreement which is SBFCA, which installed gates and maintained those gates locked, blocking public access to the Feather River on Starr Bend Road and on Tudor Road, even though those two roads were both formally created public roads. So far as I can tell, LD1 has installed gates and maintains those gates locked on every ramp approaching its levee from the west/dry side, except for the two bridges at Yuba City, the Mosquito Beach trailer park, boat ramp and park in Yuba City, and at Boyd Pump boat ramp. Given that LD1 is the dominant levee district in the project, I am concerned that its policies may be adopted by the joint powers organization.
4. My concern included concern with river access for persons who do not own a boat, trailer and tow-vehicle, who are denied access to much of the river which is available through the use of the established boat ramps for persons with a boat, trailer and tow-vehicle.
5. Essentially, it appears that at least LD1 has taken it upon itself to disregard the rights of the general public, while accommodating those of private landowners on the wet side of the levee, by installing and locking gates to prevent access by the general public while permitting access by private landowners by providing them with keys.
6. When you build or re-work a levee, including possibly parallel ditches, drains and fences, you are going to have an effect on access. When you install or remove ramps, or install gates on ramps, you are going to affect access. The EIS/EIR does not describe what is planned with reference to its effect on access.

So there we have it. An apparently intentionally defective scoping process which fails to record comments regarding river access in order to avoid accountability for a defective planning process and a defective EIS/EIR.

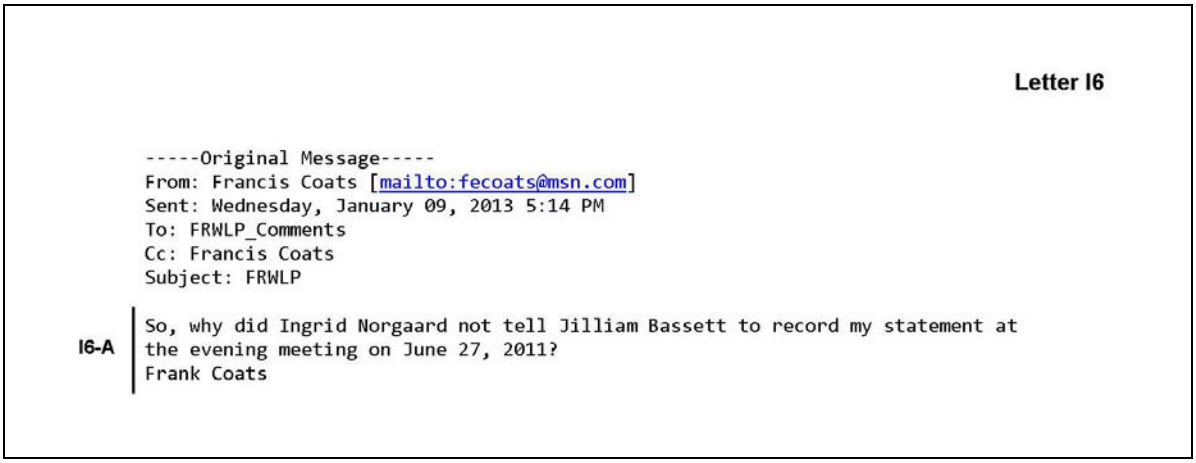
My comments may be addressed and dealt with within the planned time-lines. This is only a draft EIS/EIR, and there may time to fix it. But still, it looks like someone is playing Russian roulette with the public's money and safety. Screwing up an environmental document creates delay. Delay in heavy construction means money. For a levee project, it delay means a longer wait for better flood protection.

Response to Letter I5

I5-A

As described in the response to comments I3-A and I4-A, there is no complete transcript of the meeting. The stenographer present at the meeting was hired for the purpose of taking individual oral comments as an alternative to providing written comments. This was the explicit purpose for and direction provided to the stenographer. The stenographer was not intended to record the meeting, its presentation, or any group dialogue, and no such record is available. Other comments are included from that meeting because they were submitted in written form or because commenters chose to provide individual oral comments to the stenographer. This is a customary practice for scoping meetings. However, in light of the frustration over the circumstances from the scoping meeting, USACE and SBFCA's practice was changed for the public meetings on the Draft EIS/EIR and the stenographer was directed to record the meetings in their entirety. The transcripts are included in this document. It must be noted that the commenter's concerns were indeed heard and are reflected directly in the Draft EIS/EIR on page 1-29, Section 1.6.3.5, *River Access for Recreation*, which states: "The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor." As described in the response to comment I3-B, SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. As far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt an MOU that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study. Comment did not necessitate change to the Final EIS.

Letter I6—Francis Coats, January 9, 2013



Letter I6

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Wednesday, January 09, 2013 5:14 PM
To: FRWLP_Comments
Cc: Francis Coats
Subject: FRWLP

I6-A So, why did Ingrid Norgaard not tell Jilliam Bassett to record my statement at the evening meeting on June 27, 2011?
Frank Coats

Response to Letter I6

I6-A

As described in the response to comments I3-A, I4-A, and I5-A, there is no complete transcript of the meeting. The stenographer present at the meeting was hired for the purpose of taking individual oral comments as an alternative to providing written comments. This was the explicit purpose for and direction provided to the stenographer. The stenographer was not intended to record the meeting, its presentation, or any group dialogue, and no such record is available. Other comments are included from that meeting because they were submitted in written form or because commenters chose to provide individual oral comments to the stenographer. This is a customary practice for scoping meetings. However, in light of the frustration over the circumstances from the scoping meeting, USACE and SBFCA's practice was changed for the public meetings on the Draft EIS/EIR and the stenographer was directed to record the meetings in their entirety. The transcripts are included in this document. It must be noted that the commenter's concerns were indeed heard and are reflected directly in the Draft EIS/EIR on page 1-29, Section 1.6.3.5, *River Access for Recreation*, which states: "The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor." Comment did not necessitate change to the Final EIS.

Letter I7—Francis Coats, January 19, 2013

Letter I7

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Saturday, January 19, 2013 12:21 PM
To: m.bessette@sutterbutteflood.org; m.inamine@sutterbutteflood.org; chris.elliott@icfi.com; frwlp_comments@usace.army.mil
Subject: FRWLP

Thank you for the chance to speak to you at the meeting in Yuba City.

I7-A I am left with a sense that nothing was said. Mr. Inamine discussed the need for the levee repairs, and the focus of his work on getting those repairs done. I agreed that the repairs were necessary and urgently necessary. I said the project, particularly the installation of gates in light of the certain knowledge that DWR, LD1 and LD9 would maintain any gates installed in a locked closed position, would have a substantial effect on public access to a public use area/recreational resource ("the vast majority of the river," in the words of the document). None of you said anything about why gates were needed to achieve flood protection purposes, or under what authority they might be locked closed.

I7-B From my perspective, it appears that private landowners of land in the river bottoms are trying to achieve their private interest in excluding the general public from the river and its banks by adding them to the FRWLP and hoping no one notices that the private interest has nothing to do with flood protection.

I7-C I object to the adoption of the document in its current form: because it does not identify the river and banks of the river as a public use area and a recreational resource; because it does not recognize the practically certain cumulative effect of installing gates at the end of construction when prior experience shows that DWR, LD1 and LD9 will lock those gates closed to exclude the public from the vast majority of the river and its banks; and because it does not discuss mitigation of the adverse effect, as for example not installing the gates or locking the gates in an open position except when they are closed pursuant to a proper procedure taken by an agency authorized to regulate access to and use of the river and its banks.

I7-D In addition, if still don't have a satisfactory explanation of how it came about that my comments at scoping about the the basis for the general public's right to be on the river and its banks did not make it into the record and were not discussed; and, how it came about that the only person who appears the record to have requested notice of availability of the document did not get notice.

Please contact me if you would like to discuss this.

Frank Coats, 3392 Caminito Avenue, Yuba City, CA 95991 530-701-6116, fecoats@msn.co m

Response to Letter I7

I7-A

It is agreed that the focus of the project is flood-risk reduction and the repairs are urgently necessary. Because of this focus, the project is intended to be neutral to recreation. As discussed in the response to comment I3-B, SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. As far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt an MOU that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. Comment did not necessitate change to the Final EIS.

I7-B

As stated in the response to comment I3-B, SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. As far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt a memorandum of understanding (MOU) that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. Comment did not necessitate change to the Final EIS.

I7-C

The commenter's concerns are reflected directly in the Draft EIS/EIR on page 1-29, Section 1.6.3.5, *River Access for Recreation*, which states: "The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor." As discussed in the response to comment I3-B, SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. As far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt an MOU that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. Comment did not necessitate change to the Final EIS.

I7-D

As described in the response to comments I3-A, I4-A, I5-A, and I6-A, there is no complete transcript of the meeting. The stenographer present at the meeting was hired for the purpose of taking

individual oral comments as an alternative means to providing written comments. This was the explicit purpose for and direction provided to the stenographer. The stenographer was not intended to record the meeting, its presentation, or any group dialogue, and no such record is available. Other comments are included from that meeting because they were submitted in written form or because commenters chose to provide individual oral comments to the stenographer. This is a customary practice for scoping meetings. However, in light of the frustration over the circumstances from the scoping meeting, SBFCA's practice was changed for the public meetings on the Draft EIS/EIR and the stenographer was directed to record the meetings in their entirety. The transcripts are included in this document. In regard to the notice, it is deeply regretted that the commenter did not receive direct notice. The reason is that the notice was published, posted, and sent through direct mail—all adequate means under NEPA and CEQA—but not via email. The sign-in sheet completed by the commenter at the scoping meeting shows only an e-mail address was provided. Again, it is deeply regretted that there was not follow-up with the commenter to keep the commenter informed of the process. To make up for this circumstance, efforts have been made to ensure that the commenter's perspective is heard and considered, including two meetings with SBFCA staff and consultants and consideration of comments submitted by the commenter up to the point of publication of the Final EIS and Final EIR. USACE will ensure that the commenter is included on the mailing list for future notice regarding this project and the Sutter Basin Feasibility Study. Comment did not necessitate change to the Final EIS.

Letter I8—Francis Coats, January 23, 2013

Letter I8

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Wednesday, January 23, 2013 8:33 AM
To: Chris Elliott; m.bessette@sutterbutteflood.org; frwlp_comments@usace.mil
Subject: Fwd: RE: FRWLP

Appologies for premature sending of prior message. I am writing on a small device and it is too easy to hit the wrong key.

I meant to add:

However, if SBFCA now wants to raise maintenance and security, it needs to do so with detailed facts and quantified statements. With merely "maintenance and security" given as reason to delay meaningful discussion, you have left me with only the obvious to say.

SBFCA's vulnerable assets, pumps and equipment, are on the dry side of the levee and not exposed to any additional risk by public access to the wet side of the levee. A person who wants to drive on the unprotected levee bank can do so by driving up the dry side so public access to the river side over established ramps does not particularly enable this damage.

SBFCA's increased maintenance costs would be limited to increased wear on the ramps giving access. These ramps are already being used by private landowners for moving equipment. The need for increased maintenance seems speculative. If SBFCA believes it is significant, then details of the anticipated use and cost of maintenance should be provided.

I8-A

The risks which owners of property endure when the general public has access are significant, but they are not within SBFCA's mission. They don't affect the integrity of the levee and they are subject to regulation by the county or perhaps State Lands Commission, not SBFCA. Further they must accomodate the rights of the general public to be on the river and the adjacentent land below high water mark.

While these are issues subject to future discussion, they are also issues which must be dealt with in the EIR. They are also issues which until your note seemed to well within the discussion as outlined by SBFCA's statements and displays, and by the public notices given during the process. If SBFCA now wants to change the scope of the EIR process perhaps that should be made clear by a new set of public notices.

Again. These questions and issues are within the scope of the EIR process as described so far, were raised during the scoping process and the draft EIR should have had a meaningful discussion of them. If "maintenance and security," are issues today, I don't understand why they are not discussed in the draft EIR.

Looking forward to hearing from Chris.

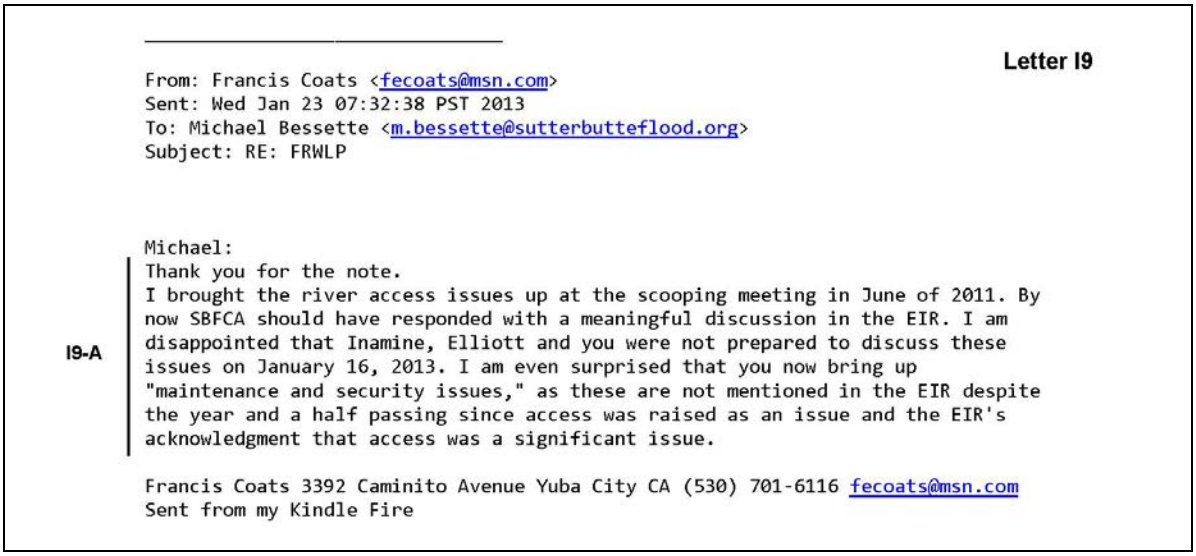
Frank Coats

Response to Letter I8

I8-A

The fundamental analytical premise under NEPA and CEQA is to assess the change that would occur as a result of the project. As described in the response to comment I3-B, SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. As far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt an MOU that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study. Comment did not necessitate change to the Final EIS.

Letter I9—Francis Coats, January 23, 2013



Letter I9

From: Francis Coats <fecoats@msn.com>
Sent: Wed Jan 23 07:32:38 PST 2013
To: Michael Bessette <m.bessette@sutterbutteflood.org>
Subject: RE: FRWLP

Michael:
Thank you for the note.
I brought the river access issues up at the scooping meeting in June of 2011. By now SBFCA should have responded with a meaningful discussion in the EIR. I am disappointed that Inamine, Elliott and you were not prepared to discuss these issues on January 16, 2013. I am even surprised that you now bring up "maintenance and security issues," as these are not mentioned in the EIR despite the year and a half passing since access was raised as an issue and the EIR's acknowledgment that access was a significant issue.

I9-A

Francis Coats 3392 Caminito Avenue Yuba City CA (530) 701-6116 fecoats@msn.com
Sent from my Kindle Fire

Response to Letter I9

I9-A

Starting with the big-picture perspective, as far as SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt an MOU that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study. It must be noted that the commenter's concerns were indeed heard and are reflected directly in the Draft

EIS/EIR on page 1-29, Section 1.6.3.5, *River Access for Recreation*, which states: "The Feather River is popular for recreation activities such as fishing, boating, walking, wildlife viewing, and other passive uses. There is demand to increase opportunities for public access to the river corridor." As described in the response to comment I8-A, the fundamental analytical premise under NEPA and CEQA is to assess the change that would occur as a result of the project. SBFCA does not plan to limit public access as part of this project or any other action. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. Comment did not necessitate change to the Final EIS.

Letter I10—Francis Coats, February 6, 2013

Letter I10

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Wednesday, February 06, 2013 7:40 AM
To: FRWLP_Comments
Cc: Chris Elliott
Subject: RE: Last day to receive comments on DEIR/DEIS for FRWLP?

I10-A SBFCA is telling people that public comments will accepted until February 13th. The December 20, 2012 notice of availability says February 11, 2013. Which is correct? If it has been extended how was the public informed of the change? Has the public been informed?
I don't think anyone told me, and I asked to be included in notices.
Frank Coats

Francis Coats 3392 Caminito Avenue Yuba City CA (530) 701-6116 fecoats@msn.com Sent from my Kindle Fire

Response to Letter I10

I10-A

From a big-picture perspective, comments are being considered by USACE and SBFCA up to the point of the final decision being made by each respective agency, and comments are being responded to in the Final EIS and Final EIR up to the point of publication. Specific to the comment, there had been an unintended discrepancy in the comment close date between the NEPA and CEQA notifications due to the administrative processes associated with each notice (February 13 and February 11, respectively). Consequently, the comment period was corrected on the CEQA side to match the NEPA close date of February 13. Per CEQA requirements, this correction was filed with the State Clearinghouse but was not distributed via individual noticing. As discussed above, in practice and reality, comments have continued to be accepted and responded to up to the point of publication of the Final EIS and Final EIR. Comment did not necessitate change to the Final EIS.

Letter I11—Francis Coats, February 7, 2013

Letter I11

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Thursday, February 07, 2013 8:17 AM
To: John Cain; FRWLP_Comments; Chris Elliott
Cc: Francis Edward Coats, Esq; David Steindorf
Subject: FRWLP Re: FW: Feather River DEIR changes to comment deadline

I11-A

Friends
As I have adequately whined already, written notice of availability was sent to me late. That is at the time I received written notice of the comment deadline being 2/11, someone had already changed it the date to 2/13. The information provided to all the people and entities to whom notice as sent is wrong? So someone hand picked who to tell about the correction? I think someone owes me an explanation of how is that SBFCA / USACE knew it sent incorrect information to me and to others, and made no effort to correct it.

Francis Coats 3392 Caminito Avenue Yuba City CA (530) 701-6116 fecoats@msn.com Sent from my Kindle Fire

Response to Letter I11

I11-A

As described in the response to comment I10-A, from a big-picture perspective, comments are being considered by USACE and SBFCA up to the point of the final decision being made by each respective agency, and comments are being responded to in the Final EIS and Final EIR up to the point of publication. There had been an unintended discrepancy in the comment close date between the NEPA and CEQA notifications due to the administrative processes associated with each notice (February 13 and February 11, respectively). Consequently, the comment period was corrected on the CEQA side to match the NEPA close date of February 13. Per CEQA requirements, this correction was filed with the State Clearinghouse but was not distributed via individual noticing. Specific to the comment, the discrepancy was not known until after the close date had been communicated because the noticing was processed differently between the State Clearinghouse in Sacramento for CEQA and the Environmental Protection Agency in Washington, DC, for NEPA. As discussed above, in practice and reality, comments have continued to be accepted and responded to up to the point of publication of the Final EIS and Final EIR. Comment did not necessitate change to the Final EIS.

Letter I12—Francis Coats, February 11, 2013

Letter I12

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Monday, February 11, 2013 12:45 PM
To: FRWLP_Comments
Subject: RE: FRWLP Re: FW: Feather River DEIR changes to comment deadline

Jeff:

I12-A

We have almost beaten this dead horse to a second death, but remember, you guys did not send me notice in the first round. I think you sent me notice and a copy of the CD after I e-mailed you on Sunday, December 23, 2012,asking why I had not received notice of availability. So, you guys knew the date had changed to the 13th when you sent me notice indicating it was the 11th. I may stilll have the envelope you sent the Cd and notice in, so I might have better confirmation of the timing.

I really think you owe mailed, or at least e-mailed, notice to the people who received the written notice, and, I don't think sending 400 post cards to an established mailing list is too burdensome given the importance of the subject to the people involved. Otherwise it looks like you treat one set of interested parties better than others: the people who regularly read the federal register over the people who ask for notice at the public hearings.

Response to Letter I12

I12-A

The comment is understood and it is regretted that the commenter did not receive notice in the first round. The reason for this is that the sign-in sheet from the public scoping meeting shows only an e-mail address and not a physical address for the commenter. As described in response to comment I10-A and I11-A, from a big-picture perspective, comments are being considered by USACE and SBFCA up to the point of the final decision being made by each respective agency, and comments are being responded to in the Final EIS and Final EIR up to the point of publication. There had been an unintended discrepancy in the comment close date between the NEPA and CEQA notifications due to the administrative processes associated with each notice (February 13 and February 11, respectively). Consequently, the comment period was corrected on the CEQA side to match the NEPA close date of February 13. Per CEQA requirements, this correction was filed with the State Clearinghouse but was not distributed via individual noticing. Specific to the comment, the discrepancy was not known until after the close date had been communicated to the commenter because the noticing was processed differently between the State Clearinghouse in Sacramento for CEQA and the Environmental Protection Agency in Washington, DC, for NEPA. As discussed above, in practice and reality, comments have continued to be accepted and responded to up to the point of publication of the Final EIS and Final EIR. Comment did not necessitate change to the Final EIS.

Letter I13—Francis Coats, February 13, 2013

Letter I13

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Wednesday, February 13, 2013 5:07 PM
To: FRWLP_Comments
Cc: Dave Steindorf; John Cain; Mary Hays; Tina Bartlett; jennifer.lucchesi@slc.ca.gov; thomaswilcox@digitalpath.net; ereimondo@americanrivers.org; megan@americanwhitewater.org; danielle@riversforchange.org; john@riversforchange.org; info@californiacavalry.us; bhackamack@frontier.com; grace95991@hughes.net; jss1934@yahoo.com; ajames@sc.edu; eric@maidu.com; raymcreynolds@yahoo.com; hsweetser@aol.com; brent.handley@tpl.org; sharman07@comcast.net; alan@alarsonsafety.com; hkruger@appealdemocrat.com; staff@tuolumne.org; johnsonsbait@syix.com; jpokrandt@riverpartners.org; josh2th@aol.com; patrick@tuolumne.org; frydee@comcast.net; ahurtado@ou.edu; ccreekin@yahoo.com; mphogan@ucdavis.edu
Subject: Frank Coats' Comments on FRWLP DEIR/DEIS

Please find attached my written comments on the Feather River West Levee Project Draft Environmental Impact Report/Statement.

In general my comments request that the document include a description of the recreational navigable servitude giving members of the general public the right to be on the river and on the temporarily dry river bed up to the ordinary annual high water mark; and, that the project not interfere in the general public taking that access. In particular, I do object to any suggestion that this project, cumulatively with the prior history of levee construction, will not have a significant adverse effect on public access to a major recreational resource. This project will, at least, reinstall gates where gates currently exist, and Levee District Number One of Sutter County and the Department of Water Resources will lock those gates.

Frank Coats, 3392 Caminito Avenue, Yuba City, CA 95991 (530) 701-6116, fecoats@msn.com

Letter I13
Attachment

Francis E. Coats
3392 Caminito Avenue
Yuba City, CA 95991
(530) 701-6116
fecoats@msn.com

January 19, 2013

U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814
Contact: Jeff Koschak

Sutter Butte Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991
Contact: Mike Inamine

ICF International
640 K Street, Suite 400
Sacramento, CA 95814
Contact: Chris Elliott
916.737.3000

(Sent by Email to Comments@FRWLP_usace.army.mil)

Comments on the Feather River West Levee Project (FRWLP), Draft Environmental Impact Statement / Environmental Impact Report (EIS/EIR), dated December 2012

Introduction:

I13-A I object to the adoption of the EIS/EIR in the form made available for public comment for the reasons given below. I am asking that you describe the navigable servitude in the document where you discuss laws affecting the project; that you include the lands subject to the navigable servitude in your consideration of the effect of the project on public lands and access to recreational resources; and, that your plan reflect steps taken to assure that any gates you install are not used to obstruct public access to the river and the land along the river, except when ordered closed by an appropriate agency following an appropriate process. This would have no effect on the flood-safety aspects of the project.

I13-B Members of the general public have a right to be on the river and on the dry river bed up to the ordinary high water mark. The Sutter Butte Flood Control Agency and each of its constituent agencies has an obligation to not unnecessarily interfere with public access to the river and it bed. The construction of the levees generally obstructed access between the dry lands and the wet lands. This obstruction is mitigated by the ramps providing access across the levees. This project includes installing gates on ramps which otherwise provide access across the levees between the dry land and the wet land. Prior experience with Department of Water Resources and Levee District One of Sutter County indicates that once the gates are installed, the levee maintenance organization will lock the gates, obstructing public access to the river and the river bed. It also appears that these entities will permit access by landowners

I13-B cont'd

to the river bottoms, while excluding the general public. The SBFCA and the levee maintenance organizations have no authority, and no need, to obstruct the general public's access to the navigable servitude lands.

Substantive Comments:

I13-C

The draft Environmental Impact Statement and Environmental Impact Report is inadequate in that it fails to identify the lands adjacent to the Feather River and below average high water mark as a public use area and as a recreational resource; and, because the EIS/EIR fails to adequately deal with the adverse effects of the project, direct and cumulative, on public access to the resource.

I13-D

1. The Feather River is navigable from its mouth on the Sacramento to Thermalito Afterbay, and in any case throughout the Feather River West Levee Project area. Members of the general public have the right to navigate and to exercise the incidents of navigation in a lawful manner at any point below high water mark within the project area.
    a. Members of the public have the right to navigate and to exercise the incidents of navigation in a lawful manner at any point below high water mark on waters of this state which are capable of being navigated by oar or motor-propelled small craft. The incidents of navigation include but are not limited to boating, swimming, fishing, hunting and all recreational purposes. *People ex rel. Baker v. Mack,* (1971) 119 Cal.App.3d 1040. A waterway usable only for pleasure boating is nevertheless a navigable waterway and protected by the public trust (citations omitted) *National Audubon Society v. Superior Court of Alpine County* (1983) 33 Cal.3d 419, footnote 17. In California "high water mark" means the ordinary high water mark *Ross v. Burkhard Inv. Co,* (1928) 90 Cal.App. 201; and, ordinary high water mark means the average level of high water attained by the river in its annual seasonal flow *People v. Ward Redwood* (1964) 225 Cal.App.2d 285.
    b. The public agencies involved in this project, including the SBFCA and each of its constituent agencies, are subject to the public trust doctrine.

        The trust is not merely a passive doctrine, but there is an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect the public trust uses whenever feasible." "Unnecessary and unjustified harm to trust interests" should be avoided. *National Audubon Society v. Superior Court (1983) 33 Cal.3d 419, 446-447.* This test is applied more stringently in the context of the navigable servitude than it is in water allocation. See Applying the Public Trust Doctrine to River Protection, by Jan S. Stevenson, University of California at Davis, June 9, 2004, printed at California Water Plan Update 2005, Volume 4, pp. 4-393.
    c. The Feather River is navigable by oar or motor powered small craft throughout the project area. There are public boat ramps maintained at SR 162 near Gridley, Pennington Road near Live Oak, Marysville at River Front Park, Yuba City at Mosquito Beach, south of Yuba City at Boyd Pump, and south of Marysville at Starr Bend. In

Francis Coats' Comments on Feather River West Levee Project (FRWLP) EIS/EIR,
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I13-D cont'd

general the EIS/EIR confirms recognition of the use of the Feather River throughout the project area for recreational boating.[1]

d. As a consequence of the above and supported by in the EIS/EIR at 3.14.2.2, the Feather River and the banks of the Feather River up to their average high water mark are a single continuous public use area and significant recreational resource.[2]

I13-E

2. The installation of gates on the levee will, cumulatively have a significant adverse effect on public access to the recreational resource and public use area. Access to the Feather River from the dry side of the levee is obstructed by the levees. It is illegal to climb the levees other than at ramps, because climbing the unprotected bank of the levee may cause erosion and damage the levee. This obstruction of access to the river and its banks is mitigated by the presence of ramps providing a means of crossing between the lands on the wet side of the levee and lands on the dry side of the levee. These ramps generally are currently obstructed by gates which are almost always maintained locked closed by levee maintenance organizations (Department of Water Resources (DWR), Levee District Number One of Sutter County (LD1), Levee District Number Nine of Sutter County (LD9)). Each of these entities is a California public agency. DWR is an "authorizing stakeholder" in the project, and LD1 and LD9 are constituent parties to the Sutter Butte Flood Control Agency joint powers agreement. The levee, gates and the practices of maintaining the gates locked closed are pre-existing facts which must be considered a cumulative with the effects of this project. The pre-existing practice of keeping the gates locked closed is a good indicator that the levee maintenance organizations will keep the gates locked closed after the project is completed, which also must be considered as a cumulative effect of the project.[3]

I13-F

3. The SBFCA and the levee maintenance organizations have no authority to determine whether or not the public should have access to the river and its bed. The SBFCA exists to refurbish the levees for flood safety. The levee maintenance organization exist to maintain the levees for flood safety. Neither has any authority to regulate public recreational use of the river and the river bed. This authority is with State Lands Commission, and to some extent the County.

I13-G

4. The SBFCA and the levee maintenance organizations have no need to keep the public out of the river and river bed. The presence of the general public on the river and on the river bottom lands on the wet side of the levee presents no threat to the integrity of the levees. There is no

[1] Kayaking and canoeing is occasionally favored in portions of the river. Boat ramps are distributed approximately every 7 miles along the Feather River between Thermalito Afterbay and the Sutter Bypass. ... Fishing is another popular recreation activity throughout portions of the corridor. Anglers fish from boats and the shore throughout the reaches of the river. 3.14.2.2.

[2] At 3.4.2.3 (3.4-7) the EIS/EIR states that the Feather River is considered navigable for the 28 miles from the mouth of the river to the railroad bridge at Marysville. This is misleading, and is not true for purposes of discussing the right of the general public to be on the river and on the banks of the river to the average high water markThe same paragraph states that there are no boat ramps in the project area, when the Boyd Pump boat ramp immediately adjoins the water side toe of the levee.

[3] The document already recites that access to the river is restricted and controlled throughout its length, with some access provided at parks, boat ramps, and Department of Fish and Wildlife units; and, that there is very little access of any sort north of Yuba City.

I13-G cont'd

equipment maintained on the wet side of the levee. Those people who would drive up the levee banks may do so whether or not the general public has access to the river bottoms.

I13-H

5. The maintenance of gates on the levee has an adverse effect on environmental justice issues. The entire river and its banks are accessible to those with boats, boat trailers and tow vehicles. Those without these assets must rely on access from the land side of the levee. Blocking land side access affects poor people and disabled people much more that it affects able bodied people who can afford boats, trailers and tow vehicles.

I13-I

6. In obstructing general public access, the gates are and will be used to discriminate between persons owning land in the river bottoms and members of the general public. In general the levee maintenance organizations provide keys to persons owning land in the river bottoms, and do not provide keys to the general public. As the general public has right to be in the river bottoms for recreational purposes, the discriminatory practice is not justified.

I13-J

7. The SBFCA simply does not have the information necessary to determine whether there are any legal barriers to allowing the public to cross the levees. The SBFCA simply has not done the work of reviewing and interpreting title documents, theestablishment of roads, and the dedication of routes of access, that would serve as a bases for determining, at any particular point on the levee, that the public cannot be allowed to cross. There is no discussion of river access rights other than those at parks, DFW wildlife areas and boat ramps. At 3.14.2.1, (3.14-3), the EIS/EIR identifies access routes to the river as including the units of the FRWA, local parks, and the Audubon sanctuary. The EIS/EIR neglects to mention public roads leading to the river, including Starr Bend Road and Tudor Road; and neglects to discuss even the possibility of the existence of routes established by dedication. This is understandable in the context of LD1's gating and locking of Starr Bend Road and Tudor Road absent any legal basis, and its subsequent denial of the public nature of these roads. Further, the EIS/EIR does not discuss the fact that in some areas the wet side levee toe is below average high water mark, suggesting that if member of the public can get across the levee, he or she will then be within the navigable servitude area. Further, the facts of the obstruction of Starr Bend Road and Tudor Road by Levee District Number One suggests that the credibility of a levee district in reciting that there is no access may be in question. Certainly the credibility of LD1 is in question.[4] Also note that the statement that there are no boat ramps in the project area appears to be false, as the Boyd Pump boat ramp is immediately adjacent to the existing levee itself.

At 3.14-4 the EIS/EIR states:

[4] 3.4.2. Navigation in the project area is confined to the Feather River, which runs adjacent to the project levees on their eastern side. The Feather River is considered navigable for the 28 miles from the mouth of the river to the railroad bridge at Marysville. The width and depth of the river vary greatly, and traffic is limited to recreational watercraft. There are no marinas or boat ramps in the project area. However, Yuba City has a boat ramp between the levee and the river, where the levee is set back several hundred feet from the water, and there is also a boat ramp at the end of Pennington Road that is between the project area and the river. *(Note, Pennington, Mosquito Beach, and Boyd Pump boat ramps are on the right bank, between the river and the levee.)*

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I13-J cont'd

> Fishing is another popular recreation activity throughout portions of the corridor. Anglers fish from boats and the shore throughout the reaches of the river.

At 3.14-9 and 3.14.10 the EIS/EIR states:

> There would be no change in permanent access since levee access is restricted and controlled for the vast majority of the project area.

To the extent that levee access is restricted and controlled this is largely by the levee maintenance organizations, (DWR, LD1 and LD9), each a DWR is an authorizing stakeholder and LD1 and LD 9 are constituent members of SBFCA. Public agencies, such as DWR, LD1 and LD9, as well as SBFCA, have a legal obligation to protect the public's interest in the navigable servitude and in access to the river.

I13-K

8. The EIS/EIR fails to identify what access there may be, while it states that there is little public access north of Yuba City, and that access is restricted and controlled throughout the vast majority of the project area. The EIS/EIR is not specific as to what these statements means. I would agree that in fact access is obstructed by locked gates and no trespassing signs. I would not agree that these are legally enforceable without a case by case investigation involving a review of the state of real property title, determination of the areal extent of the navigable servitude in the location, and a review of the prior history of public use of the route. LD1 obstructs Starr Bend Road even though LD1 is aware that Starr Bend Road is a formally established county road. The presence of a locked gate or a no trespassing sign is not a reliable indication that the route is not legally viable. However, the continued obstruction of a route tends to discourage public use and to make it more difficult to re-open the route.

I13-L

9. Any adverse effect on recreation and access to recreational areas could be mitigated by continuing in place the current ramps or functional equivalents in the approximate same locations; and, by not erecting gates on cross-levee ramps; or, by locking the gates in an open position.

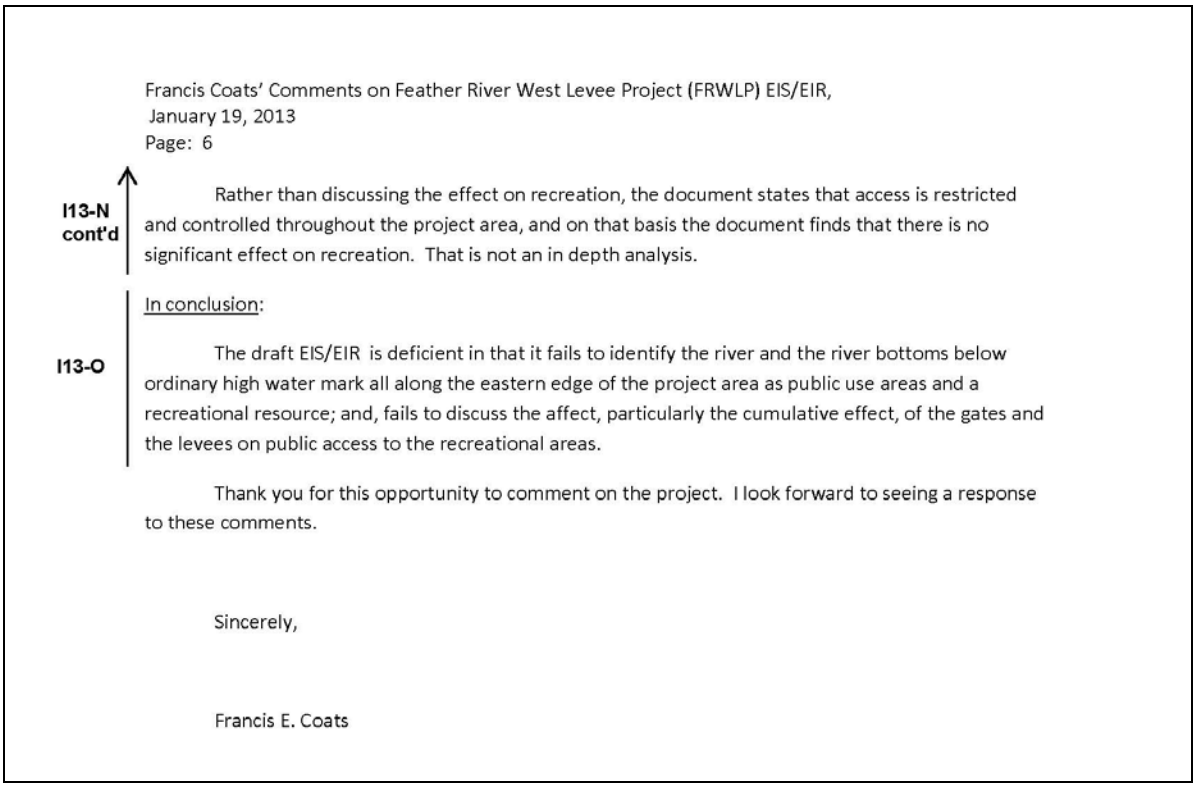
I13-M

10. Of particular concern are the ramp at Morse Road, the two ramps from the levee near Morse Road to the Morse Road Unit of the Feather River Wildlife Area, and the levee-top road connecting these ramps. The Morse Road Unit is open for public use. It is served by these ramps. If they are not maintained I place, and if travel over them and the levee top road that connects them is not continued, the public will have no access to the Feather River, the banks of the river, and the bought, paid for, and formally established public wildlife area.

I13-N

11. The notice for the FRWLP printed in the Federal register in 2011 indicated that the EIS/EIR would address recreation (see appendix b, attachment a):

> b. Significant issues to be analyzed in depth in the environmental documents include effects on hydraulics, wetlands and other waters of the U.S., vegetation and wildlife resources, special-status species, aesthetics, cultural resources, recreation, land use, fisheries, water quality, air quality, transportation, and socioeconomics; and cumulative effects of related projects in the study area.



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I13-N cont'd

Rather than discussing the effect on recreation, the document states that access is restricted and controlled throughout the project area, and on that basis the document finds that there is no significant effect on recreation. That is not an in depth analysis.

I13-O

In conclusion:

The draft EIS/EIR is deficient in that it fails to identify the river and the river bottoms below ordinary high water mark all along the eastern edge of the project area as public use areas and a recreational resource; and, fails to discuss the affect, particularly the cumulative effect, of the gates and the levees on public access to the recreational areas.

Thank you for this opportunity to comment on the project. I look forward to seeing a response to these comments.

Sincerely,

Francis E. Coats

Response to Letter I13

I13-A

As described in the response to comment I2-C, generally, it is agreed that the public has the right to use of the river and that the Feather River is navigable by small, recreational craft. It is further acknowledged that although there are public facilities available for providing access to the river corridor, access to the river is limited at certain points along the river corridor by gates, lack of signage, and lack of developed access points.

However, the proposed project does not contemplate any change to the current public access regime, except in temporary adaptations for safety. As further described in the response to comment I2-C, the public's right to access the Feather River corridor is not unlimited, and as a practical matter the public's ability to access the corridor will not change as a result of the proposed project. SBFCA does not have responsibility to address existing issues as part of its proposed project, the scope of which includes only flood risk-reduction measures to address documented levee deficiencies according to Federal and state criteria.

SBFCA does not plan to limit public access as part of this project or any other action. From the larger perspective of SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA has committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt a memorandum of understanding (MOU) that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study.

With respect to the specific comment regarding gates, the FRWLP proposes to replace gates in-kind that would be affected by the project and no new gates are proposed. However, the project does not propose to change the manner in which these gates are operated and therefore there would be no change to the existing condition as a result of the project and the project would have no direct or cumulative effect. The commenter's concerns are understood but are out of the scope of the FRWLP and its EIS/EIR. However, as stated previously, SBFCA is committed to investigating public access beyond the FRWLP as demonstrated through adoption of the MOU. In regard to the specific elements of the comment, relevant text has been added to the Final EIS and EIR under Section 3.14.2.1, *Regulatory Setting*, applying language from both the U.S. and California constitutions establishing navigable servitude.

I13-B

Please refer to the response to comment I13-A.

I13-C

Please refer to the response to comment I13-A.

I13-D

It is agreed that the Feather River is navigable, depending on flow in the river, the type of craft, and skill of the operator. For the purposes of Section 10 of the Rivers and Harbors Act, the Feather River is considered navigable up to the Marysville Railroad Bridge (this information can be found at http://www.spk.usace.army.mil/Missions/Regulatory/Jurisdiction/NavigableWatersoftheUS.aspx). Beyond Section 10, it is well established that the Feather River is navigable in practice by small recreational craft throughout the study area (with Thermalito Afterbay as the northern project extent) and there are public boating facilities to support such use. For the remainder of the comment, please refer to the response to comment I13-A. Comment did not necessitate change to the Final EIS.

I13-E

Please refer to the response to comment I13-A.

I13-F

As discussed elsewhere in this response to comments, the FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. These types of temporary limitations on public access are consistent with the right of the public to access the State's navigable rivers. See, e.g., *City of Berkeley v. Superior Court* (1980) 26 Cal.3d 515, 523-526. Because the fundamental analytical premise under NEPA and CEQA is to assess the change that would occur as a result of the project, the commenter's concerns about the existing access conditions on the site are beyond the scope of this review. SBFCA remains committed to investigating opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt an MOU that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. As further demonstration of commitment

toward advancing recreation, SBFCA also commissioned and completed a recreation study as part of the Sutter Basin Feasibility Study. Comment did not necessitate change to the Final EIS.

I13-G

Please refer to the response to comment I13-F.

I13-H

Please refer to the response to comment I13-F.

I13-I

Please refer to the response to comment I13-F.

I13-J

Please refer to the response to comment I13-A. SBFCA acknowledges that there are some points of access along the levees, and other points along the levees where access is restricted. Nonetheless, because no part of the project contemplates restricting permanent access beyond the current status quo, this access regime is part of the project setting, and does not require additional analysis under NEPA or CEQA. Similarly, as to the commenter's concerns about the "possibility of routes established by dedication" that allow access to the levee, the commenter's concerns are understood but are out of the scope of the FRWLP and its EIS/EIR, which is focused solely on flood-risk reduction measures, not on instituting or establishing new methods of access.

SBFCA acknowledges that the State of California holds all of its navigable waterways and the lands lying beneath them "as trustee of a public trust for the benefit of the people," and that agencies are to manage these lands in a fashion consistent with that authority. *Colberg, Inc. v. State ex rel. Dept. of Public Works* (1967) 67 Cal.2d 408, 417. SBFCA additionally acknowledges that a public agency's power to regulate navigable waterways within the terms of the public trust is absolute except as limited by the paramount supervisory power of the Federal government over navigable waters. *Colberg, Inc. v. State ex rel. Dept. of Public Works* (1967) 67 Cal.2d 408, 417. A public agency may regulate the public's use of a navigable waterway in favor of other public trust purposes, including environmental needs. *Carstens v. California Coastal Com.* (1986) 182 Cal.App.3d 277, 289. A public agency's efforts to reclaim land and provide for flood risk management are one such permissible public trust purpose. *Gray v. Reclamation District No. 1500* (1917) 174 Cal. 622, 637. Here, to the extent that access is temporarily limited, it is within SBFCA's authority to do so.

In regard to specific issues in this comment, it should be noted that the ordinary high water mark (OHWM) does not engage the levee toe within the study area. Based on topography and the width of the floodplain in the study area, the OHWM as regulated by USACE is a considerable distance from the levee for the vast majority of the study area. The commenter is correct that there were inconsistencies between Chapter 3.4 and Section 1.14 regarding boating facilities. The text in Section 3.4.2.3 has been corrected (page 3.4-7) and the comment pointing to the inconsistency is appreciated.

I13-K

Please refer to the response to comment I13-A.

I13-L

Please refer to the response to comment I13-A.

I13-M

Please refer to the response to comment I13-A.

I13-N

Please refer to the response to comment I13-A.

I13-O

Please refer to the response to comment I13-A.

Letter I14—Francis Coats, March 2, 2013

Letter I14

-----Original Message-----
From: Francis Coats [mailto:fecoats@msn.com]
Sent: Saturday, March 02, 2013 10:32 AM
To: Michael Bessette; Mike Inamine; Chris Elliott; FRWLP_Comments
Subject: Preserving Starr Bend Road frwlp

Friends:

I heard a rumor that SBFCA and DWR are discussing the abandonment of Starr Bend Road with Sutter County. If that is taking place, I am disappointed. Starr Bend Road is one of the very few points of potential near river access left. It is critical to preserving the general public's access in order to give meaning to the general public's right to engage in recreational activity on the river and on the banks of the river below high water mark. The activities of the public in the river bottoms are of no concern to the flood control agencies unless they present an actual risk to the flood control operations. So long as the public takes access over appropriate ramps, as exist at Starr Bend, there is just no reason for SBFC and DWR to pursue shutting the public out. Locking the gates closed and obstructing appropriate access increases the risk of damage to the levees. Locking the gates open except when the river is closed by an appropriate agency (State Lands, for example) and under an appropriate process, presents no risk whatsoever to the flood control purposes of SBFCA.

I14-A In addition, this is a troubling development given the recently completed public comment period for the EIS/EIR. Did SBFCA know it was pursuing abandonment of Starr Bend Road while putting out a EIS/EIR indicating that there was no substantial effect contemplated on public access to public use lands and recreational resources? A proposal to eliminate an existing public road leading from the banks of the river across the levee and to Garden Highway (when there is already extremely limited access) sounds like something that should have figured into the cumulative effects analysis of the effect of this project on public access to public use lands and access to a recreational resource.

I suggest that SBFCA make sure that its final documents honestly reflect the foreseeable affect of this project, considered cumulatively with the construction of the levees and the intention of SBFCA and DWR to pursue further curtailment of public river access, on public access to public use lands and to the recreational resource that is the Feather River including the temporarily dry lands below high water mark.

You told me this was intended to be recreation neutral - I understood this to mean that SBFCA would not be pursuing matters that served no purpose other than to limit recreational access to the river. Instead SBFCA is actively pursuing further restrictions on public access to the river.

As public agencies, SBFCA and DWR are obligated to respect the public trust doctrine, and not interfere unnecessarily with the public use of the river and its banks.

Frank Coats

Response to Letter I14

I14-A

To clarify, LD 1 is pursuing abandonment of the road by Sutter County within the floodplain restoration area associated with LD 1's completed levee setback project. This is not a SBFCA action nor part of the FRWLP. The result of this action is that Sutter County would no longer be responsible for operations and maintenance of the former roadway; however, the underlying land still remains in public ownership and public access provisions for recreation may be possible. The FRWLP proposes no permanent change in public access and any access effects would be only temporary and associated with limiting access within the construction footprint and during the construction season for public safety. As such, there are no permanent effects on access to be described as part of the project or to be cumulatively considered. On the point of SBFCA's overall approach toward recreation and public access of the river corridor, SBFCA is honoring its commitment and will investigate opportunities to facilitate access. This commitment is demonstrated in the SBFCA Board's resolution on March 13, 2013 to adopt a memorandum of understanding (MOU) that specifically indicates that public access provisions will be considered in the Feather River Regional Flood Management Plan recently initiated with SBFCA as a co-lead for its development. Comment did not necessitate change to the Final EIS.

Letter I15—Francis Coats, March 14, 2013

Letter I15

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Thursday, March 14, 2013 8:01 AM
To: michael.bessette@sutterbutteflood.org; michael.inamine@sutterbutteflood.org; Jeff Koschak, Contact For Usace Frelp; Mary.Hays@slc.ca.gov; Curtis Fossum; Jan Stevens; Elliott, Chris
Subject: Feather River Access

Friends:

Please make sure that the minutes of the Wednesday SBFCA meeting accurately reflect Barbara LeVake's statement that LD1 does not support public access to the public land along the Feather River.

At the Sutter Butter Flood Control Agency meeting on Wednesday Barbara LeVake, LD1 board member and SBFCA board member, said that Levee District Number One of Sutter County does not support public access to public land on the Feather. We knew that from the number of locked gates mai twined by LD1 and the on going effort to have the county abandon Starr Bend Road, but it is nice to have a clear statement on the record from Barbara LeVake and LD 1 .

I15-A Also, the comment has implications for the pending EIS and its discussion of the cumulative effect of the FRWLP on public access to public lands an recreation areas. LD1 does not support access and as a board member and a maintenance organization, and can be foreseen to obstruct access in the future.

The DEIS is inadequate in its discussion of the FRWLP on access to publc use areas and recreational resources. Now we have a clear statement from a board member explaining why the issues were not discussed. It is clear that the cumulative effect of putting up gates along the LD1 portion of the FRWLP will certainly result in gates locked on a general basis by LD1, obstructing access to land the general public has a right to use for recreational purposes. The DEIS does not discuss this because the sponsoring agency is anti-public access.

Francis Coats 3392 Caminito Avenue Yuba City CA (530) 701-6116 fecoats@msn.com
Sent from my Kindle Fire

Response to Letter I15

I15-A

On March 14, 2013, Michael Bessette from the Sutter Butte Flood Control Agency e-mailed Mr. Coats a response confirming that the SBFCA Board meeting minutes will accurately reflect the statements made in the meeting by all who spoke at the meeting.

Mr. Bessette also noted that the outcome of the SBFCA Board's discussion at their meeting on March 13, 2013 was to pass a resolution to execute a memorandum of understanding (MOU) that includes facilitation of public access, specifically as studied through the Feather River Regional Flood Management Process, for which SBFCA is a co-lead. The FRWLP proposes no permanent change in public access and any access effects would be only temporary in nature associated with limitations of access within the construction footprint and during the construction season for public safety. As such, there are no permanent effects on access to be described as part of the project or to be cumulatively considered. The passage of the MOU, including a provision for public access, by an

eight-to-two favorable vote by the SBFCA Board as recommended by SBFCA staff demonstrates that SBFCA as the sponsoring agency for the FRWLP is not anti-public access. Comment did not necessitate change to the Final EIS.

Letter I16—Francis Coats, March 18, 2013

Letter I16

From: Francis Coats [mailto:fecoats@msn.com]
Sent: Monday, March 18, 2013 3:00 PM
To: Elliott, Chris; Michael Bessette; Mike Inamine; frwlp_comments@usace.army.mil
Subject: FRWLP inclusion of description of navigable servitude as part of the laws generally governing the process

Friends:

I have finally see a copy of the mou signed by the eleven or twelve environmental organizations/commentors.

I am still hoping the EIS will include, in the section setting out the laws effecting the project, a summary of the rights of the general public under the navigable servitude. Is that planned or at least being considered?

I16-A I also want to mention, in light of the attempt to draw a bright line between SBFCA and LD1, that SBFCA is a joint powers agency, formed for the purpose of facilitating each of its constituent agencies, including LD1's, accomplishment of its respective goals in its respective area. SBFCA does not empower LD1 to do anything, in a legal sense, that it was not empowered to do before. Nor does SBFCA have greater power in LD1's area, than LD1 had at the beginning. In a very real sense, LD1 is a sponsor of the EIS. Saying that what LD1 might do in the future in the way of obstructing public access to the river is some how not SBFCA's concern is not at all convincing, both because L1's future actions are a foreseeable future projects with a cumulative effect, and because LD1 is a sponsor of this EIS process.

Response to Letter I16

I16-A

The inclusion the commenter requested is included in the Final EIS in Section 3.14.2.1.

Letter I17—Bob Hackamack, December 26, 2012

Letter I17

-----Original Message-----
From: Bob Hackamack [mailto:BHackamack@frontier.com]
Sent: Wednesday, December 26, 2012 11:58 AM
To: FRWLP_Comments
Subject: RE: Feather River West Bank Levee Project EIS/EIR; the California Recreational Navigable Servitude

I17-A

Francis: The Corps is able and probably required to set the federal head of navigation. I wonder what they have set for Feather River?

You correctly quote some of Judge Montgomery's opinion as, " exercise the incidents of (navigation)", but it is my opinion that Judge Montgomery intended that public use "below high water mark", if I quote correctly, for those "incidents of navigation" include emptying a swamped boat and bypassing a river blockage, but not sitting on the shore to eat lunch or any other purpose like bird watching, fishing from shore or hiking. Boating and fishing from a boat was the subject of that suit brought by land owners. Do you have access to that decision? Other decisions and common law may have established the hiking, fishing, etc use of the land below annual high water mark for the past (20 ?) years.

In summary, I suspect the Corps wants to leave river access to the California courts and agencies rather than tackle it in the EIR/EIS, but you can require the Corps to state their head of navigation for the Feather in a letter to you or in the EIR/EIS, but on the Tuolumne the head set by the Corps at a ferry location that is well downstream of the present day actual and that set by the FERC. The FERC recognizes raft outfitter use as a commercial use and thus the head of navigation.

Good health and best wishes for the new year. Bob H

Response to Letter I17

I17-A

This comment was received via email and is addressed in response to another commenter (Francis Coats). To address the comment with regard to the navigability of the river, for the purposes of Section 10 of the Rivers and Harbors Act, the Feather River is considered navigable up to the Marysville Railroad Bridge (this information can be found at http://www.spk.usace.army.mil/Missions/Regulatory/Jurisdiction/NavigableWatersoftheUS.aspx). Beyond Section 10, it is well established that the Feather River is navigable in practice by small recreational craft throughout the study area (with Thermalito Afterbay as the northern project extent) and there are public boating facilities to support such use. Comment did not necessitate change to the Final EIS.

Letter I18—John M. Kuster, December 27, 2013

Letter I18

-----Original Message-----
From: Kuster, John M [mailto:jkuster@te.com]
Sent: Thursday, December 27, 2012 11:16 AM
To: FRWLP_Comments
Subject: Feather River west activities and available online information

I18-A I am a property owner along the levee for the Feather River, located north of the Hwy 99 crossing in approximately the area described by the letter recently received from the US Army Engineers. Since I live in the Bay Area, I was wondering how much information is available on the web about the project so as not to have travel to the meetings in either Yuba City or Gridley. My property

I18-B is just north of Laurel Ave. (37 Laurel is the actual address) and not too many years ago a rock "toe" was constructed along our property to help retain stability of the levee from sliding. Rocks were used to fill in a drain ditch along the outside of the levee. Also, we do have an irrigation water pipeline that is submersed within the levee that leads from our fields to a pump on a pond on the inside bank of the levee. We maintain riparian rights to this water. Is this pipeline in jeopardy?
I appreciate any information available.

Sincerely,

John Kuster

Sr. Product Manager - N. America & Asia
<rtfimage://>
Aerospace, Defense & Marine Division
Office; 650 361-5384
Cell; 650 384-9349
email: jkuster@te.com

Response to Letter I18

I18-A

Interested parties can visit the project website at www.sutterbutteflood.org/ for more information and updates about the FRWLP. It is updated regularly and if you have additional questions you can email info@sutterbutteflood.org. Materials presented at the scoping meetings in January 2013 are on the website. Comment did not necessitate change to the Final EIS.

I18-B

USACE and SBFCA appreciate your review and comment on the Draft EIS/EIR and understands your concerns about this very sensitive issue related to your home. Immediately north of Laurel Avenue, the 65% engineering design documents proposes construction of a seepage berm on the landside of the levee and a slurry cutoff wall through the levee. Details of how the existing rock “toe” and previously filled drain ditch along the outside of the levee will be affected will be developed as the engineering designs progress to the 100% completion stage. SBFCA will work with each landowner to determine next steps in terms of specific effects on their property. Comment did not necessitate change to the Final EIS.

Letter I19—Al Sawyer, January 16, 2013

Feather River West Levee Project
January 16, 2013 Public Meeting
Comment Card

US Army Corps of Engineers
Sacramento District

Letter I19

Date: 1/16/13

Name: Al Sawyer Title: Asst PWD

Phone: 530 822 7450 Fax: Affiliation: Sutter Co.

Email: asawyer@co.sutter.ca.us Street Address 1130 Civic Center Blvd

City: Yuba City State: CA Zip: 95993

☑ Please add me to the mailing list to receive future updates.

Thank you for attending the Feather River West Levee Project (FRWLP) public meeting. Please provide your input in the space below about the content of the draft environmental impact statement/environmental impact report (EIS/EIR) for the FRWLP. After you've written your comments in the space below, place this card in one of the designated baskets around the room or hand it to a project team member. The public can also comment on the draft EIS/R via email or US Postal Service until Feb. 13, 2013. The public may send comments via email to *FRWLP_comments@usace.army.mil* or to USACE, Sacramento District, ATTN: Mr. Jeff Koschak (CESPK_PD_RP),1325 J Street, Sacramento, CA 95814.
Please write legibly.

Construction-related impacts to county roads. Sutter County requires a permit and mitigation for haul (intensive) truck damage to roadways.

I19-A

A specific special provision in the contract documents to ensure permits are recognized and obtained is suggested.

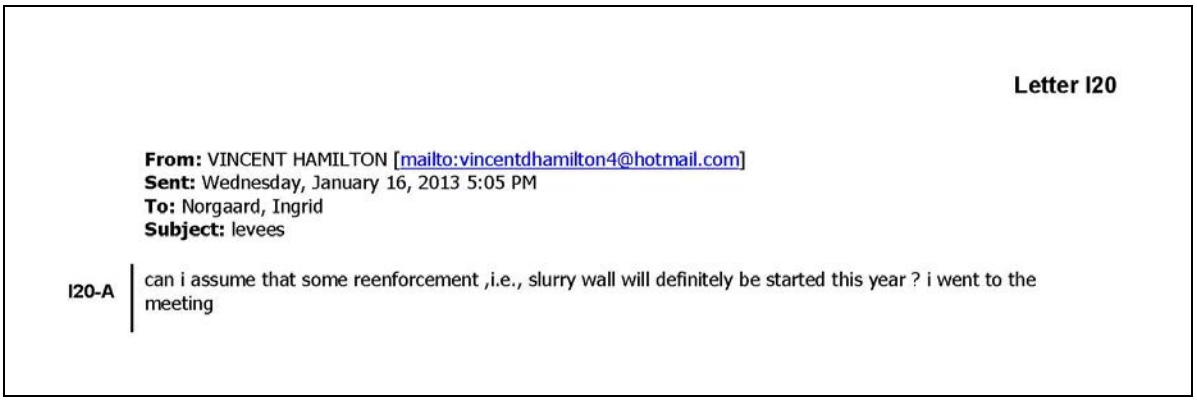
Borrow pits need to be addressed early as well for SMARA and/or County grading permit compliance.

Response to Letter I19

I19-A

Comment noted. SBFCA will obtain a permit from Sutter County for their hauling activities. Comment did not necessitate change to the Final EIS.

Letter I20—Vincent Hamilton, January 16, 2013



Letter I20

From: VINCENT HAMILTON [mailto:vincentdhamilton4@hotmail.com]
Sent: Wednesday, January 16, 2013 5:05 PM
To: Norgaard, Ingrid
Subject: levees

I20-A | can i assume that some reenforcement ,i.e., slurry wall will definitely be started this year ? i went to the meeting

Response to Letter I20

I20-A

SBFCA is working hard to begin construction this year, most likely in a reach on the south end of Yuba City that has been the site of prior levee failures. Similarly, USACE and other cooperating agencies are working expeditiously toward approvals necessary to facilitate construction. Other reaches are expected be constructed in 2014 and may continue through 2015. The commenter's attendance and participation are appreciated. Comment did not necessitate change to the Final EIS.

Letter I21—Vincent Hamilton, January 16, 2013

Feather River West Levee Project
January 16, 2013 Public Meeting
Comment Card

US Army Corps of Engineers
Sacramento District

Letter I21

Date: 1-16-13

Name: Vincent Hamilton Title: MD

Phone: 6748031 Fax: 6740602 Affiliation:

Email: vincentdhamilton4@hotmail.com Street Address 870 Shasta St. #4

City: Yuba City State: Cal. Zip: 95991

☒ Please add me to the mailing list to receive future updates.

Thank you for attending the Feather River West Levee Project (FRWLP) public meeting. Please provide your input in the space below about the content of the draft environmental impact statement/environmental impact report (EIS/EIR) for the FRWLP. After you've written your comments in the space below, place this card in one of the designated baskets around the room or hand it to a project team member. The public can also comment on the draft EIS/R via email or US Postal Service until Feb. 13, 2013. The public may send comments via email to *FRWLP_comments@usace.army.mil* or to USACE, Sacramento District, ATTN: Mr. Jeff Koschak (CESPK_PD_RP),1325 J Street, Sacramento, CA 95814.
Please write legibly.

I favor the whole slurry wall plan. If it protects levees to keep people off them in rainy season, so be it.

I also favor keeping Englebright Dam intact

I21-A

Human + housing protection is the most important goal.

Wouldn't river bed dredging be helpful?

Response to Letter I21

I21-A

SBFCA's preferred alternative, for which permits are being sought, is the plan that is predominantly slurry walls (more than 85%). There are some locations where a seepage berm is the more effective solution, so they are used instead of slurry walls in these areas. River dredging does not substantially reduce flood risk because the Feather River in the study area is not limited in conveyance capacity and because dredging would not address the documented deficiencies according to Federal and state criteria. Comment did not necessitate change to the Final EIS.

Letter I22—Michael C. Andrews, January 17, 2013

Letter I22

Feather River West Levee Project
January 16, 2013 Public Meeting
Comment Card

US Army Corps of Engineers
Sacramento District

Date: 01/17/2013

Name: Michael C. Andrews DPM Title: Citizen

Phone: 530-218-2648 Fax: ——— Affiliation: Sutter Co Resident

Email: ——— Street Address 888 Southland Drive

City: Yuba City State: Calif Zip: 95991-6939

☐ Please add me to the mailing list to receive future updates.

Thank you for attending the Feather River West Levee Project (FRWLP) public meeting. Please provide your input in the space below about the content of the draft environmental impact statement/environmental impact report (EIS/EIR) for the FRWLP. After you've written your comments in the space below, place this card in one of the designated baskets around the room or hand it to a project team member. The public can also comment on the draft EIS/R via email or US Postal Service until Feb. 13, 2013. The public may send comments via email to *FRWLP_comments@usace.army.mil* or to USACE, Sacramento District, ATTN: Mr. Jeff Koschak (CESPK_PD_RP),1325 J Street, Sacramento, CA 95814.

Please write legibly. Attended 01/16/2013 and toured at informative Cut Throat and Hike Control-ler Seal - It all family appears very beautiful with all the multi-billion dollars of government to Hard Can that be efficient? - The voters approved that 30 year the State put in the vest - right? It seems

I22-A the answer to the levee is the Slurry Wall to prevent seepage/leakage - and make the Levee Stable - right? - That just do the job - !!! - But there so many Studies and Realignments and environment Studies that just cost more money - Sure there are Lots of jobs for all these beautiful Levees but that is taxpayers dollars - Just do the damn Slurry Wall and stop "Shadowing around" MCA

Response to Letter I22

I22-A

The commenter's frustration with the complex processes to get to construction is understood. SBFCA, USACE, and the State of California have worked toward and achieved streamlining of these processes to facilitate construction scheduled for 2013, continuing in 2014 and 2015. SBFCA's preferred alternative, for which permits are being sought, is the plan that is predominantly slurry walls (more than 85%). There are some locations where a seepage berm is the more effective solution, so they are used instead of slurry walls in these areas. The commenter's support in moving forward to achieve flood-risk reduction as quickly as possible is appreciated. Comment did not necessitate change to the Final EIS.

Letter I23—Sharron Cosker, January 19, 2013

Letter I23

-----Original Message-----
From: SHARRON COSKER [mailto:scosker@sbcglobal.net]
Sent: Saturday, January 19, 2013 7:17 PM
To: Koschak, Jeff A SPK
Cc: ingrid.norgaard@icfi.com
Subject: Feather River West Levee Project

Hi Jeff,

I23-A | I am a home owner at 423 2nd Street in Yuba City, Ca. 95991.. I was not able to attend the meeting held on January 15 & 16 but I have heard a lot of negative comments from home owners.

I am very interested in some details of the meeting. Are there minutes? Is this a proposal only or already slated to start in 2013? When will be know how our situation is going to be affected?

I23-B | My home back up to the Levee at this time and would have to be removed to make the project happen. Is there a plan to aquire the home by purchasing? If so what would be the value basis? Would the Historical homes be moved to another location? The family lives in three of these historical homes along that portion of the levee so naturally we are all interested in our future.

I23-A cont'd | Is there a web site where the project information can be viewed?

Thank you and I would appreciate hearing from you soon,

Sharron Cosker
423 2nd Street
916-276-3126

Response to Letter I23

I23-A

A meeting was held on February 26, 2013 with the 2nd Street property owners to provide them with more information about how their properties might be affected by the project. Interested parties can also visit the project website at www.sutterbutteflood.org/ for more information and updates about the FRWLP. It is updated regularly and if you have additional questions you can email info@sutterbutteflood.org. Materials presented at the scoping meetings in January 2013 are on the website. Comment did not necessitate change to the Final EIS.

I23-B

USACE and SBFCA appreciate your review and comment on the Draft EIS/EIR and understands your concerns about this very sensitive issue related to your home. As SBFCA prepares to construct each phase of the project, they and their engineers will evaluate the homes in the footprint to determine if they threaten the integrity of the levee or project. If the answer is "yes," SBFCA will work with each landowner to determine next steps in terms of the acquisition process (including issues related to home value, relocation, etc.). SBFCA is still evaluating whether structures directly adjacent to the levee along 2nd Street will ultimately have to be removed. If they are acquired, values will be based on appraisals. Comment did not necessitate change to the Final EIS.

Letter I24—Sharron Cosker, January 25, 2013

Letter I24

-----Original Message-----
From: SHARRON COSKER [mailto:scosker@sbcglobal.net]
Sent: Friday, January 25, 2013 6:51 PM
To: Jeff A SPKKoschak
Cc: Norgaard, Ingrid; FRWLP_Comments
Subject: RE: Feather River West Levee Project

I24-A | Thank you all for returning my email. I understand that a meeting for the 2nd street homeowners is tenatively planned for Feb. 19th. I will wait until then to get answers to all of my questions.
Thank you,

Sharron Cosker
423 2nd Street
Yuba City, Ca. 95991

Response to Letter I24

I24-A

USACE and SBFCA appreciate the commenter's participation in the process. Comment did not necessitate change to the Final EIS. A meeting with the homeowners occurred on February 26, 2013.

Letter I25—Carl Cilker, January 28, 2013

Letter I25

-----Original Message-----
From: CCilker [mailto:ccilker@gmail.com]
Sent: Monday, January 28, 2013 11:58 AM
To: FRWLP_Comments
Subject: Cutoff wall tip XX feet

I25-A Can you explain this term and give me an illustration of what it represents? I see it repeatedly in the EIR/EIS with no illustration or clear explanation of what is intended by it.

Thank you,
Carl Cilker

Carl Cilker
ccilker@gmail.com

Sr. VP
Cilker Orchards
1631 Willow St. #105
San Jose, CA 95125
P: 408 264-2534 x201
F: 408 264-2537 fax
C: 408 499-7195

Response to Letter I25

I25-A

Plate 2-4 provides an illustration of a slurry cutoff wall and a narrative description is provided in Section 2.5.1. The tip elevation, expressed in feet, refers to the bottom elevation of the cutoff wall, meaning the elevation at which excavation for the wall would stop. It is not the same as depth; to calculate wall depth, the tip elevation would need to be subtracted from the levee de-grade elevation. Comment did not necessitate change to the Final EIS.

Letter I26—Jeff Fredericks, February 12, 2013

Letter I26

February 12, 2013

Feather River West Levee Project, EIR Comments

USACE, Sacramento District
ATTEN: Mr. Jeff Koschak
1325 J Street
Sacramento, Ca 95814

Mr. Koschak,

My name is Jeff Fredericks, I live at 902 Vance Ave, Biggs, Ca (section/area #37, station 2275 to 2290 of the EIR) and I would like to provide the following comments to the EIR Draft and general comments to the project as a whole.

Attending various meetings and in the EIR, I have seen and heard many times that two of the major goals are; To do the project as cost effective as possible and comply with The Farm Land Protection Act. Because of this I would like to propose the following in this section of the levee:

I26-A

Option 1
Construct the slurry cut off wall at the levee closest to the river in the existing levee from Vance Ave to at least Palm Ave. There is an existing levee now at this location. This would save money to the project as you would not have to buy farm ground from individuals as the state already owns this ground and it would also save valuable farm ground from extinction. It would also be the least impact to the property owners in this area due to construction activities, relocations of existing utilities, removal of structures, possible irrigation and domestic well relocations, abandonments or deterioration and most notably livelihood.

I26-B

Option 2
I own property on both side of the levee, so I have to travel back and forth across the levee to access my property. If you relocated the levee to the east (closer to the river) this would allow me to access all of my property. This would also allow for more area between existing structures and the relocated levee. This option might create new farmable ground thereby offsetting some of the prime farm ground you are eliminating.

I26-C

Option 3
Do not rebuild the levee to its existing elevation. Per your report and from what I have read, the levee is already at least 5 ft higher than what is required for a 200 yr flood. This would save money in construction cost, improving the scenic landscape and be socially acceptable.

I26-D

Option 4
Fill in the areas on the east side of the levee that was used for the borrow areas to build the levee. I would like to offer my property on the east side of the levee as a spoils area for clean fill (native sandy loam) material. Native clean fill may be brought up to the elevation of the original ground before the levee was installed. This would save construction costs as native clean spoils would not have to be hauled off site. It would also save costs in having to purchase more property as the new toe of the levee would be located up on the levee within the existing right of way. By raising the grade on the east side

I26-D cont'd of the levee this would help in preventing underground boils. This option might create new farmable ground thereby offsetting some of the prime farm ground you are eliminating.

In addition to the options above I would like to comment on the following;

I26-E
- During Construction;
  - How are unforeseen existing utilities and improvements going to be accounted for?
  - How is dust going to be kept to a minimum?
  - How do you plan on keeping rattle snakes from migrating into buildings and structures?
  - Per your report, "it's not typical for construction equipment to be within 30 ft of a structure". I have one structure that is already within the levee foot print, what happens in this case?
  - How is underground water turbidity going to be handled? I have two wells within 100ft of the levee and believe that silts will be stirred up during construction as the slurry cutoff wall will be 90ft deep at my location.

I26-F
- After the work is complete;
  - Who is going to have access to the levee?
  - Who is going to inspect and maintain the levee?
  - How is access going to be granted for property owners that have to access both side of the levee?
  - How is the repair of failed / broken underground utilities going to be handled? Will property owners have the right to repairs pipes during the irrigation season to save their crops?
  - What is the plan if an existing well stops producing or produces less than what it did before construction? Per all your models well production is not an issue, but what happens if your models are wrong?
  - There is mention of exclusion fencing or K-rail. Are these items to be used during construction activities only or is there a plan for permanent fencing once the project is complete? If there is a plan for permanent fencing, what is the plan?

I26-G In the EIR you comment, that orchards have limited value to wildlife. This statement is very offensive to me and can't see how you can make such a claim. Orchards see an abundance of wildlife and provide homes for such. Orchards are very valuable to wildlife not to mention our environment. In Light of the fact that I'm being forced to sell a portion of my property and the opinion is that orchards are not important, I do not have a warm fuzzy feeling about this whole proposition and project. I just hope that property owners along the levee will be treated fairly. How will fair market value be assessed? Will my property assessment include the loss of future income that will come from the sale of my livelihood?

I26-H Finally, other than access for inspections, I don't understand why I would not be able to replant my orchard within the proposed levee right of way? From what I understand, the planting of an orchard does not create unstable ground if anything it creates stability. If you want to inspect the levee today in this area you could with the orchard existing. I propose to the state that replanting be permitted or existing orchards be left as they are now.

Jeff Fredericks
902 Vance Ave
Biggs, Ca 95917

Response to Letter I26

I26-A

USACE and SBFCA appreciate your review and comment on the Draft EIS/EIR. SBFCA went through an extensive alternatives review during several phases of the project development: a pre-program screen prior to the EIR/EIS analysis; a program-level screen that considers planning, engineering and financial factors; and a project-level screen specific to the project reach and focused on determining the most appropriate project proposal based on local context and deficiencies. The alternatives presented in the EIS/EIR best address the primary levee and flood management deficiencies in each stretch of the FRWLP study area. From a NEPA perspective, USACE worked cooperatively with SBFCA in determining the purpose and need for the project and adequacy of alternatives to meet the purpose. From an engineering perspective, USACE provided technical review of the project under its responsibilities in carrying out Section 408 permission. The "levee" closest to the river is not the Federal project levee and is not proposed for remediation with this project. Comment did not necessitate change to the Final EIS.

I26-B

The project is proposed as a 'fix-in-place' remediation and does not propose to relocate the existing federal project levee. Fix-in-place has been found to be the most cost efficient remediation method for the FRWLP. Comment did not necessitate change to the Final EIS.

I26-C

In some locations the existing levee height provides freeboard in excess of minimum requirements. Excess freeboard reduces the risk of levee overtopping during rare flood events therefore the Project will reestablish the existing levee height and existing available freeboard. Comment did not necessitate change to the Final EIS.

I26-D

As the final project designs are completed, SBFCA will evaluate the area identified as a potential spoil location, should one be needed in that area. Comment did not necessitate change to the Final EIS.

I26-E

During Construction

a. *How are unforeseen existing utilities and improvements going to be accounted for?*

   How unforeseen utilities and improvements are handled will depend upon their nature. Critical utilities will be perpetuated while abandoned or unused utilities may be removed after consultation with the utility owner.

b. *How is dust going to be kept to a minimum?*

   Contractor will be required to implement dust control measures such as applying water to the work area.

c. *How does SBFCA plan on keeping rattle snakes from migrating into buildings and structures?*

SBFCA is not including any specific measures to address the potential for rattlesnakes to enter buildings outside of the construction area, but if there is concern over this potential occurrence, SBFCA recommends the commenter seal all cracks and other openings greater than 1/4 inch to prevent rattlesnakes from entering his buildings/structures. The commenter may also want to block off the gap beneath his garage door and ensure that there are no gaps or openings to the crawl space under the building. These measures should greatly reduce the potential for displaced rattlesnakes to enter buildings.

d. *Per the EIS/EIR, "it's not typical for construction equipment to be within 30 feet of a structure." Commenter has one structure that is already within the levee footprint, what happens in this case?*

Structures in the vicinity of the levee that will remain in place after completion of the project will be identified accordingly in the construction drawings and will be protected in place during construction activities.

e. *How is underground water turbidity going to be handled? Commenter has two wells within 100 feet of the levee and believes that silts will be stirred up during construction as the slurry cutoff wall will be 90 feet deep at their location.*

SBFCA will conduct pre- and post-construction well tests on wells in the vicinity of the slurry wall construction to determine if the slurry wall construction creates water quality or water quantity effects.

I26-F

After the Work is Complete

f. *Who is going to have access to the levee?*

The project is not proposing to alter who has access to the levee. The levee will continue to be accessed by Federal, state and local agencies with responsibilities for levee inspections, maintenance and operations. Others with existing rights to access the levee may also continue to exercise their access rights after completion of the project.

g. *Who is going to inspect and maintain the levee?*

Federal, state and local agencies will continue to inspect the levee. The State of California currently is responsible for maintenance of the levee adjacent to your property and will continue to maintain that segment of the levee after completion of the project.

h. *How is access going to be granted for property owners that have to access both sides of the levee?*

Access easements will be granted to property owners who have to access both sides of the levee.

i. *How is the repair of failed/broken underground utilities going to be handled? Will property owners have the right to repair pipes during the irrigation season to save their crops?*

SBFCA will coordinate with property owners and utility owners to ensure that any damaged underground utilities are repaired in a timely manner to avoid service disruptions during critical times. SBFCA will coordinate with property owners to schedule utility relocations and temporary service disruptions with irrigation schedules.

j. *What is the plan if an existing well stops producing or produces less than what it did before construction? Per all models for the FRWLP well production is not an issue, but what happens if the models are wrong?*

SBFCA will conduct pre- and post-construction well tests on wells in the vicinity of the slurry wall construction to determine if the slurry wall construction creates water quality or water quantity effects.

k. *There is mention of exclusion fencing or K-rail. Are these items to be used during construction activities only or is there a plan for permanent fencing once the project is complete? If there is a plan for permanent fencing, what is the plan?*

Exclusion fencing or K-rail will be used during construction activities only. SBFCA is not planning to install new permanent fencing throughout the project. However, operating and maintaining agencies may elect to install permanent fencing in the future. Currently no plan exists for new permanent fencing throughout the project.

I26-G

There are several components to this comment. First, let it be expressed that orchards are viewed as highly important to SBFCA and its member agencies. A major driver for the project is protection of agricultural commodities and infrastructure to ensure that the region remains strong and viable for sustainable agriculture as the dominant economic engine, and orchards are a highly valued target crop. In regard to the value of orchards for wildlife, it is acknowledged that agriculture, and orchards in particular, provide forage, nesting, and roosting habitat for many species. However, from an ecological perspective, orchards do not provide the multi-layered structure, diversity of vegetation for food and cover, and other functions compared to native riparian habitat associated with river corridors. Also, orchards are subject to spraying, mowing, pruning, harvesting, and other management activities that disturb wildlife. It is for these reasons that orchards are considered to have limited value to wildlife relative to native habitat. With regard to property value determinations, the agency will hire an independent, accredited appraiser familiar with local property values to appraise the property and determine its fair market value. The appraiser will contact the property owner to make an appointment to inspect the property, and invite the property owner to accompany him/her during an inspection of the property. The property owner should give the appraiser any information about improvements and any special features that he/she believes may affect the value of the property, such as:

- There are other persons who have ownership or interest in the property.
- There are tenants on the property.
- Items of real or personal property that belong to someone else are located on your property.
- The presence of hazardous material, underground storage or utilities.
- There are contracts for the crops grown on the property

The appraiser will inspect the property and note its physical characteristics. He/she will review sales of similar properties in order to compare the facts of those sales with the facts about the property. The appraiser will analyze all elements that affect value. The appraiser must consider normal depreciation and physical deterioration that has taken place.

After the inspection, the appraiser will complete an appraisal report that will include the appraiser's determination of the property's fair market value and the information upon which the fair market value is based. It is important to note that each parcel of real property is different and, therefore, no single formula can be used to appraise all properties. Among the factors an appraiser typically considers in estimating fair market value are the following.

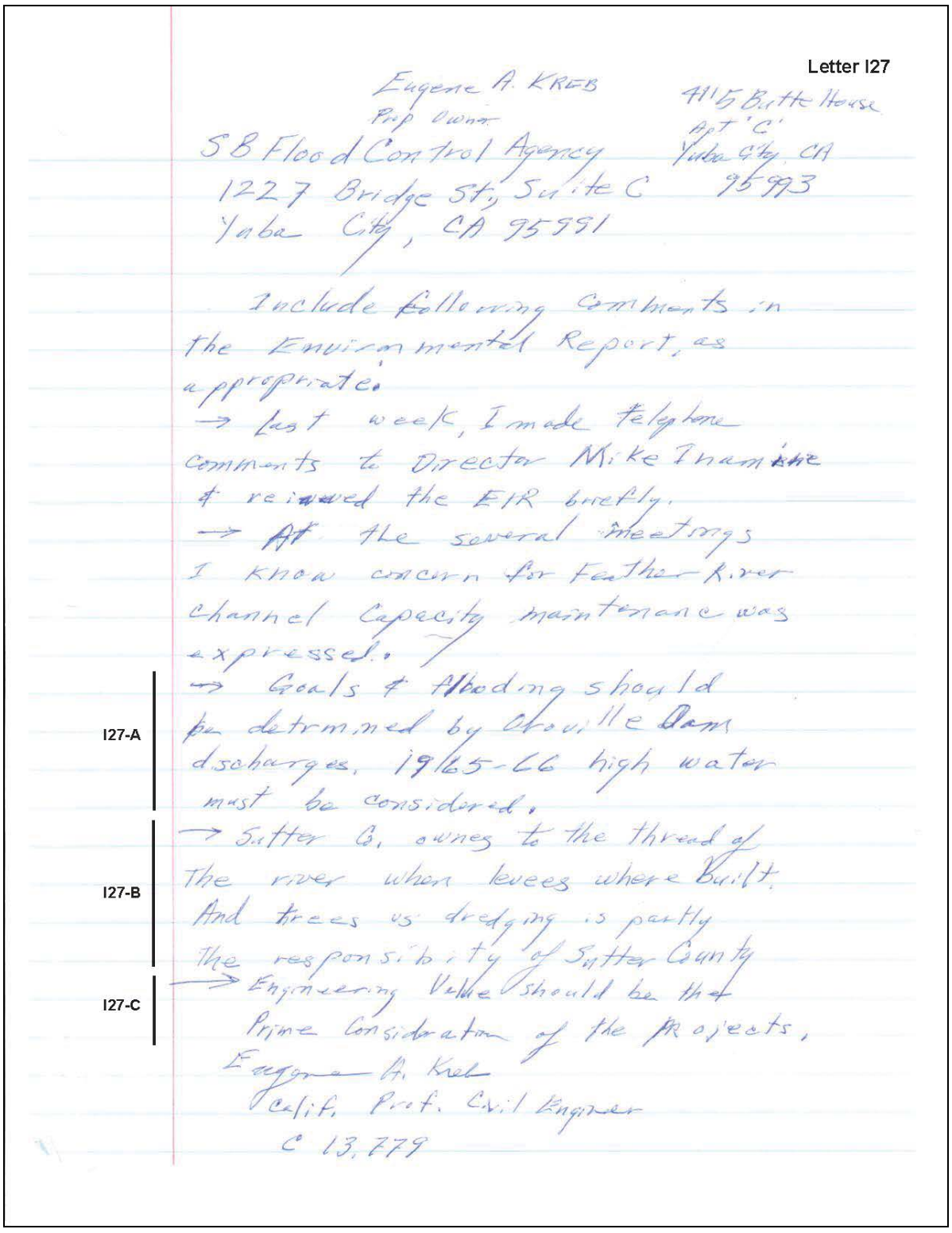
- The location of the property.
- The age and condition of improvements on the property.
- How the property has been used.
- Whether there are any lease agreements relating to the property.
- Whether there are any environmental issues, such as contaminated soil.
- Applicable current and potential future zoning and land use requirements.
- How the property compares with similar properties in the area that have been sold recently.
- How much it would cost to reproduce the buildings and other structures, less any depreciation.
- How much rental income the property produces, or could produce if put to its highest and best use.

The appraisal report will describe the property and the agency will determine a value based on the condition of the property on the day that the appraiser last inspected it, as compared with other similar properties that have sold. The value in the appraisal report will include the value of any orchards on the property being acquired, and therefore will take into account the future income that the orchards may produce. Comment did not necessitate change to the Final EIS.

I26-H

The levee right of way is required for constructing and maintaining the levee. Replanting of trees within the right of way is not permissible due to the potential interference with levee maintenance activities. Comment did not necessitate change to the Final EIS.

Letter I27—Eugene A. Kreb, February 13, 2013



Letter I27

Eugene A. KREB
Prop Owner
SB Flood Control Agency
1227 Bridge St, Suite C
Yuba City, CA 95991

4115 Butte House
Apt 'C'
Yuba City, CA
95993

Include following comments in the Environmental Report, as appropriate.

→ Last week, I made telephone comments to Director Mike Inamine & reviewed the EIR briefly.

→ At the several meetings I know concern for Feather River channel capacity maintenance was expressed.

I27-A → Goals & Alloding should be determined by Oroville Dam discharges. 1965-66 high water must be considered.

I27-B → Sutter Co. owns to the thread of the river when levees where built. And trees vs dredging is partly the responsibility of Sutter County

I27-C → Engineering Value should be the Prime Consideration of the Projects,

Eugene A. Kreb
Calif. Prof. Civil Engineer
C 13,779

Response to Letter I27

I27-A

A range of hydrologic factors has been considered in project planning, including varying discharges from Oroville and historical events of high velocity and water surface elevation. Comment did not necessitate change to the Final EIS.

I27-B

It is understood that the comment is partly about tree management. This responsibility has been primarily assumed by LD 1 and LD 9 and California Department of Water Resources (DWR) based on the section of levee in the jurisdiction of each of these entities. Dredging is not considered an effective option for reducing flood risk because it would not address the known geotechnical deficiencies associated with the levees that have contributed to several catastrophic floods over the past 100 years. Comment did not necessitate change to the Final EIS.

I27-C

It is agreed that value is important and SBFCA has continually and aggressively implemented cost controls. The project is being delivered within budget and represents a wise investment of the assessment. One measure of cost control has been the use of independent third-party engineering review to ensure best value. Additional details on the value-engineering process are available upon request. Beyond design and transitioning to construction, the project will be subject to competitive bid and selection of the lowest qualified bidder. Comment did not necessitate change to the Final EIS.

Letter I28—Rick Walkling, February 15, 2013

Letter I28

2447 Derby Street
Berkeley, CA 94705

February 15, 2013

Mike Inaminie
Executive Director
Sutter Buttes Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

Dear Mr. Inaminie:

Thank you for the opportunity to provide comments on the draft environmental impact report and study (DEIR/DEIS) for the Sutter Butte Flood Control Agency's West Levee Project that will be largely funded by state, and potentially federal, taxpayers. I worked on the Oroville FERC Relicensing and am a frequent recreational boater on the Feather River.

I28-A I am concerned that the DEIR/DEIS does not consider a reasonable range of alternatives, and more importantly, that the proposed project could increase long-term flood risk both for the communities in the project area and urban communities downstream along the Sacramento River. Together with other organizations, we are particularly disappointed that the DEIR does not address any of the recommendations that American Rivers made in scoping comments to the DEIR.

I28-B The DEIR/DEIS did not adequately evaluate a range of alternatives, consider the growth inducing impacts of the project, the potential for the project to increase flood risk (as opposed to decreasing it), or consider the robustness of various alternatives to a changing climate. We look forward to working with you in the Feather River Regional Flood Planning program in the months ahead to better understand your agency's perspective on these issues and hopefully develop a common vision for a path forward.

I28-C We fully support development of a flood protection project to protect communities in the project area. We would support a different alternative than those analyzed in the DEIR and believe that such an alternative could better reduce long-term liabilities for the state and federal government, reduce long-term flood risk for communities in the project area, improve long-term water supply reliability for the State Water Project, improve water quality, and enhance fish and wildlife habitat. We would support a hybrid alternative that would involve fixing levees in place adjacent to urban areas, setting-back some reaches of the levee to attenuate flood flows, constructing low ring levees and drainage channels to route flood waters away from urban areas to the western and southern portions of the study area, and elevating structures in rural areas that would still be vulnerable to shallow flooding under this hybrid approach. We

I28-D do not support construction of any portions or phases of the proposed project described in section 2.2.3 of the DEIR/DEIS. We would, however, support a "no-regrets" phase of the project

I28-D cont'd that is necessary to improve flood protection for Yuba City without foreclosing long-term sustainable flood management.

I28-E Many of the problems with the project and DEIR/DEIS could be avoided or mitigated through a more comprehensive flood risk management approach designed to advance a more sustainable flood management system. Growth inducing impacts and associated increases in flood risk could be avoided through a combination of land use restrictions, agricultural conservation easements, building codes, and a robust emergency response program. Flood risk threats to downstream communities, project performance under climate change, and the lack of a multiple benefit approach could be resolved by a modified project design that utilizes a full toolbox of flood management strategies rather than a levee focused approach.

I28-F We would like to work constructively with SBFCA and the USACE to expedite sustainable flood protection for the project area consistent with the Central Valley Flood Protection Plan, Executive Order 11988, and other applicable state and federal laws, plans, and policies. We believe that by working together we can develop a common vision that will better serve the taxpayers, and as a result, increase their willingness to invest in better flood management for the Central Valley.

Sincerely,

Rich Walkling

Response to Letter I28

I28-A

Between the publication of the Draft EIS/EIR and the final version of these documents, SBFCA worked intensively with representatives of the environmental community led by American Rivers to come to a better understanding of the flood-risk characteristics of the study area and downstream and the feasibility and efficacy of alternatives available to reduce flood risk. Through those conversations and documented in the supplemental comment letter signed by the coalition of environmental organizations, it has been acknowledged that the range of alternatives is considered adequate. The SBFCA Board and the coalition of environmental organizations have agreed to a memorandum of understanding (MOU) that commits to pursuing several identified multi-benefit actions including ecosystem restoration for fish and wildlife habitat, and the habitat that will be created as a direct result of the FRWLP at the Star Bend site, as well as others that may be identified through the Feather River Regional Flood Management Plan. Constructing the FRWLP is essential as the foundation upon which restoration building blocks can be laid. Comment did not necessitate change to the Final EIS.

I28-B

As described in the response to comment I28-A, between the publication of the Draft EIS/EIR and the final version of these documents, SBFCA worked intensively with representatives of the environmental community led by American Rivers to come to a better understanding of the flood-

risk characteristics of the study area and downstream, growth plans for the area, the feasibility and efficacy of alternatives available to reduce flood risk, and accommodation within the alternatives for changing climate and hydrology. Through those conversations and documented in the supplemental comment letter signed by the coalition of environmental organizations, it has been acknowledged that the range of alternatives is considered adequate. As codified in the MOU approved by SBFCA's Board on March 13, 2013, SBFCA similarly looks forward to working with the commenter and representatives from other organizations toward future multi-benefit actions through the Feather River Regional Flood Management Plan. Comment did not necessitate change to the Final EIS.

I28-C

The measures suggested in the comment were indeed evaluated by SBFCA for the FRWLP and by USACE and the State of California through the Sutter Basin Feasibility Study. While such measures may contribute to flood-risk reduction, they would not address the documented deficiencies in the levee that have resulted in catastrophic failures in the study area repeatedly in the last 100 years. Because much of the levees in the study area are already in a setback condition and provide floodplain area to allow the river platform to migrate and provide opportunity for enhanced fish and wildlife habitat, the alternative to fix the levees in place is considered a "no regrets" plan to allow future restoration actions in the floodplain to realize those opportunities. It is for this reason—to allow for a potential levee setback in the future near the confluence of the Feather River with the Sutter Bypass—that the project stops 4 miles north of the confluence. As discussed in the responses to comments I28-A and I28-B, between the publication of the Draft EIS/EIR and the final version of these documents, SBFCA worked intensively with representatives of the environmental community led by American Rivers to come to a better understanding of the flood-risk characteristics of the study area and downstream, growth plans for the area, the feasibility and efficacy of alternatives available to reduce flood risk, and accommodation within the alternatives for changing climate and hydrology. Through those conversations and documented in the supplemental comment letter signed by the coalition of environmental organizations, it has been acknowledged that the range of alternatives is considered adequate. Comment did not necessitate change to the Final EIS.

I28-D

As discussed in the responses to comments I28-A through C, between the publication of the Draft EIS/EIR and the final version of these documents, SBFCA worked intensively with representatives of the environmental community led by American Rivers to come to a better understanding of the flood-risk characteristics of the study area and downstream, growth plans for the area, the feasibility and efficacy of alternatives available to reduce flood risk, and accommodation within the alternatives for changing climate and hydrology. Through those conversations and documented in the supplemental comment letter signed by the coalition of environmental organizations, it has been acknowledged that the range of alternatives is considered adequate. Because much of the levees in the study area are already in a setback condition and provide floodplain area to allow the river platform to migrate and provide opportunity for enhanced fish and wildlife habitat, the alternative to fix the levees in place is considered a "no regrets" plan to allow future restoration actions in the floodplain to realize those opportunities. It is for this reason—to allow for a potential levee setback in the future near the confluence of the Feather River with the Sutter Bypass—that the project stops 4 miles north of the confluence. It has been further demonstrated to American Rivers that the project as proposed is essential for risk reduction for Yuba City, Gridley, Live Oak, and other communities north of Yuba City and is considered "no regrets" from the standpoint of protecting

existing populations in the study area while allowing for substantial future multi-benefit actions. Comment did not necessitate change to the Final EIS.

I28-E

It is agreed that the measures described are all part of a comprehensive and more holistic flood-risk management approach. SBFCA and its member agencies with land-use authority are in fact pursuing such measures. However, the project as proposed is considered an essential element in combination with these other measures to address documented deficiencies that have contributed to several catastrophic floods in the past 100 years and to meet Federal and state criteria. Comment did not necessitate change to the Final EIS.

I28-F

SBFCA and USACE appreciate the commenter's interest, and SBFCA specifically looks forward to working with the commenter through the Feather River Regional Flood Management Plan. Comment did not necessitate change to the Final EIS.

Letter I29—Edward C. Beedy, PhD

Letter I29

February 15, 2013

Mr. Mike Inaminie
Executive Director
Sutter Buttes Flood Control Agency
1227 Bridge Street, Suite C
Yuba City, CA 95991

RE: Comments on the SBFCA DEIR/DEIS West Levee Project

Dear Mr. Inaminie:

Thank you for the opportunity to provide comments on the draft environmental impact report and study (DEIR/DEIS) for the Sutter Butte Flood Control Agency's West Levee Project that will be largely funded by state, and potentially federal, taxpayers. I recognize the paramount importance of protecting communities from catastrophic flooding and am very interested in working with your agency to obtain the taxpayer funding necessary for advancing multiple-benefit projects that will protect communities in your service area, improve recreational opportunities for Central Valley residents, and enhance fish and wildlife habitat along the lower Feather River. However,

I29-A

I am concerned that the DEIR/DEIS does not consider a reasonable range of alternatives, and more importantly, that the proposed project could increase long-term flood risk both for the communities in the project area and urban communities downstream along the Sacramento River, while not improving the habitat for fish and wildlife.

I29-B

For more than 20 years a group of friends and I have floated the Feather River from Oroville to Marysville on canoes and rafts for recreation and to enjoy the native vegetation and wildlife, as well as to observe the impressive migrations of fall-run Chinook salmon. As a professional wildlife biologist, I can attest that floating the river, and having access to the public lands there if a matter of critical concern to our group. On every trip we observe an abundance of wildlife including a number of special status species including: Bald Eagles, Western Yellow-billed Cuckoos, Willow Flycatchers, Yellow Warblers, and River Otters, in addition to the salmon.

I29-C

My review of the DEIR/DEIS that it does not evaluate the cumulative effects of the proposed project and associated flood control reservoirs on floodplain habitats and the fish and wildlife resources of the Feather River and its tributaries in sufficient detail. The system of dams, levees, canals on the Feather River and the urban and agricultural they support in the study area have contributed to the precipitous decline of fish and wildlife resources. Spring-run Chinook salmon on the Feather River are endangered and fall-run salmon are greatly reduced. The decline of these fisheries has imposed severe hardship on commercial fisherman and deprived recreational anglers of a value past time and food source. Salmon and other fisheries like the Sacramento Splittail are dependent on inundated floodplain habitat for reproduction or nursery habitat. Floodplains are also a source of primary and secondary productivity for a number of other fish and wildlife species.

1

I29-C cont'd

Oroville Dam, project levees, particularly in the lower portion of the study reach, agriculture in the flood way, historical dredging activities, and local berms constructed to reduce the frequency of agricultural land in the floodway have all contributed to the decline of floodplain habitat, and by extension, fish and wildlife dependent on those habitats. Modern perennial agriculture (orchard) in the floodway is only possible because of the regulation of the Feather River by Oroville Dam and the state water project, which has further reduced the area and frequency of inundated floodplain habitat.

I29-D

The same can be said for terrestrial and avian species, particularly migratory birds. The river floodplains historically provided wetland habitat for millions for ducks, geese, swans, shorebirds, and host of other water birds that over-winter in the Central Valley, particularly in the Sacramento Valley. Those wetlands were reduced to below 5% of their historical extent due to the construction of levees and other land use changes. An important recreational resource and industry is now dependent on artificially flooded lands and subject to the uncertainties of water supply, electricity prices, farm practices and government appropriations to sustain them.

I29-E

The proposed project to build the levee in place does not create any additional flood conveyance capacity and therefore any future efforts that could conceivably decrease flood conveyance would be viewed by local, state, and federal flood management agencies as an impact to public safety that must be mitigated. The project would facilitate additional urban development in the levee "protected" floodplain increasing the public safety imperative and thus aggravating the perceived, if not real, conflict between public safety and fisheries restoration. The very best way to protect public safety, particularly against the increasing storms that climate change will bring, is to give the river more room to safely convey flood flows. Giving the river more room also allows for other uses of the floodplain such as recreation, trails, wetlands that filter and cleanse water, and to improve fish and wildlife habitat.

Thank you for considering of my comments.

Sincerely,

Edward C. Beedy, Ph.D.
Wildlife Biologist
12213 Half Moon Way
Nevada City, CA 95959

2

Response to Letter I29

I29-A

Between the publication of the Draft EIS/EIR and the final version of these documents, SBFCA worked intensively with representatives of the environmental community led by American Rivers to come to a better understanding of the flood-risk characteristics of the study area and downstream and the feasibility and efficacy of alternatives available to reduce flood risk. Through those conversations and documented in the supplemental comment letter signed by the coalition of environmental organizations, it has been acknowledged that the range of alternatives is considered adequate. Specific to improving fish and wildlife habitat, the SBFCA Board and the coalition of environmental organizations have agreed to a memorandum of understanding (MOU) that commits to pursuing several identified multi-benefit actions for floodplain restoration, and others that may be identified through the Feather River Regional Flood Management Plan. Constructing the FRWLP is essential as the foundation upon which restoration building blocks can be laid. Comment did not necessitate change to the Final EIS.

I29-B

Comment noted. Comment did not necessitate change to the Final EIS.

I29-C

It is agreed and acknowledged that historical degradation of habitat has been severe and fish and wildlife have declined in population and biodiversity. However, these conditions are part of the existing environment at the time of the noticing and analysis for the project and therefore are not factored cumulatively. In fact, the project has undergone several iterations of extensive avoidance and minimization to result in a project with minimal effects and streamlined approval processes through the permitting agencies. The project represents a “no regrets” action for flood-risk reduction that allows for substantial restoration of fish and wildlife habitat in the floodplain. Comment did not necessitate change to the Final EIS.

I29-D

It is agreed and acknowledged that wetland habitat for over-wintering birds has been subject to loss since the mid-19th century. As discussed in the response to comment I29-A, specific to improving fish and wildlife habitat, the SBFCA Board and the coalition of environmental organizations have agreed to an MOU that commits to pursuing several identified multi-benefit actions for floodplain restoration, and others that may be identified through the Feather River Regional Flood Management Plan, including wetlands. Constructing the FRWLP is essential as the foundation upon which restoration building blocks can be laid. Comment did not necessitate change to the Final EIS.

I29-E

In general, the comment is accurate for much of the Central Valley; however, the specifics of the Feather River system in the study area differ from much of the Central Valley. The dam and reservoir at Oroville were constructed after the Sacramento River Flood Control Project was authorized and after the 1957 profile was established as the design standard for the system. A result of this circumstance is that the levee heights are well above the design flow that the system is intended to convey. Beyond levee height, the levees along the Feather River are considerably set

back from the active channel of the river, providing a floodplain that is substantially greater than most of the rivers of the Central Valley, in many places thousands of feet wide. The combined effect is that the Feather River in the study area is not limited by conveyance capacity as a significant flood-management risk. Multi-benefit floodplain projects as mentioned in the comment are very achievable in the existing configuration of the levees. Farther downstream in the system, conveyance capacity becomes more critical, and it is for this reason that the project stops 4 miles north of the confluence of the Feather River with the Sutter Bypass—to allow for a potential future setback levee. As discussed in the response to comment I29-A, the SBFCA Board and the coalition of environmental organizations have agreed to an MOU that commits to pursuing several identified multi-benefit actions for floodplain restoration, and others that may be identified through the Feather River Regional Flood Management Plan, including evaluating this action, a setback levee south of Laurel Avenue. Comment did not necessitate change to the Final EIS.

Chapter 5
Comments Received at Public Hearings and Responses

This chapter contains the comments received on the Draft EIS/EIR from attendees at three Public Hearings. One hearing was held on January 15, 2013 in Gridley and two hearings were held on January 16, 2013 in Yuba City.

Each comment within the transcripts of the public hearings has been assigned a unique code, noted in the margin. For example, the code "PH1-A2" indicates the second distinct comment (indicated by the "2") by the first commenter (indicated by the "A") in the first transcript (indicated by the "PH1") received during the meeting. The chapter presents each transcript followed by the responses to the comments within that transcript. Table 5-1 summarizes the commenting party and date of the comment.

Table 5-1. List of Individuals Providing Comments at Public Hearings

Code	Public Hearing Commenter	Code	Public Hearing Commenter
Public Hearing 1, January 15, 2013, 6:00 p.m.		**Public Hearing 2, January 16, 2013, 6:00 p.m.**	
PH1-A	Sam Alexander	PH2-H	Frank McCarley
PH1-B	Dan Cole	PH2-I	Frank Coats
PH1-C	Mr. Romando	PH2-J	Lawrence Burns
PH1-D	Kathy Hodges	PH2-K	Unidentified Male
PH1-E	Unidentified Male	PH2-L	Vicki Stevenson
PH1-F	Ron Roman	PH2-M	Unidentified Male
PH1-G	Eugene Mason, Jr.	PH2-N	Unidentified Female
PH1-H1	Jeff Fredericks	PH2-O	Unidentified Male
PH1-H2	Darlene Fredericks	PH2-P	Unidentified Male
PH1-I	Sandra Waller	PH2-Q	Roy Stevenson
PH1-J	Justin Kelly	PH2-R	Unidentified Female
PH1-K	Jeff Hughes	PH2-S	Frank McCarley
PH1-L	Unidentified Male	PH2-T	Unidentified Male
Public Hearing 2, January 16, 2013, 3:00 p.m.		PH2-U	Unidentified Female
PH2-A	Vince Hamilton	PH2-V	Andrew (?)
PH2-B	Unidentified Female		
PH2-C	Al Sawyer		
PH2-D	Rick Small		
PH2-E	Unidentified Male		
PH2-F	Ryan Shore		
PH2-G	Jerry Orr		

Public Hearing 1, January 15, 2013, 6:00 p.m.

Public Hearing
PH1

---o0o---

Feather River West Levee Project

Public Meeting

Tuesday, January 15th, 2013

Gridley Veteran's Memorial Hall

249 Sycamore Street

Gridley, California

6:00 p.m.

---o0o---

Reported By: Jillian M. Bassett, CSR No. 13619

1

I N D E X

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PRESENTATION

Good evening and thank you very much for coming out this evening. This is one of three workshops that will be given. Tomorrow night there will be two in Yuba City. And this is for the Feather River West Levee Project, and specific to the environmental process for the National Environmental Policy Act as well as California Environmental Policy Act and the Environmental Impact Statement/Environmental Impact Report that is out on the street right now.

We have about a 15 to 20-minute presentation. First I'll tell you, I am Chris Elliot. And I am an ICF consultant consulting for the officers here in the Valley, Sacramento as well as in Redding. And we are working as consultants for Sutter-Butte Agency and are engineers in preparing the environmental document.

So I'm joined this evening by Mike Inamine, the Executive Director of the Sutter Butte Flood Control Agency, hand up there in the back. And then we have Mike Bessette who is the Director of Engineering, Sutter Butte Flood Control Agency. And they are full-time, dedicated agency staff.

And the agency is also supported by a number of consultants also there in the back. You probably know

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Kim Floyd. And she assists with outreach efforts through the assessment district process the past few years to fund this project and get levee improvements.

Also joined this evening by Mary. Where is Mary? She stepped out. But Mary is the manager for the environmental and state -- there's Mary walking in through the back there.

And we also have Chris Kirvanec, who is leading the design team for the project.

Other consultants assisting this evening -- many of you were greeted by either Michelle Osborn in the back or Ingrid Norgaard in the back.

And also we're joined by Jillian who is going to be recording this evening's meeting in terms of questions and comments. So we do ask you to speak up.

The way we're going to run this is, it's about a 15, 20-minute presentation. And then if you have general questions or comments, we will take those as a group. But we understand that also a number of questions and comments may be very specific. So we have a large team to assist so we can take those questions one on one.

And then also this is an official meeting in terms of Environmental Health Review Process. The Draft Environmental Document is out on the street. We are here to take your comments. And that's one of the reasons

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Jillian is here. So you can go to Jillian and she can record your comments verbatim, and they will be addressed in the final environmental document. And we also have these comment cards that we invite you to fill out with us this evening or you have an opportunity to send them back later. But those are two ways that are available to us this evening.

So there's Sutter Butte Flood Control Agency on one part of this project acting as a sponsor, and ultimately the agency that will certify to see the document and document project and is trying to move that project forward. But it can't happen with only the force of one agency.

Also the Corps of Engineers is here as well. The Corps has certain authorities over the project to modify federal project levees and also jurisdiction through the Clean Water Act of any affects on waters of the United States.

So representing the Corps this evening we have Adam Riley standing in the back. Adam is the Corps Project Manager. Because this has a certain authorization required that's called 408 Permission, Adam is the operation section of the Corps here in Sacramento and is overseeing that permission for the project.

Adam is assisted by Jeff Koschak. And Jeff is

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there in the back. Jeff is the environmental lead, specifically the NEPA or National Environmental Policy Act practitioner, making sure the document and the process are compliant with those perspectives.

And we also have Matt Davis who is there in the back. Matt is working on the feasibility side of things.

Some of you were here with us about a year and a half ago when we had scoping meetings. And scoping was an opportunity where SBFCA and Corps and other acronyms describe -- the Sutter Butte Flood Control Agency will sometimes appear like that.

But we held joint scoping meetings. There are two parallel companion processes. One of them is specifically targeted at trying to get construction this year and be the start of successive years of construction for about 41 miles of the west levee of the Feather River.

There's also a companion setting that is the Corps of Engineers led feasibility study with the state of California and Sutter Butte Flood Control Agency and nonfederal sponsors, which determine the federal interest in a project that ultimately would have to be authorized by congress as well as a procreation set at the federal level. So that study is underway. We're not here specifically to address the feasibility study, but we obviously have members of the feasibility team here if you

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do have questions about that.

So, again, the focus is on the Feather River West Levee Project, which is identified by the Sutter Butte Flood control Agency.

So I interrupted myself a little bit there. We have other members of the Corps of Engineers team who are here. Laura Whitney is the Corps Project Manager for the feasibility study. And I think I caught all four members of the Corps of Engineers team.

We also have two board members from the Sutter Butte Flood Control Agency. And they are elected members of that board. Bo Sheppard as well as Gary -- Gary. There we go. Right there.

And we also have Steve joining us this evening who is a representative from our office.

All right. So let's get into the presentation stuff.

I guess a little bit more housekeeping before I get into that. We did have handouts that were up in the front table, because that is what we're here for this evening. Whether it's spoken comments that you have, questions that you have, we need your feedback and input on the project to ensure that we are getting the record straight in terms of how the document is going forward with its analysis and effects, etc.

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But all the right considerations are in there because we have an expert team that's pretty well at knowing what the resources are. But the individuals who are in the community and interested in the project know the river and know these levees, and we definitely want to have your input into the process.

We also have a copy of a brochure that has been mailed out. Many of you probably were aware of the meeting because of this. But there's additional copies here. We have a few copies of the presentation available as well. And in addition to that, we have the agenda and what was the original official public notice for this meeting.

One other resource that we have available, we have about ten copies of these map books. And the reason we brought these is we're very aware that most of you probably have direct interest in what's happening on the grounds of the levee. So we have these map books which are reprints of some of the plates and figures that are in the environmental document. So the members of our team, we can take these out and lay them out with you. And if you do have specific questions about what are the proposed footprints alternatives or what fixes might be proposed in any given area, we're here to talk about that. If you have questions about that.

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So, again, focus on the environmental process. And we are here to address some questions on the feasibility study, even though that's not the specific purpose.

There was an article in the *Appeal Democrat* this morning that some of you may have seen and, we definitely appreciate getting the word out. But just to clarify, we're here for the environmental process. We're here to talk about the project planning, the alternatives, what's going to happen in terms of construction on the ground, what the environmental effects might be. But specific questions to project design is not necessarily focussed on this meeting.

All right. So a quick run through. The demonstration is divided into four basic parts talking about how we got to this point in terms of deficiencies in the levees and what's needed to address those deficiencies. Take a little bit of a closer look at some of the measures that are proposed and how they're going to combine alternatives, and lastly looking at how all of those get wrapped for the environmental process for good transparent public disclosure and getting your input in the process and making sure that we're putting the appropriate documents out on the street. But more importantly, an appropriate project is getting planned and

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implemented.

Okay. So about that project background. So the Sutter Butte Flood Control Agency is a public agency. And who is the Sutter Butte Flood Control Agency? They are the joint powers authority. Which means there are individual public agencies who are acting as a single unit in terms of making decisions and executing the project. And specific member agencies are the counties of Sutter and Butte Levee Districts 1 and 9, as well as the cities of Gridley, Live Oak, Biggs and Yuba City. So all of those agencies working cooperatively and together in the public trust to move forward with the project.

So the Feather River West Levee Project was initiated after an assessment district was formed to provide a local share of funding. And the specific purpose is again to treat the 41 miles that start all the way at the upper end in the north at Thermalito Afterbay and extend about three or four miles north of the confluence of the Feather River with the Sutter Bypass. So it's that reach of 41 miles that is the specific focus of the study and where the improvements are most needed to protect the basin.

So construction is slated to start in 2013. And we are working aggressively toward that schedule from a design prospective as well as environment planning;

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securing all of the permits. Some of which are environmental, and some of which are not. And Sutter Butte Flood Control Agency is coordinating with the state of California as a partner in this process. We can talk more of that in a few minutes how the state is engaged in this.

And, again, as a reminder, one of the reasons we're here, NEPA and SEPA both require that there is a public process and opportunity for input into that process. And an EIS/EIR is a main mechanism in which that happens. And that went out on the street in late December. And that's why we're here this evening, at least in part.

So a little bit more background in terms of how we got here. And many of you know this as well if not better than we do. But a broad brush of some of the factors for the Feather River West Levee project, prior to 1850, prior to European settlement here in the Valley, Feather River and Sacramento Rivers frequently overtopped the banks. There was natural levees created over geomorphic processes to a certain degree. But that was a character of the Valley. A lot of the seasonal wetland and mosaic in the river channels weren't always necessarily just a single channel intermixed with public. And that changed dynamically over time coming out of

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Sierra and soggy conditions for some of the plans in the Valley contributing to pondering areas and overflow.

So in the mid 1850s what we started to see was that was the period after gold was discovered in California. And we were looking at people for better and more efficient ways was fracking that gold out of the rock. And one of the methods that was used to do that was hydraulic mining. Hydraulic mining had the effect here of flushing down millions of cubic yards of sediment that were blasted away. Just like if you were to stick your thumb over the gardening hose, the force of the water was very effective in removing entire hillsides. It was good for removing gold, not so good for here in the Valley where river channels became choked up, which was a problem for -- it was a problem that further exacerbated the flooding, because the channels could no longer hold the water that would facilitate the development and agriculture and everything going on around and in the communities.

So then what started to happen was individual landowners would build levees to protect their lands. They would get together and over time the levees that were built on individual parcel basis became more of the network that was ultimately adopted as the Sacramento Flood Control Project in early 1900s. So since then that

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does not mean that just because we have an official project that we are managing cooperatively that we can stop all flaws.

And the flood management continues to be a problem today. As we know in this community, flood risk is ever present. And there have been several disastrous floods within the last hundred years. 1955 was a major event. Shanghai Bend killed more than 38 people. Thirty-eight were documented, and it's known there were many others who weren't part of that recorded number.

1967, Oroville Dam and Reservoir were completed that add some additional storage into the system. And one of the things it means to the engineers is because the levee heights were pre-Oroville, we don't really have an overtopping problem here on the Sacramento or in the Feather up in this part of the Valley. But when we hear on the national news back in Mississippi where flood stages can be breached, and then people often will pile sandbags and get together. That's not so much how floods have occurred in this part of the Valley. It's not that our levees aren't tall enough, it's that they're not strong enough.

A lot of the levees are basically made from whatever material was on hand. Whether it was dredged material out in the river, whether it was sands, other

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alluvial deposits. Those things might have been readily available close by, but from an engineering prospective they don't build a very good levee when you look at standards that are put forth by the Engineers as studied by the Corps at the state level by DWR Department of Resources in Central Valley.

In 1970 beyond Oroville, New Bullards Bar Dam and Reservoir added flood storage as well. But still problems exist. As evident in 1986, 1997, we had additional major flood events where tens of thousands of acres were flooded, and more loss of human life.

So it's those circumstance that have brought us here and why these levees have continued to be studied and why we know that further improvements are necessary to the flood management system. So these deficiencies have been -- some of which have done by the Corps of Engineers and some specifically by the Sutter Butte Flood Control Agency. And in light of the results of what those studies have been telling us, that is what has contributed towards the community passing the assessment district to help fund the improvements that need to go in.

So, again, this is also a good time to talk about the companion study, again, that's being led by the Corps of Engineers to determine the federal interest in the project. But if a project were to be authorized, again,

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that would have to be done by congress. And there's not a time certainty of when that would happen. And there would have to be funding appropriate at the federal level to allow that to happen. And that's also not a certainty. As we all know, federal government process -- well, I'll leave it to you to decide whether it works or doesn't work.

But any way, that is why there's a need to act locally. Because we have the funding that is available as passed by the voters, and which has contributed to hundreds of millions of dollars and capital improvements like this project, matched with local dollars provided by the community.

So taking a more in-depth look at the Feather River West Levee Project, itself, and talking about the study area. Once again, focused on the 41 miles that are on the west bank of the Feather River and is intended to decrease flood risks and improve flood management for the communities of Live Oak, Biggs, Gridley, Yuba City and incorporated areas. So the project is intended to protect the existing population, and to increase protection of the population, as well as all of agricultural infrastructure that it's part of.

So this is a map that shows the study area. The green shading shows the boundary of what the Corps of

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Engineers is looking at in their feasibility study. This red-dashed line that you see that is just east of Highway 99, that's the Feather River West Levee. And that is what is the subject of the project that we're talking about this evening. So it's that 41 miles that is on the extreme north up by the 70 shield that come up all the way down by, not quite reaching, just about three or four miles upstream or north of that confluence. That's the project boundary that's under study, and is the subject of this EIS/EIR which is acting as a stand for our projector this evening. Hopefully you find it more useful than that.

So the primary problems and the -- so I talked about how the levees in our area not so much that they're not tall enough, they're not strong enough. More specifically, what we mean by that, putting it in technical terms, are the deficiencies of through-seepage and under-seepage. And those are culprits that plague our levees.

We have a diagram to look at in just a moment that takes a closer look at that. And the treatments that are typically employed are to provide barriers right through the core of the levee that is less permeable than what the apparent material is within that levee and its foundation. And that is one mechanism that can be used.

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The other method is it can bolster the backside of the levee and provide essentially a section so its seepage will pop up on the land side and create boils.

Let's look at the diagram that shows that a little bit more closely. So those two primary phenomenon is what produces when the river stages are higher. So you get increased flood stage in the main stem of the river, the flood plane gets inundated, and then it creates force. Water weighs a lot. It has a lot of pressure behind it. And that hydrostatic pressure is causing the water to not only flow down the channel -- especially when the channel is high, there's a lot of push back against that water. The water wants to move out laterally from the channel. Because the levee is there, it will find the path of least resistance. And what that means is water will seek sandy spots. And you'll start to see those sandy spots get exploited by the water.

When the water is leaking through the levee, that's not so much a bad thing. It's not our favorite thing in the world, but it's not so much a bad thing. But as that water increases velocity, it starts to carry the soil material away with it. And that's when you see the levee face on the backside start to erode, or you start to see sand boils that pop up on the landward side of that levee.

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So those are the primary deficiencies that we see; water moving through, and it starts to blow out the backside of the levee, or water moving underneath that boils up on the land side of the levee. And either one of those is because the levee can collapse right from the place of where its foundation was, if under-seepage gets to be great enough, or the levee can wash away on the landward side if the water gets through, and starts to carry that soil material away with it.

So the project is looking at measures such as a slurry cut off walls to provide seepage barrier or looking at berms on the landward side of the levee. There are other measures being looked at as well, more localized or site-specific treatments. But those different measures have been combined in overall alternatives that are describing the environmental document and that the effects analysis has been conducted on the environmental document.

So just to give you a brief overview of what those alternatives are; Alternative 1 looks at those measures that if we were to put on the blinders and look through the lens of it, if we wanted to stay primarily within the existing levee footprint, what fixes might we implement and what could we achieve with those fixes? That's what the Engineers have devised as its Alternative 1. So if we were to maximize slurry cut off

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walls and other things that stay within the existing levee footprint, could we achieve a project that meets all the objectives? That's Alternative 1.

Alternative 2 basically removes those blinders, the same as the levee footprint does. If we were to have a little bit more land available to us and use a combination of berms or other factors that take a little bit more real estate, does that contribute to a project that is more effective from an engineering perspective and flood management perspective, than if we just stayed within the existing? That's Alternative 2.

Alternative 3 looks at those thing in combination. If we took the best of Alternative 1 and the best of Alternative 2, with a known fix that has a high level of confidence and credibility behind it and blended those two alternatives. So here we can stay within the levee, and here we'll move a little bit outside the existing levee. That's the blended alternative. That's alternative 3. It also happens to be what's known in the document as the applicant-preferred alternative for the project. The Sutter Butte Flood Control Agency proponent has declared as the preferred alternative to move forward with.

So each of those three alternatives is analyzed in equal level of detail on equal footing within the

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document. But Sutter Butte Flood Control Agency has called that third alternative the preferred alternative that they are -- looks like it has the best bearings, based on available information today.

So your comments on the EIS/EIR, it's within the scope of what you may comment on. You can comment on those alternatives, and also the effects analysis that is done on each of those alternatives.

So the project cost is estimated to come in at around 300-million dollars. The state looked through those propositions that were passed by the voters of California, that were 84 and 1-E. The bonds that were the results of those propositions were paid for, roughly 76 percent of that, with balance being paid through assessment district funds being raised right here within the community.

The environmental process. And I've already said a lot of this, so I might skim over a little bit of this material. There are two environmental regulations that are the primary focus of the environmental document. At the federal level there's NEPA, that is National Environmental Policy Act, and CEPA, California Environmental Policy Act. And these two acts call for the analysis of effects not only on the ecology or the natural environment, but also the built environment. So if you

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look at the topics covered in the document, we're looking at the effects on land use, we're looking at effects on agricultural resources. We're looking at economic effects.

So when we talk about the environment, it's not really the -- it's a good thing to keep in mind, but it's also very much the things that affect the community that are covered in the context of the environmental document. So at their core, what both of these environmental laws call for is that there's good transparent public disclosure of what the activity is that the government is looking to undertake. But also that the -- it's also looking at the effects of different -- of the different project alternatives based on those topical categories.

And so I think I covered all the material on that slide.

So the fact this is a joint document -- what joint means is that it is more efficient. It is more efficient for the agencies, it is more efficient for the public, it's more efficient for decision makers, it's more efficient for any other reviewers and stakeholders. That if both CEQA calls for SBFCA and the Corps of Engineers in granting permission for the project under the Clean Water Act, if they have to essentially look at the same study area, it's the same activities contemplated, the same

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effects that those activities might have, then it would be done under single cover. And what's meant by the joint document. Corps of Engineers and Sutter Butte Flood Control Agency have worked cooperatively in terms of disclosing what their potential action might be.

So there's a specific permission that I described in the beginning that is required from the Corps of Engineers. Grants through the state of California, specifically the Central Valley Flood Protection Board to the Sutter Butte Flood Control Agency to move the project forward, and that is Section 408. And Section 408 refers to 33 United States Code, Section 408. It's also codified as part of the Rivers and Harbors Act of 1899. But beyond all that legalese, essentially what it calls for alterations or modifications of the Federal Flood Control Project. Which the Feather River is part of Sacramento Flood Control Project requires permission from the Chief of Engineers to allow that modification. And that's important.

The reason it's important is that as individual entities might contemplate changes to the system, it might improve conditions at that localized site. The system needs to be looked at, and the integrity and original function of the flood control system must be preserved so that flood risk is not inadvertently being misplaced or

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transferred to another party. So the federal interest is maintained. And it needs to be ensured that the project is not injurious to public interest.

So those are the foundational parts of why Section 408 is important. If we were to do an action here, we need to make sure upstream, downstream, adjacent areas aren't harmed and the overall system is functioning as a system.

Okay. And the approval through 408 permission is dependent on what is the type of modification. There are deferent levels, because scope and scale of this project and the fact that ultimately Sutter Butte Flood Control Agency is seeking federal crediting of how this project may ultimately be deemed compatible and consistent with the project understudy from the feasibility study, that it could be -- these improvements could be credited towards that project. So this is called a major 408.

408 approval is dependent on looking at the technical merits of the project, ensure that engineering standards are being adhered to that would ensure the integrity of the system, and that it's not causing potential damage to the levee. The appropriate documentation is being done because there's a standard of care in terms of how the engineering project is being implemented, constructed, and the standard in which it

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must be maintained. The Sutter Butte Flood Control Agency is supported very closely with Corps to ensure that all of the spirit as well as the specific words of 408 are being appropriately and completely followed.

Okay. So why hold this public meeting? We've talked about this. It's an opportunity for your voice in the process in terms of alternatives that are analyzed; the setting for affected environment, to make sure it's appropriately scoped; the affects, the way they're described are accurate and the findings made on those affects in whether they're significant or not; and if they are proposed and fair litigation.

It's an opportunity for you to hear more about the project and be able to talk to some of the representatives of the design and project team about what the project entails. It's an opportunity to talk to the Corps of Engineers about the feasibility study. And also -- this is more superficial -- but that it's complying with basic requirements of the law.

So based on public scoping and based on meetings with individual stakeholders as well as some of the agencies who have their public trust, certain resources for the project such as U.S. Fish and Wildlife Service, National Marine Fishery Service, at the federal level. At the state level there are a number of agencies who have in

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their public trust resources that might be affected by the project. There have been comments that have been received throughout that process. And these are just some of those that we know and that the document takes special care to look into these issues in depth.

So it's construction-related effects: Those things such as air quality; the noise that would be generated from construction; temporary loss of access or disruption of utility; temporary traffic that might be affected in terms of additional truck trips that would be on the roadways or temporary closures for safety. All of those types of temporary affects, which would only be specific to the time that the project would be built, are described in the document.

There are also property-acquisition effects described in the document. Some of those are short term where things are needed to be able to provide access to build a project. Some of them are more in terms of where the project footprint might propose a permanent alteration, such as through construction of a seepage berm. Or where there is more of a need to acquire for long term own impact. So those affects are described in the document.

River access for public recreation. These rivers, they provide us water supply for irrigation and

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for domestic use for our homes and businesses. They provide so many things. They provide for so many things. They provide for recreation opportunities, but they also put us at flood risks. But looking at positive attributes of what water can do for us at the right time and in the right volume is certainly something that's described in the document and then places for the water supply and water quality recreation prospective.

Vegetation removal. The Corps has a levee vegetation policy that has had reinforcement over the last few years. And some of the levees, there's segment of the levees are not directly in compliance with that policy, and there are different mechanisms that are available to bring the levees into their compliance. Those are described within the document.

And climate change and sea-level rise are also topics that are discussed. Both in terms of how the project construction activities may contribute to additional greenhouse gases and that may have an affect on climate change and then also how sea-level rise factors in hydrology and how the project needs to be designed.

So the public comment period, again, is important. And that's what we're here for this evening. We do have a deadline for comments, which is February 13th for which they must be received. Many ways you can submit

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those comments; post-marked, faxed or time-stamped, either through e-mail, before or on February 13th, 2013. And then those responses will be published in the final EIS/EIR for the Corps environmental report for Sutter Butte Flood Control Agency. And those comments that are received will be formally responded to.

So these are all different ways you can comment. There are many mechanisms available.

And if you choose to send comments in the future, either through hardcopy or through e-mail, these are the addresses that have been published in numerous places, but also here for your convenience again. You can send them to Jeff or Ingrid. And I'll leave it back on the slide so that you can have the opportunity to take those comments.

So let's see -- did we have any material here? No, we don't. So what we want to do now is if you have general comments or general questions, we will take those as a group. Because that's only most efficient. If you get the opportunity to hear each other's input, and because the questions you have might very well be what your neighbor's questions, too. But if your questions and comments are very specific, or if you choose to not do them in a group setting, we're here as long as you need us here this evening.

Along with me, we can take your individual

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questions and comments, and using these map books to look at certain areas directly on the ground and what the project is for alternatives.

Also we invite you to come talk to Jillian specifically, and she will take your comments.

But coming back to what we discussed here as a group, what we do is we are recording this meeting in its entirety -- Jillian is. So we ask that you state your name for the record. And if you do provide a questionnaire comment here for the group, after we conclude the group part of the dialogue, if you could go up to Jillian just to make sure we have your name spelled correctly for the record. We would definitely appreciate that.

So that concludes the presentation, and we are here for your questions and comments.

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PUBLIC COMMENTS

SAM ALEXANDER: Has it ever occurred that, for instance, during '97, that they have actually photographed water levels along the length of this levee to see where it's actually impacting the levees?

MR. ELLIOTT: That's a good question. So just to repeat that for the group, the question was about the 1997 event.

SAM ALEXANDER: Or any high-water event.

MR. ELLIOTT: Or any high-water event, with 1997 being one example of that, what records do we have in terms of what the actual level was and what damage was done to the levee at those higher --

PH1-A1

SAM ALEXANDER: Throughout the length of the project.

MR. ELLIOTT: Throughout the length of the project. If that's accurate to paraphrase.

So Michael, what do we have in terms of the documentation of how this 41-mile reach of the levee performs during a high water event?

SAM ALEXANDER: The reason I ask the question is because along my property, since it was built, the water has never reached the base of the levee.

MR. INAMINE: I understand. So I'm going to try

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and get directly to your question, and then we can talk again later after this discussion and get some specifics about your property.

So in 1997 -- and I can only speak for my personal experience -- there was a high-water stake that was done by a variety of groups, high water staking. And so the high water staking was done in '97. And to be fair, the staking was done -- it wasn't consistent throughout the river system. But that was used to collaborate models -- computer models that were used to describe what levees need to be following the accident and why they need to be fixed and what type of fixes we were going to put into them.

So there was high-water stake. And I personally saw some stake that was done, and it was not real consistent. Now, in your area, we can talk about that. That was one of those areas that did not get wet, which was significant about high-water staking is depending on where you were during the system, which is a 150-year event, just depends on how much water was coming.

PH1-A2

SAM ALEXANDER: Where the levee is part of the canal system -- is part of the canal, was essentially two levees. One side on the canal and one side on the other. And there's no hydraulic effect. Even if it came in contact with the levee, there would be no receivers to

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PH1-A2 cont'd

keep the water in the levee. There would be no holding water from the side of the canal, at least 70-years canal itself. Why didn't they participate in the leakage from water coming against the levee if there's no hydraulic pressure? It seems to me contradictory.

MR. ELLIOTT: That might be a good question for Engineering Team, Michael Bessette.

Would you address that?

MR. BESSETTE: That's a great question. And we're very familiar with what you're talking about.

So we have the levee and the canal going through. And so it goes deeper than the levee itself. And in fact, I think the canal levee, when we analyze it, like Mike was saying before, we're using a 100-year event. We're looking at it and a certain procedure, Corps of Engineers, to look at under-seepage underneath the levee. And part is there's an opening. And I think, as you know, that canal is dry February or March. It's about eight-feet deep.

PH1-A3

SAM ALEXANDER: Why would you keep it dry if there's flooding?

MR. BESSETTE: For that exact reason. If there were a flood event in February or March and the canal is dry, that is the condition we want. And that's actually the time of year it could occur.

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PH1-A4

SAM ALEXANDER: But the whole reason they couldn't let water in the levee were circumstances.

MR. BESSETTE: We've talked about that. And we talked a bit more about it as canal operators. It's a possible option, and we're still working through design features. But what they did when they built the canal, is water pressure was coming underneath the levee and there was pressure going up against -- when they build the canal, the blanket got very thin and kind of created a worsening condition.

PH1-A5

SAM ALEXANDER: Well, if there's two levees; one on one side and one on the other --

MR. BESSETTE: And that's another thing we're considering with the other levee there. What if the river levee breaches into the canal. What happens? And with that consideration, it's one of the areas of lower risk. So we're still looking at that and working with Corps. How you consider that's the project levee of flood control and you do have bank on either side, how does that whole system work? And we're still evaluating that. I know that doesn't completely answer your question, but that's --

PH1-A6

SAM ALEXANDER: If the canal is for 70 years and hasn't leaked, it's not likely to.

MR. BESSETTE: There have been other areas where

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there have been serious floods where the canal has been dry and flood was up. So it's very -- still a very big concern. We can talk more afterwards.

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PH1-B1

DAN COLE: I've lived here for all my life. They built the dam; they said there would be no more floods. It would be gold, the water. And it seems to me, if they regulate the lake level, we would not have to worry about our levees. They get greedy and hold back the water and then when the snow melts, it floods. They have to open the flood gates like they do in water packs that fill. It is rivers. Why can't when they get heavy, open the gates up and let a little more out? Keep it down so it evenly springs out? I mean, we shouldn't have to worry about levees.

MR. ELLIOTT: So the question is about how reservoir operations factor into flood management. And the reservoir, would that take pressure off the levees or be the need for levee improvements?

MR. INAMINE: So you're absolutely right. That's what Oroville -- that's a large part of what Oroville project was about, which was financed by the State Water Project, State Water Contractors. But there's 750,000 feet of storage in Oroville Dam for the purposes of flood control. So when water hits reservoir, big peeks of high volumes flow that normally come down through the system are continuant and stored in the reservoir and released gradually -- not released gradually enough, like in 1997, and in other occasions. But there's always a tradeoff,

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just as you're pointing out.

I would take maybe a biassed approach to this, but there's always a tradeoff for water and water supply and keeping enough empty space for wet part of the season in order segway the floods. That's always a -- I will say that if you look at the flows down the river, pre-Oroville and post-Oroville, there's a big difference. I mean, it has greatly reduced risk downstream and is an example of that everywhere else in the system in Central Valley.

Virtually everywhere levees got to be raised or forged, or channel capacity has to be -- we're fortunate because Oroville, we don't have to raise levees because these levees were essentially overbuilt. They're higher than they need to be because they were constructed pre-Oroville. So while in a perfect world if Oroville was being operated strictly for flood control, you might get more benefit out of it if it was paid for by essentially State Board Contractors. And a lot of that flood benefit is provided by all of us or at least we reap the benefits in stages.

DAN COLE: They should pay for the levees. If Southern California wants our water, they should pay for our levees. **PH1-B2**

MR. INAMINE: There's a lot of folks who would like to have Southern California pay for that. That's

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probably more of a political solution about how the system is set up. I can only speak to the way this system was constructed way back and was turned over to the federal government and the Corps of Engineers as the authorized system. It was never part of the flood -- the state water project system that it is now is part of it.

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PH1-C1

MR. ROMANDO: While we're on the topic, I wanted to ask -- it sounded like the state, there was a set amount of money that was coming from the state? 270 -- I don't know.

MR. ELLIOTT: What's the exact amount?

MR. INAMINE: Well, roughly, the project was about 300 million, and 75 percent was from the state -- throughout the state.

PH1-C2

MR. ROMANDO: And that 25 percent is to come from local --

MR. INAMINE: Assessment.

PH1-C3

MR. ROMANDO: So is there any control -- many projects run over budget. If this goes over by a few hundred million, which is possible, is there any control? Does the state funding increase to that 75 percent or does it remain set at that pre-project level and the taxpayers are responsible for whatever runs over budget?

MR. INAMINE: Okay. That's a complicated question. Let me try.

I think I know what you're after. Spare me where I go wrong. Okay. So this is funded, the money to pay the state, our 75 percent is all bond money. And there's just so much money available for this type of project. And it's budgeted and authorized through the state budget process. So when it's gone, it's gone. The assessment

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money that leverages that later amount to a certain extent, that's a pretty tight budget, too. It is tough getting assessment passed. There's not a lot of local money used. So as far as we're concerned, that's it. That's the money we have allotted to do this project. That's what we're going to stay within that budget.

Now, there's another federal interest in the region, and Chris described it earlier. And that is the federal feasibility study. So this 408 project that we're talking about here, this is all state, local money. This is a local project that we're going to build in advance to the Corps of Engineers. But the state doesn't just say, "Here's 200 million. Go do good things with it." They say, "We want to make sure you guys stay coordinated with this other Corps feasibility study. Make sure you do something that the Corps will likely build so that if you build something that looks a lot like the federal project, in five or ten years, that we get credit for it." We as in the state gets credit for it.

That does two things; it leverages more bond money so we can spend it on other projects, other projects within the basin. But it's also a good backup plan. Most of you may be aware of what's happening down south. SAFCA, just as you described, got a local assessment, 75 percent funding from the state of California. But they

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didn't complete the ring around Natomas. So the backup plan was to have the Corps of Engineers, because they had the federal study that was completed backup plan, was to have Corps of Engineers finish the job. It is not our intention to do that, obviously, here. And we have more strict -- we have more difficult financial issues to address here. We're not like the welder communities in Sacramento.

But that's still a pretty viable backup plan is to have two things going on; state local funding to do it ourselves here for our project, and if for whatever reason something goes awry, then we have a federal project to support completing the job.

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PH1-D1

KATHY HODGES: Would they stop in the middle of this because they were three-quarter of the way done with the project and all the sudden we run out of money? Would the project get stopped right there where it is?

And the other question is whenever you're doing the -- so the maps, like, marks on the map, do you do a couple miles at a time or five miles at a time as far as the levee goes? Is it broken up into pieces?

MR. INAMINE: So you saw a map that had 41 miles of levee that are targeted for construction. And so that is it. In other words, you have to complete, in order to achieve these goals, flood protection for the urbanized community from Yuba City north, it only works if you complete the whole thing. So our condition is to complete everything with state and local money from Thermalito down to Star Bend. So we're not going to stop until we get the whole system in. Because they're all interdependent water. And it doesn't really care where the funding stops or starts and where the project begins and ends. It's just to complete the project.

So now for contract administration purposes and in terms of prioritizing areas to create a risk, the project is broken up into phases. So the first phase is about 15 miles extending from Shanghai Bend to just north of Live Oak. That's the first phase. And the reason

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that's the first phase is because that's some of the lousiest levee in the system. That's also where the greatest number of people live, and that's where our first installment is.

So in terms of consequences of a levee breaking and in terms of hazard, that is one of the lousiest levees in the system. They all happen to be right there. So that's the first phase of construction that will take place in '13, '14.

And then the next phase of construction is this area from Live Oak all the way to Thermalito. They'll be another phase of construction just south of Yuba City. They'll be another phase of construction to address some specialty areas in between these areas where there's penetration things like railroads and bridges and so on. So it's phased in segments for the contract administration.

MR. ELLIOTT: We have this poster that is on the easel back there. It's also described in the environmental -- the phase that Mike described are color-coated in here. So the first phase is the one in green, and then the additional future phases are shown in blue, orange and purple. The first one right there --

There was another hand --

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UNIDENTIFIED MALE FROM AUDIENCE: I've got a different twist here. This will be more directed towards DWR. But as a family landowner inside the levee system, we were never paid when the Oroville Dam was built. I think the rights paid just -- but due to the clean water discharge, we as landowners have been -- our property run

PH1-E1

from (inaudible) Creek up to about -- I don't know -- a ways past Simple House Road on the east side. We've been absolutely devastated along our banks. And very honestly I certainly understand the advantages of getting the dam as high as possible, because we're way undersold down south in terms of water. And I certainly understand benefits of foreign levee. There's a tremendous amount of worth tech. But has any thought ever been given to do something for the landowners within the levee system?

MR. INAMINE: You mean on the water side of the levee? I don't represent DWR, so make of whatever I say what you will.

So I'm aware of those issues, and so you're referring to the bank erosion issues within the system?

UNIDENTIFIED MALE FROM AUDIENCE: Nothing has been done in terms of jail maintenance in terms of Feather

PH1-E2

River, whatsoever. I mean, we follow DWR over and over and over, and all we got is lip service.

MR. INAMINE: So DWR does have responsibility to

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channel. As to the -- I know the operation of Oroville Dam has been very controversial to not only landowners but tribes. And as part of the Central Valley plan, the DWR plan, they have -- Department of Water Resources has considered just those issues as part of the reservoir and operation. They're looking at reoperating reservoirs.

So some of the issues, like the gentleman in the back raised, about flood, including things like channel maintenance and operation, I don't know what the specific results of that are. That's a work in progress. There is an opportunity in that land-placing effort, that planning effort is still going on in the Feather River. And so we're going -- I say we -- a separate study that's being funded by the Department of Water Resources, both sides, both the east side and west side, have banded together to do what DWR would normally do, is to accept comments in just these kinds of issues for the Feather River region. So it's not a big dollar I have for this, but it is an effort to address local issues, projects like the ones you raised about the Feather River.

So we will be on a totally different venue, different project. This is a DWR record that has to be going through local agencies like ours. There'll be an opportunity to address those issues. We're not addressing them here. We're not DWR. We're just trying to fix the

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levees. But they'll be an opportunity to take those up in a more formal way in regional plans.

UNIDENTIFIED MALE FROM AUDIENCE: I know it's a terrible thing to say, but foreigner levee -- and that's very selfish to say, because obviously I live here in Gridley. And won't that -- we, as landowners, that's -- the best thing to happen is for the levee to break and take pressure off us. But that's not going to happen. And I understand.

PH1-E3

We went to DWR, they built Oroville Dam and that question was asked, "What about the rights?"

"We're not going to do that. We're going to litigate with that money. It's cheaper dollars down the road." That was DWR's own words. Reformation act document's in full. I mean, this has been an ongoing thing for a long time; 80 to 100 grand since Oroville Dam had been in business. And I realize, again, it's very beneficial, but it did not give us any protection whatsoever or the Sacramento land.

MR. INAMINE: So I can't speak to specific issues, but it would be important for you to get those comments into the record. So that it's documented and can be taken down.

MR. ELLIOTT: I believe there was another question.

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PH1-F1

RON ROMAN: You stated that projects are in phases. Are you going to, for instance, we're talking about possibility of bidding the first one out in February or later this year. Now, are you going to put other projects or other phases out to bid as a project is going, or are you going to wait until that one's completed and start the next phase and start the next phase?

MR. BESSETTE: So that's a good question. We're going to be bidding the first 15 miles around the Yuba City area; Shanghai Bend up to Live Oak, this year in March. So we plan to go out to bid on March 18th, open bids on April 19th, and award a contract this summer for that project. So that project will take two years to construct; 2013 and 2014.

The next project we're going to go out to bid early 2014 and that'll be for this area up north all the way up to Thermalito. So that will be bid in early 2014, award contracts and get into construction in spring/summer of 2014 and build that in two years of 2014 and 2015.

At the same time in 2014 probably towards the latter part of 2014, we'll issue another set of bid documents for what we call the gaps contracts. Filling in areas where Mike talked about, penetrations, railroad crossings and bridges, that'll be a special contract. So they'll be ongoing work throughout 2013, 2014 and 2015.

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RON ROMAN: With possibilities of overlapping the jobs and everything?

MR. BESSETTE: Exactly. Yes.

So we'll be very busy these next three years.

RON ROMAN: Thank you.

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EUGENE MASON, JR.: Your plan to discuss the slurry walls going down to lower levels to try to eliminate seepage and boils. I know I've discussed it and they're talking about going potentially 90 to 100 feet down. Agricultural wells in northern areas sit about 70 to 75 feet. Question comes in, has there been studies accomplished for groundwater recharge? And if so, what is the groundwater being looked at?

PH1-G1

If not, how will this affect a diminishing level of groundwater area and how will those effects crossover to the agricultural side where your report? Does it discuss that agriculture? Does it recharge an area as well?

So if you're going to take away water recharging from the river side, you're going to count on more coming from the agricultural irrigators. So it's kind of a long question, but it all surrounds around groundwater.

MR. BESSETTE: That's a good question. There was a study done -- original groundwater study done to see what existing conditions are and what the effect would be of building cutoff walls over most of the 41 miles of levee all the way through there. And you're right, a lot of the levees, a lot of the slurry walls go about 40 to 60 feet deep. There are a few areas where we have to go deeper. What's recognized is we need to get through the

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sand and gravel, as Chris was describing. So when they looked at the original effects, they found they were negligent. They were looking at general groundwater friends in the basin end to go north to south, down by the southern bypass, and actually some of the cutoff falls in the south were slightly raised groundwater levels.

But what I think you're describing is one of the wells, there also could be some very localized effects near the levee itself. A lot of the wells go deeper from what we've seen. If there were a shallow well very close to the levee, that would be something we'd want to take a look at. But from a regional standpoint, the shallow walls overall groundwater region in the basin itself. It's a document that was done in support of the environmental study.

I don't know if that answered your question.

EUGENE MASON JR.: It somewhat does. It's not overly assuring, because I know the studies somewhat. And in the written studies -- I'm not sure, but I don't have the data in front of me.

PH1-G2

MR. BESSETTE: Okay. And we can talk more a little bit after as well on some of the specifics.

MR. INAMINE: In realizing the alternatives considered, there was a no-action alternative. And all the other three alternatives were looking at a full 41

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miles of levees. And it's my understanding that a major impetus for this, beyond just basic human safety, is the violation of state code for having 200-year flood protection on urban areas; right?

EUGENE MASON JR.: That's correct.

MR. INAMINE: So was there any study to look at the minimum amount necessary of levee improvements to protect that to achieve that 200-year urban area project and then no more, essentially? Because I can't imagine that you need 41 miles to project Yuba City, right?

This has actually been looked at at the Corps feasibility study in a separate effort and the area plan that's referenced in the environmental document. So obviously there is public agency, there is an interest -- well, there's a charge to look at the most cost-effective solution for whatever objective is being achieved. And so for 200 level flood protection in two separate efforts, both in state area plan before we got money from the state, or agreement to get money from the state, the state said, "Well, show us that you're doing the most cost effective -- providing the most cost-effective solution." Agencies and the federal effort ask the same question. "What are the goals and how can you achieve this in the most cost-effective means?" And that often means minimal fix. So a variety of

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alternatives were looked at including both separate efforts, and they were very separate. Including ring levees around Yuba City, ring levees that were very short, just north and south of Yuba City. Little ring levees around Biggs and Gridley and portions of Live Oak. Just fixing short reaches of the Feather River to protect the most number of people. Unfortunately, there's short regions, like in the latest study, there was 32,000 people that were still at risk.

Berms were looked at as a least cost alternative. Unfortunately the effects on and in particular in an environment like this, it is very expensive and has huge impacts by taking so much land. The very controversial Cherokee Bypass was looked at as an alternative. We were taking Cherokee Canal -- probably read about this in the newspaper -- widening it by many thousands of feet and diverting water off the Feather River and the Butte Basin. And that was looked at and of course that was ridiculously expensive.

So we didn't just come up with a solution because it was easy. It just happens to be that in general it applies to a lot of structure fixing stuff in place and minimizing the effects, effective right-of-way take, just generally is the more cost effective solution.

We also looked at a number of setback plan

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levees. And we were required to look at them in the state study and federal study. So there were setbacks that were evaluated for the north part of the basin and in area of widening the hydraulic prism in this region and also south of Yuba City. It was very expensive. And, again, that's how we arrived at this levee repair scene of which essentially 85 percent of the work --

MR. ELLIOTT: But, in fact, if I'm recalling part of your original question, there are in fact reaches within this 41 miles for which no geotechnical measure is considered necessary to achieve the 200 protection. But those are relatively few. It is found that based on the level analysis that's been done, that the vast majority of each piece of the 41 miles has some deficiency relative to through-seepage or under-seepage criteria necessitating to achieve 200 year north of Yuba City and 100 year south.

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PH1-H1

JEFF FREDERICKS: Going off of the other gentleman's comment, I know in this area, north, we have quite a bit of extra freeboard. Why is there the need to replace all that dirt and bring the levee back up to the elevation it is now if we have -- I don't know -- eight feet of extra freeboard? Why do those levees need to be built back to the elevation they're at now?

MR. BESSETTE: As part of elevation process the Corps looks how you're going to alter that federal levee. And the least amount of work you need to do, the better off you are to get your permits through the Corps and Inter-Corps approval. So for us to alter the levee by lowering it, there would have to be that type of thing. If we're building it back to its existing gentry, and we're just strengthening the place, it's a much more benign type of project. We're not making a lot of changes to the federal project. So that's why. It was an easier way to get ourselves through that review in approval process. That's simply the answer.

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PH1-H2

DARLENE FREDERICKS: But is it the best way? I mean, it's the easiest way, but is it the best way?

MR. BESSETTE: It's the easiest way from a permitting standpoint, but from a construction standpoint, it's obviously a little more work. But at the end of the day, the community gets the protection it needs. So we're not looking to cut corners as part of this process.

MR. INAMINE: There's also one of the design goals is to keep the same level of protection. And even though these levees don't perform the way they should have to the top of the levee, is to ensure that they're not producing protection -- they're not reducing level of protection.

What's going to happen here in 10, 20 years is somebody else is going to do another hydrology study over Oroville Dam. And it may get reoperated. Global warming, all those, believe it or not, engineers are going to be changing hydrology and adjusting suffers. Hydrology is going to change, and there's going to be some study that's going to change when the water service elevation is and we're designing two today. So it's in our interest not to reduce the height of any of these levees. And in anticipation, the hydrology is going to change and probably go up. Generally every time somebody does a hydrology study it generally goes up a little bit.

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So in order to make sure this is a no-regress project, we're keeping everything the same. We're not adding anything. We're not taking anything away. Everybody will get the same level of protection they had, and the least level of protection they had will be prism and not dropping it. And when that study comes through again in ten years or whenever when water comes up, it doesn't really cost us anything to restore anything in place or restore the original prism. And it does make the living easier, but the primary reason is to make sure it's a no-regress project.

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PH1-I1

SANDRA WALLER: How is this project going to deal with high pipelines through the levee?

MR. BESSETTE: She asked how is this project going to deal with pipelines through the levee.

The existing pipelines will be adjusted to conform to current design standards. So if they don't conform, the project is going to realign those pipelines. If the pipelines are not being utilized anymore, we'll remove the pipeline. We're working with all of the owners of those pipelines to relocate and readjust them to conform to current standards.

Let's take down your information.

PH1-I2

SANDRA WALLER: Any ways, they're there. They're permitted. They were amended when the levee was constructed. My question is, who is doing slurry? What do you do? We use them.

MR. BESSETTE: Right. Well, we would have to temporarily relocate them, keep them -- the irrigation lines, they would have to be kept in service in some manner. And we would do temporary facilities. And then the permanent facility would be adjusted to standard. They'll be dealt with as part of a project. It depends on what the language of the permits say. If they're permitted, and depending on language of what the permit says, it will depend on who pays for the rehabilitation.

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If there were pre -- before the levee, so they would probably be a project box. It would only be if the language within the permit says that the owner of that facility has to be relocated as part of relocation flood project, then that person would have to pay for it.

But we researched all the facilities that we know about. We pulled all the permits and we have the language, so maybe I can get your information and we can give you that information about your facility.

SANDRA WALLER: Well, there were no permits on those because it was court ordered. It went through the court system that those had to be put there.

PH1-I3

MR. BESSETTE: Then most likely the project would pay for those.

SANDRA WALLER: I think Steve Landberg probably has it.

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JUSTIN KELLY: Justin Kelly, farmer in Live Oak.

When will -- on the acquisition side -- when will

PH1-J1

they be presented to landowners along the levee? I know some landowners have received acquisition proposals and others haven't.

MR. BESSETTE: Barry is part of our team and he's the one coordinating with our engineering team, and he's taking the leads on that effort.

MR. O'REGAN: So we're dealing with -- so we're focusing in the Yuba City, Live Oak area currently and moving north. And for the project area plans we talked about earlier, we would expect to make all those in the spring, pay all that, and then project D, which is Gridley area and Biggs, we would begin that process. And that's going to extend into the summer. So we're working through getting those as we move forward.

JUSTIN KELLY: So will there be a legal -- what

PH1-J2

would be the natural recourse if we did not like that proposal presented to us?

MR. O'REGAN: So what we would do is it's a long process. We would go in the field and show you how the project needs to be constructed and how we could operate the project. The project is built, and they know we raise property and we negotiate with you. And on what is required in the operation of the project.

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PH1-J3

JUSTIN KELLY: And am I correct in understanding that in this book you have parcel by parcel of what the project will appear to be like on completion? So for those who have not seen any of the projects and how they affect our land, they're present in that book up there?

MR. O'REGAN: No, but I have that description.

JUSTIN KELLY: I appreciate that. Thank you.

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PH1-K1

JEFF HUGHES: When are you going to address what happened to the land and river down there in South Sutter County? The one that is the U.S. Fish and Game Service or the California one? All it is is blackberry vines, gold trees, brush and sandbars.

MR. ELLIOTT: So the question is about the material that's in the channel part of it by Fish and Game and whether that represents constriction of and how that constriction influences the deficiencies that we see in the levees and flood rights.

So how can we best answer that question? And knowing the prior conversation, the question specifically is what might that influence be and what we need to do today?

MR. INAMINE: So at that location there's a big slug of seven -- in the river hydraulic gets back times. It's hydraulic. So we've looked at that through our consultation, and the thing about just simply dredging all of that material out of the river is that doesn't change what we have to do for the levees. We're not going to be able to just take all that material out and the water elevation drops. It's a little more complicated than that. The water service elevation is going to come up to the top, and what happens downstream of that location, the other issue with removing that kind of sediment is so a

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big slug of hydraulic mining that's coming down from the system, and what's happened in past events, you get a high water event. And they dredge that part of the system, and it goes up, and you're left with the same elevation. You need to mediate the levees. So the problem is engineers at those lower locations, you still have to fix the levee to withstand certain water surface elevation regardless of what happens in the channel.

There's another group that's called Lower Feather River Corridor Management Program, and they're looking at that. At what you're describing, removing dredging material, but as far as this project is concerned, we've looked at that and it doesn't make any difference with respect to geotechnical issues. You still got to fix the levees. The water is still going to come up on the levee, and you still have to provide an awful lot of amount of strength to keep the water on the right side of the levee.

MR. ELLIOTT: Chris, if I can turn to you, I've heard the engineers -- Mike addressed it very well -- in terms of hydrology aspects and by dropping the invert of the river. It doesn't have that corresponding effect water service, but also I've heard the concept described essentially by dredging could be making under-seepage worse by shortening the seepage fact.

Perhaps you can talk about that a little bit?

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MR. KRIVANEC: Yeah. As Chris said earlier, the cross section of the levee, it's this is showing a very deep part of the river here. But with this phenomenon under-seepage through here, a lot of time main channel is further away from levee, and sands and gravel and underneath. But sometimes when you're dredging, what you're referring to is you're taking some of that material away that the water pressure has to pass through. So you're actually opening it up more to come up the levee.

Now, some of the dredging is going to be further away from the levee. But in areas, if you start moving some of the clay blanket and exposing more gravels, it's going to go under more velocity, more pressure coming up the levee.

MR. ELLIOTT: Probably about the time where we can wrap up the audiotape of the general conference.

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PH1-L1

UNIDENTIFIED MALE FROM AUDIENCE: It's a general topic. I just wanted to mention that it might be there, but it wasn't immediately obvious on the Sutter Flood Control Web site where you can submit an electronic comment on the Web site itself. And it'd be nice if that was at least made obvious to be put in place if it's not already. So people not intending to comment here can do that.

MR. ELLIOTT: Thank you. We'll look into that.

Okay. With this, I think we'll close the general question and comments. We will be here as long as we need to to address some additional questions and comments. So we invite you to come up to us.

(Thereupon the meeting adjourned at 7:46 p.m.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss
COUNTY OF SACRAMENTO)

I, JILLIAN M. BASSETT, a Certified Shorthand Reporter, licensed by the state of California and empowered to administer oaths and affirmations pursuant to Section 2093 (b) of the Code of Civil Procedure, do hereby certify:

The said proceedings were recorded stenographically by me and were thereafter transcribed under my direction via computer-assisted transcription;

That the foregoing transcript is a true record of the proceedings which then and there took place;

That I am a disinterested person to said action.

IN WITNESS WHEREOF, I have subscribed my name on February 1, 2013.

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JILLIAN M. BASSETT
Certified Shorthand Reporter No. 13619

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Response to PH1-A, Sam Alexander

PH1-A1

So in 1997, and I can only speak for my personal experience, there was a high-water stake that was done by a variety of groups, high-water staking. And so the high water staking was done in 1997. And to be fair, the staking was done—it wasn't consistent throughout the river system. But that was used to collaborate models—computer models that were used to describe what levees need to be following the accident and why they need to be fixed and what type of fixes we were going to put into them.

So there was high-water stake. And I personally saw some stake that was done, and it was not real consistent. Now, in your area, we can talk about that. That was one of those areas that did not get wet, which was significant about high-water staking is depending on where you were during the system, which is a 150-year event, just depends on how much water was coming. [See chapter 3.1, Section 3.2.1.1: Sacramento River Flood Control Project Levee Height Requirements; Section 3.1.2.2: Levee Deficiency Evaluation] Comment did not necessitate change to the Final EIS.

PH1-A2

So we have the levee and the canal going through. And so it goes deeper than the levee itself. And in fact, I think the canal levee, when we analyze it, like Mike was saying before; we're using a 100-year event. We're looking at it and a certain procedure, USACE, to look at under-seepage underneath the levee. And part is there's an opening. And I think, as you know, that canal is dry February or March. It's about eight-feet deep. [See Chapter 3.1, Sections 3.1.2.1; 3.1.2.2: Channel Capacity, Levee Dimensions, and Site-Specific Flood and Discharge Information; Under-Seepage; Potential Levee Failure Mechanisms] Comment did not necessitate change to the Final EIS.

PH1-A3

For that exact reason. If there were a flood event in February or March and the canal is dry, that is the condition we want. And that's actually the time of year it could occur. [See Chapter 1, Section 1.3.2; Chapter 3.1, Sections 3.1.2.1; 3.1.2.2: Channel Capacity, Levee Dimensions, and Site-Specific Flood and Discharge Information; Potential Levee Failure Mechanisms] Comment did not necessitate change to the Final EIS.

PH1-A4

We've talked about that. And we talked a bit more about it as canal operators. It's a possible option, and we're still working through design features. But what they did when they built the canal, is water pressure was coming underneath the levee and there was pressure going up against. When they build the canal, the blanket got very thin and kind of created a worsening condition. [See Chapter 2, Section 2.6.2.2] Comment did not necessitate change to the Final EIS.

PH1-A5

And that's another thing we're considering with the other levee there. What if the river levee breaches into the canal? What happens? And with that consideration, it's one of the areas of lower risk. So we're still looking at that and working with USACE. How you consider that's the project levee of flood control and you do have bank on either side, how does that whole system work? And we're

still evaluating that. I know that doesn't completely answer your question, but that's— [See Chapter 2, Section 2.6.2.2] Comment did not necessitate change to the Final EIS.

PH1-A6

There have been other areas where there have been serious flood s where the canal has been dry and flood was up. So it's still a very big concern. [See Chapter 2, Section 2.6.2.2] Comment did not necessitate change to the Final EIS.

Response to PH1-B, Dan Cole

PH1-B1

You're absolutely right. That's a large part of what the Oroville project was about, which was financed by the State Water Project, State Water Contractors. But there's 750,000 feet of storage in Oroville Dam for the purposes of flood control. So when water hits reservoir, big peeks of high volumes flow that normally come down through the system are continuant and stored in the reservoir and released gradually—not release d gradually enough, like in 1997, and on other occasions. But there's always a trade-off, just as you're pointing out. I would take maybe a biased approach to this, but there's always a trade-off for water and water supply and keeping enough empty space for the wet part of the season in order segue the floods. If you look at the flows down the river, pre-Oroville and post-Oroville, there's a big difference. I mean, it has greatly reduced risk downstream and is an example of that everywhere else in the system in Central Valley. Virtually everywhere levees got to be raised or forged, or channel capacity has to be—we're fortunate because Oroville, we don't have to raise levees because these levees were essentially overbuilt. They're higher than they need to be because they were constructed pre-Oroville. So while in a perfect world if Oroville was being operated strictly for flood control, you might get more benefit out of it if it was paid for essentially by State Board Contractors. A lot of that flood benefit is provided by all of us or at least we reap the benefits in stages. Comment did not necessitate change to the Final EIS.

PH1-B2

There's a lot of folks who would like to have Southern California pay for that. That is probably more of a political solution about how the system is set up. I can only speak to the way this system was constructed way back and was turned over to the federal government and the USACE as the authorized system. It was never part of the flood—the state water project system that it is now is part of it. Comment did not necessitate change to the Final EIS.

Response to PH1-C, Mr. Romando

PH1-C1

Well, roughly, the project was about 300 million, and 75% was from the state—throughout the state. Comment did not necessitate change to the Final EIS.

PH1-C2

Assessment. Comment did not necessitate change to the Final EIS.

PH1-C3

This is funded, the money to pay the state, our 75%, is all bond money. And there's just so much money available for this type of project. And it's budgeted and authorized through the state budget process. So when it's gone, it's gone. The assessment money that leverages that later amount to a certain extent, that's a pretty tight budget, too. It is tough getting assessment passed. There's not a lot of local money used. So as far as we're concerned, that's it. That's the money we have allotted to do this project. That's what we're going to stay within that budget. Now, there's another federal interest in the region, and Chris described it earlier. And that is the federal feasibility study. So this 408 project that we're talking about here, this is all state, local money. This is a local project that we're going to build in advance to the USACE. But the state doesn't just say," Here's 200 million. Go do good things with it. They say, "We want to make sure you guys stay coordinated with this other USACE feasibility study. Make sure you do something that the USACE will likely build so that if you build something that looks a lot like the federal project, in five or ten years, that we get credit for it. "We" as in the state gets credit for it. That does two things; it leverages more bond money so we can spend it on other projects, other projects within the basin. But it's also a good back up plan. Most of you may be aware of what's happening down south. SAFCA, just as you described, got a local assessment, 75% funding from the state of California. But they didn't complete the ring around Natomas. So the backup plan was to have the USACE, because they had the federal study that was completed back up plan, was to have USACE finish the job. It is not our intention to do that, obviously, here. And we have more strict—we have more difficult financial issues to address here. We're not like the welder communities in Sacramento. But that's still a pretty viable back up plan is to have two things going on; state local funding to do it ourselves here for our project, and if for whatever reason something goes awry, then we have a federal project to support completing the job. [See Chapter 1, Section 1.5] Comment did not necessitate change to the Final EIS.

Response to PH1-D, Kathy Hodges

PH1-D1

You saw a map that had 41 miles of levee that are targeted for construction. And so that is it. In other words, you have to complete, in order to achieve these goals, flood protection for the urbanized community from Yuba City north, it only works if you complete the whole thing. So our condition is to complete everything with state local money from Thermalito down to Star Bend. So we're not going to stop until we get the whole system in. Because they're all interdependent water. And it doesn't really care where the funding stops or starts and where the project begins and ends. It's just to complete the project.

So now for contract administration purposes and in terms of prioritizing areas to create a risk, the project is broken up into phases. The first phase is about 15 miles extending from Shanghai Bend to just north of Live Oak. That's the first phase. The reason that's the first phase is because that's some of the lousiest levee in the system. That's also where the greatest number of people live, and that's where our first installment is.

So, in terms of consequences of a levee breaking and in terms of hazard, that is one of the lousiest levees in the system. They all happen to be right there. So that's the first phase of construction that will take place in 2013/2014. The next phase of construction is this area from Live Oak all the way to Thermalito. There will be another phase of construction just south of Yuba City. There will be another phase of construction to address some specialty areas in between these areas where there

are penetration things like railroads and bridges and so on. So it's phased in segments for the contract administration. [See Chapter 2, Section 2.2.3] Comment did not necessitate change to the Final EIS.

Response to PH1-E, Unidentified Male

PH1-E1

You mean on the water side of the levee? I don't represent the California Department of Water Resources (DWR), so make of whatever I say what you will. I'm aware of those issues, and you're referring to the bank erosion issues within the system? Comment did not necessitate change to the Final EIS.

PH1-E2

DWR does have responsibility to channel. The operation of Oroville Dam has been very controversial to not only landowners but tribes. And as part of the Central Valley plan, the DWR plan, they have considered just those issues as part of the reservoir and operation. They're looking at re-operating reservoirs. [See Chapter 2, Section 2.7.2.2]

So some of the issues, like the gentleman in the back raised, about flood, including things like channel maintenance and operation, I don't know what the specific results of that are. That's a work in progress. There is an opportunity in that land-placing effort, that planning effort is still going on in the Feather River. A separate study that's being funded by DWR, both sides, both the east side and west side, have banded together to do what DWR would normally do—accept comments on just these kinds of issues for the Feather River region. So it's not a big dollar I have for this, but it is an effort to address local issues, projects like the ones you raised about the Feather River.

So we will be on a totally different venue, different project. This is a DWR record that has to be going through local agencies like ours. There will be an opportunity to address those issues. We're not addressing them here. We're not DWR. We're just trying to fix the levees. But there will be an opportunity to take those up in a more formal way in regional plans. Comment did not necessitate change to the Final EIS.

PH1-E3

I can't speak to specific issues, but it would be important for you to get those comments into the record. So that it's documented and can be taken down. [See Chapter 2, Section 2.3.1] Comment did not necessitate change to the Final EIS.

Response to PH1-F, Ron Roman

PH1-F1

We're going to be bidding the first 15 miles around the Yuba City area; Shanghai Bend up to Live Oak, this year in March. So we plan to go out to bid on March 18th, open bids on April 19th, and award a contract this summer for that project. So that project will take two years to construct—2013 and 2014.

The next project we're going to go out to bid early 2014 and that'll be for this area up north all the way up to Thermalito. So that will be bid in early 2014, award contracts and get into construction in spring/summer of 2014 and build that in 2014 and 2015.

At the same time in 2014 probably towards the latter part of 2014, we'll issue another set of bid documents for what we call the gaps contracts. Filling in areas where Mike talked about, penetrations, railroad crossings and bridges, that'll be a special contract. So they'll be ongoing work throughout 2013, 2014 and 2015. [See Chapter 2, Section 2.2.3] Comment did not necessitate change to the Final EIS.

Response to PH1-G, Eugene Mason, Jr.

PH1-G1

There was a study done—original groundwater study done to see what existing conditions are and what the effect would be of building cut off walls over most of the 41 miles of levee all the way through there. And you're right, a lot of the levees, a lot of the slurry walls go about 40 to 60 feet deep. There are a few area s where we have to go deeper. What's recognized is we need to get through the sand and gravel. So when they looked at the original effects, they found they were negligent. They were looking at general groundwater friends ["trends"?] in the basin end to go north to south, down by the southern bypass, and actually some of the cut off falls in the south were slightly raised groundwater levels.

But what I think you're describing is one of the wells, there also could be some very localized effects near the levee itself. A lot of the wells go deeper from what we've seen. If there were a shallow well very close to the levee, that would be something we'd want to take a look at. But from a regional standpoint, the shallow wells overall groundwater region in the basin itself. It's a document that was done in support of the environmental study. [See Chapter 2, Section 2.5.7.3; Chapter 3.2, Section 3.2.2.2: Groundwater Quantity and Quality] Comment did not necessitate change to the Final EIS.

PH1-G2

So was there any study to look at the minimum amount necessary of levee improvements to protect that to achieve that 200-year urban area project and then no more, essentially? Because I can't imagine that you need 41 miles to project Yuba City, right?

This has actually been looked at in the USACE feasibility study in a separate effort and the area plan that's referenced in the environmental document. So obviously there is public agency, there is an interest—well, there's a charge to look at the most cost- effective solution for whatever objective is being achieved. And so for 200 level flood protect ion in two separate efforts, both in state area plan before we got money from the state, or agreement to get money from the state, the state said, "Well, show us that you're doing the most cost effective—providing the most cost-effective solution. "Gold agencies and the federal effort ask the same question. "What are the goals and how can you achieve this in the most cost- effective means?" And that often means minimal fix. So a variety of alternatives were looked at including both separate efforts, and they were very separate. Including ring levees around Yuba City, wing levees that were very short, just north and south of Yuba City. Little ring levees around Biggs and Gridley and portions of Live Oak. Just fixing short reaches of the Feather River to protect the most number of people. Unfortunately, there's short regions, like in the latest study, there were 32, 000 people that were still at risk.

Berms were looked at as a least cost alternative. Unfortunately the effects on and particular in an environment like this it is very expensive and has huge impacts by taking so much land. The very controversial Cherokee Bypass was looked at as an alternative. We were taking Cherokee Canal—probably read about this in the newspaper—widening it by many thousands of feet and diverting water off the Feather River and the Butte Basin. And that was looked at and of course that was ridiculously expensive.

So we didn't just come up with a solution because it was easy. It just happens to be that in general it applies to a lot of structure fixing stuff in place and minimizing the effects, effective right-of-way take, just generally is the more cost effective solution.

We also looked at a number of setback plan levees. And we were required to look at them in the state study and federal study. So there were setbacks that were evaluated for the north part of the basin and in area of widening the hydraulic prism in this region and also south of Yuba City. It was very expensive. And, again, that's how we arrived at this levee repair scene of which essentially 85% of the work— [See Chapter 2, Section 2.7; Chapter 3, Section 3.1.2; Section 3.1.2.2] Comment did not necessitate change to the Final EIS.

Response to PH1-H1, Jeff Fredericks

PH1-H1

As part of elevation process the USACE looks how you're going to alter that federal levee. And the least amount of work you need to do, the better off you are to get your permits through the USACE and inter-USACE approval. So for us to alter the levee by lowering it there would have to be that type of thing. If we're building it back to its existing gentry, and we're just strengthening the place, it's a much more benign type of project. We're not making a lot of changes to the federal project. So that's why. It was an easier way to get ourselves through that review in approval process. [See Chapter 1, Sections 1.4, 1.5] Comment did not necessitate change to the Final EIS.

Response to PH1-H2, Darlene Fredericks

PH1-H2

It's the easiest way from a permitting standpoint, but from a construction standpoint, it's obviously a little more work. But at the end of the day, the community gets the protection it needs. So we're not looking to cut corners as part of this process.

There's also one of the design goals is to keep the same level of protection. And even though these levees don't perform the way they should have to the top of the levee, is to ensure that they're not producing protection—they're not reducing level of protection.

What's going to happen here in 10, 20 years is somebody else is going to do another hydrology study over Oroville Dam. And it may get re-operated. Global warming, believe it or not, all those engineers are going to be changing hydrology and adjusting suffers. Hydrology is going to change, and there's going to be some study that's going to change when the water service elevation is and we're designing two today. So it's in our interest not to reduce the height of any of these levees. And in anticipation, the hydrology is going to change and probably go up. Generally every time somebody does a hydrology study it generally goes up a little bit. So in order to make sure this is a no-regress project, we're keeping everything the same. We're not adding anything. We're not taking anything

away. Everybody will get the same level of protection they had, and the least level of protection they had will be prism and not dropping it. And when that study comes through again in ten years or whenever when water comes up, it doesn't really cost us anything to restore anything in place or restore the original prism. And it does make the living easier, but the primary reason is to make sure it's a no-regress project. [See Chapter 1, Section 1.4] Comment did not necessitate change to the Final EIS.

Response to PH1-I, Sandra Waller

PH1-I1

The existing pipelines will be adjusted to conform to current design standards. So if they don't conform, the project is going to re align those pipelines. If the pipelines are not being utilized anymore, we'll remove the pipeline. We're working with all of the owners of those pipelines to relocate and readjust them to conform to current standards. [See Chapter 2, Section 2.3.2 and Table 2-5] Comment did not necessitate change to the Final EIS.

PH1-I2

We would have to temporarily relocate them, keep them—the irrigation line—they would have to be kept in service in some manner. And we would do temporary facilities. And then the permanent facility would be adjusted to standard. They'll be dealt with as part of a project. It depends on what the language of the permits say. If they're permitted, and depending on language of what the permits say, it will depend on who pays for the rehabilitation. But we researched all the facilities that we know about. We pulled all the permits and we have the language, so maybe I can get your information and we can give you that information about your facility. [See Chapter 2, Section 2.3.2 and Table 2-5] Comment did not necessitate change to the Final EIS.

PH1-I3

Then most likely the project would pay for those. Comment did not necessitate change to the Final EIS.

Response to PH1-J, Justin Kelly

PH1-J1

We're focusing in the Yuba City, Live Oak area currently and moving north. And for the project area plans we talked about earlier, we would expect to make all those in the spring, pay all that, and then project D, which is Gridley area and Biggs, we would begin that process. And that's going to extend into the summer. So we're working through getting those as we move forward. Comment did not necessitate change to the Final EIS.

PH1-J2

So what we would do is it's a long process. We would go in the field and show you how the project needs to be constructed and how we could operate the project. The project is built, and they know we raise property and we negotiate with you. And on what is required in the operation of the project. Comment did not necessitate change to the Final EIS.

PH1-J3

No, but I have that description. [See Chapter 2, Section 2.2.3, Table 2-4] Comment did not necessitate change to the Final EIS.

Response to PH1-K, Jeff Hughes

PH1-K1

At that location there's a big slug of seven—in the river hydraulic gets back times. It's hydraulic. So we've looked at that through our consul, and the thing about just simply dredging all of that material out of the river is that doesn't change what we have to do for the levees. We're not going to be able to just take all that material out and the water elevation drops. It's a little more complicated than that. The water service elevation is going to come up to the top, and what happens downstream of that location, the other issue with removing that kind of sediment is so a big slug of hydraulic mining that's coming down from the system, and what's happened in past events, you get a high water event. And they dredge that part of the system, and it goes up, and you're left with the same elevation. You need to mediate the levees. So the problem is engineers at those lower locations, you still have to fix the levee to withstand certain water surface elevation regardless of what happens in the channel.

There's another group that's called Lower Feather River Corridor Management Program, and they're looking at that. At what you're describing, removing dredging material, but as far as this project is concerned, we've looked at that and it doesn't make any difference with respect to geotechnical issues. You've still got to fix the levees. The water is still going to come up on the levee, and you still have to provide an awful lot of strength to keep the water on the right side of the levee.

The cross section of the levee, it's showing a very deep part of the river here. But with this phenomenon under - seepage through here, a lot of time main channel is further away from levee, and sands and gravel and underneath. But sometimes when you're dredging, what you're referring to is you're taking some of that material away that the water pressure has to pass through. So you're actually opening it up more to come up the levee. Now, some of the dredging is going to be further away from the levee. But in areas, if you start moving some of the clay blanket and exposing more gravels, it's going to go under more velocity, more pressure coming up the levee. Comment did not necessitate change to the Final EIS.

Response to PH1-L, Unidentified Male

PH1-L1

Thank you. We'll look into that. To clarify, SBFCA's web site (www.sutterbutteflood.org) had posted the scoping and public hearing materials with the relevant contact information for commenting on the Draft EIS/EIR although no mechanism was established to comment directly from the project web site. Comment did not necessitate change to the Final EIS.

Public Hearing 2, January 16, 2013, 3:00 p.m.

Public Hearing
PH2, 3:00pm

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Feather River West Levee Project

Public Meeting

Wednesday, January 16th, 2013

Yuba City Veterans Memorial Community Building

1425 Veterans Memorial Circle

Yuba City, California

3:00 p.m.

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Reported By: Jillian M. Bassett, CSR No. 13619

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I N D E X

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PRESENTATION

Good evening, everyone. Thank you for coming this evening. It's been some time since we had our last presentation, so we'll go ahead and get started.

So this is one of three public meetings that is being done for the Feather River West Levee Project that is specific to the Environmental Documentation Process. And that is the National Environmental Policy Act and California Environmental Policy Act process.

There is an environmental impact statement and environmental impact report which are done as a joint document under civil cover that was published at the end of December and is out for review period right now. And that's what we are precisely here to do this afternoon is to explain the contents of that document in terms of project goals and objectives, what the project alternatives are, and the effects of those alternatives and how the public is invited. And we desire to have the feedback into that process and have the most complete and accurate picture that we can to help the Sutter Butte Flood Control Agency in ultimately making a decision to adopt a project, and all of the other state and federal agencies who also have some authority or permission for the project.

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So we have about close to a half-hour presentation. And then what we're going to do is take questions and answers and comments as a group. However, if the questions become very specific, then what we will probably do is save those questions for a more one-on-one conversation so that we can look at things on more of an individual basis that way and provide a more tailored response.

So with that, what I'll do is introduce myself and the other members of the team who are there to help the conversation this afternoon.

So I am Chris Elliott, I am from ICF International. We are a consult firm. My office is in Sacramento. We also have another office here in the valley in Redding. And we are assisting Sutter Butte Flood Control Agency and U.S. Army Corps of Engineers in preparing the environmental document.

Other members of the team, in the back to my right is Mike Inamine. And he is the Executive Director of Sutter Butte Flood Control Agency.

And in the back to my left is Michael Bessette. And Michael is Director of Engineering of the Sutter Butte Flood Control Agency. And they are the two full-time, permanent, professional staff of the Flood Control Agency.

So in addition, over here to my right we have

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Barry O'regan. And Barry is overseeing the environmental process as well as the real estate process that's associated with the project.

Standing next to Barry is Kim Floyd. Many of you probably know Kim. Kim was instrumental in the outreach efforts that were associated with establishing the Assessment District. It's those assessment dollars that are in large part paying for the improvements to the levees that we're going to talk about today.

And let's continue down to the back with Michelle Osborn who helped you sign in. And please, if you did not sign in at the beginning of the meeting, it's very important we have your name and address if you are interested in staying on the mailing list and seeing additional correspondence about this process.

And also in the back is Ingrid, who is assisting overall this evening.

And then moving up here to the front of the room is Jillian, who is our court reporter. And she is going to be recording this meeting in its entirety. So all of the comments and questions that are asked in our group discussion, she'll be recording. They will be published as part of the final environmental document. And also Jillian is here if you do not wish to submit a written public comment, then you can sit down privately with

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Jillian and she can take your comments down. And there will be a formal response therefore that is then provided within that final document that is published.

So other folks who are here with us this evening, and we talked about Sutter Butte Flood Control side of things, but there's also the U.S. Army Corps of Engineers. They are the federal lead on the National Environmental Policy Act side of the document. And the Corps has a very important role in terms of two permissions that must be granted for the project to be constructed. And specifically that's associated with Rivers and Harbors Act and something called Section 408, which is ensuring integrity of Sacramento Flood Control Project. Which the levees along the Feather River are a part of. So there needs to be permission from the Corps of Engineers to allow modification. And also the Corps has authority through the Clean Water Act and looking at what are known as waters of the United States. And that those are not adversely affected.

So representing the Corps we have Adam Riley who is in the back there waving his hand. Adam is the Corp's Project Manager for the Feather River West Levee Project. And specifically has oversight of that 408 process.

Also with Adam from the Corps, we have Laura Whitney who is seated right here who is the project

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manager.

There is a companion study that is the feasibility study for the Sutter Basin -- the Sutter Basin Project. And many of you might be familiar with that as well. In fact, in this room in June of 2011, we held public scoping meetings which were joint meetings discussing both the Feather River West Levee Project and Sutter Basin Feasibility Study.

Here our focus is to take specific comments on the Feather River West Levee Project. But if you do have any questions or comments about the Sutter Basin Feasibility Study, we have Laura and other members of her team to talk about that if you do have questions.

Other members of that team include Matt Davis. And Matt is the environmental lead for the feasibility study. And we have Joe Griffin who is an archeologist with the Corps of Engineers.

And next to him is Jeff Koschak. And Jeff is the environmental lead for the Feather River West Levee Project. So essentially Matt counterparts, one of the them serving the feasibility study, the other serving the Feather River West Levee Project. Both of them working in close coordination because of the type association between the resources, the planning area, etc., between those two companion efforts.

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So about the presentation --

MR. INAMINE: I wanted to make a few more introductions of the board members.

MR. ELLIOTT: Please do, Mike.

MR. INAMINE: First of all I want to introduce Jim Whiteaker, who is Sutter County Corps of Supervisors President. Then I report to a board of 13 members of the Sutter Butte Flood Control Agency, the Board of Directors beginning with Jim Gallagher here in the front. John Dukes, Stan Clayton, Francis Silva is around here. And I think that was it.

MR. ELLIOTT: So we do have some materials here that are aids to our conversation. Some of you may have found out about this meeting through this mailer that came out. We have additional copies of this here that provide a basic overview of the activities that the Flood Control Agency is engaged in right now, and specifically about the environmental document. There is this agenda which is part of the formal notice about the meeting. And very importantly, this is a comment card.

So if you choose to submit written comments on the document, which will be formally responded to and included within the final environmental impact statement and environmental impact report, this is one way to do that. Another way to submit comments, again, is to speak

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directly with Jillian, and she'll take your comments. And they can also be submitted by e-mail. And we have information that's in the copy -- we have hard copies of power point presentation that we're going through towards the back. The complete contact information for Ingrid Norgaard and Jeff Koschak is listed there. Two individuals you can submit comments to. And also on the comment board, hand written in red there if you can see it, that is an e-mail address you can send comments to.

So all those mechanisms are -- will get the comments to the same place and they will be formally responded to and published in the document.

So in terms of the presentation; four basic parts. First, we're going to talk a little bit about the project background, and then we're going to go into a little bit more of the history and context of how we got to this point in terms of state of the levees, and then we'll discuss this project. We're going to take a closer look at the project in particular in terms of what the measures are that are proposed and how those measures are formulated into different alternatives that are evaluated in the environmental document. And then we'll talk lastly about the environmental document itself.

So first, about the project background -- the Sutter Butte Flood Control Agency, again, is the CEQA lead

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agency and is the proponent of the project and the agency that will both ultimately adopt the project to advance toward construction.

Sutter Butte Flood Control Agency is what is known as the joint powers authority. And that is essentially where a number of different public agency interests come together and work collaterally as a single agency. So the number of agencies that comprise the Sutter Butte Flood Control Agency are Levee Districts 1 and 9, as well as the counties of Butte and Sutter, as well as the cities in the area; Yuba City, Gridley, Biggs Live Oak. Those are the member agencies of the Sutter Butte Flood Control Agency.

So the efforts that are understudy in the document and what the agency has been engaged in are funded by the Assessment District that the citizens of the county passed. And so that's where the money comes from for the study. And then ultimately will be put towards construction through that Assessment District. So the purpose of this project that Sutter Butte Flood Control Agency has understudy at this time is to look at the 41 miles along the west bank of the Feather River from Thermalito Afterbay upstream at the very north of the project, 41 miles down to, not quite reaching the confluence of the Sutter Bypass. So stopping about three

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or four miles short of that point.

So we'll talk a little bit more about the specific things that need to be treated on that part of the levee.

So the construction is target to begin 2013. The project that is 41 miles long and cannot be built in a single construction season. So it will last for the successive years after that, probably a three or four year project to build. And Sutter Butte Flood Control Agency, again, is coordinating directly with the state of California. State of California administers part of the funds for the project through propositions 84 and 1E. The voters of California passed those propositions, which resulted in bonds that have provided for hundreds of millions of dollars for the infrastructure improvements like this project across the state that goes in combination with the local maps provided by the Assessment District.

The state of California also has a role through the Central Valley Flood Protection Board. The Central Valley Flood Protection Board has delegated authority of the responsibility of the Sacramento River Flood Control Project. And Sutter Butte Flood Control Agency will be asking its permission of the Corps of Engineers to modify the levees through the Central Valley Flood Protection

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Board.

So how did we get here? A little bit of the history. So prior to the European Settlement of Sacramento Valley that occurred after the Gold Rush from 1849-1850, what we saw is when we had a seasonal snow melt coming down from the Sierra as well as rains in the valley, winter, springtime, that contributes for the Sacramento and Feather River frequently leaving the banks, the Central Valley was mostly a mosaic of different land cover types that were seasonally inundated. So there could be frail wetlands, seasonal wetlands, upland areas, grasslands, oak savanna.

What happened after settlement and during that same time, one of the methods that was used to distract the gold, which was highly efficient for being able to loosen the gold from the rocks and soil that it was held in was hydraulic mining. And what that did was it washed away literally millions of cubic yards of material down the Bear and the Feather and the American, and all of those tributaries that flow into the Sacramento Valley.

One thing that that had very real effect on was the lives of those who were living here in the valley. Meaning that the rivers no longer had that same channel capacity. And so the frequency with which they could overtop their banks was exacerbated by the hydraulic

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mining area. So what we started to see was individual landowners who would then construct levees on their property either to protect the property, and then as landowners band together to increase the levee system that was using the hydraulic force of the water itself -- so the river itself, to blast that sediment down to the Delta and ultimately down to the San Francisco Bay.

Over time that levee system continued to be built serving the purposes of flood management, navigation, as well as providing for diversions for water supply. Ultimately it's those individual private levees, which were then studied by the federal government and grandfathered into the Sacramento River Flood Control Project in the early 1900s.

So what's happened over the last century, as we too frequently have reminders of, is that we have a very fragile flood management system. Those levees that were built by individual landowners, they were typically made of whatever materials were most readily handed at the time. So that could have been dredged materials directly from the river; it could have been scraping material from the adjacent farmlands. But sometimes that material wasn't always the standard to which you would want your levees to be built. A lot of alluvial soils, sandy, coarse materials that aren't very cohesive and do not meet

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the specifications of what we need today as acceptable flood material and providing flood management that we desire.

1955 was a stark reminder of this. More than 38 people were killed from a break at Shanghai Bend. After that the state of California constructed the dam of the reservoir at Oroville, which provided some flood continuation and some flood management on the Feather System. And then on, later than that, New Bullards Bar was created providing additional storage, and was another opportunity for flood management. But even despite construction in those levees and building of that upstream storage to continuate those peak flows, floods still occur and is part of the valley, unfortunately.

1986, 1987 were both years that saw tragic events in terms of tens of thousands of acres that were flooded, businesses that were damaged, lives that were lost. And it's precisely those circumstances that we are hoping to avoid again in the future by way of improving the levees and addressing the deficiencies that are of them.

So there are several studies that have happened in terms of the different engineering that is looked at to understand precisely what's going on in the system from a hydrology and hydraulic perspective. The longer the period of record is that we have, rain data and snow melt

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data, the better understanding we have of what the peaks are. And even though the weather events and climate that's happened in the past, there's no certainty that's going to be what the future is.

Further, from a geotechnical perspective, aside from how the water comes down and how fast it's moving and how high it is, we need to understand what's going on inside the levees and what is underlying in their foundations. So in terms of what are the materials that are there and knowing, do we have material that can withstand through-seepage and under-seepage? And I have a diagram. In a moment we can get to that to talk a little bit more about those things that typically plague those levees.

So once again, Butte and Sutter County property owners came together to pass the Assessment District in 2010. That Assessment District is what funds this project. And there's also a companion study that is going on at the federal level. And that is being led by Corps of Engineers, State of California, Sutter Butte Flood Control Agencies, the nonfederal sponsors. And that's that Sutter Basin Feasibility Study to determine the federal interest in the project.

So that study is well underway. And additional documentation is going to be coming out to the public in

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2013. But even if a project were to be agreed upon, it would still require authorization by congress at the federal level. And even if it were to be authorized by congress, there would have to be a separate appropriation to allow that to happen, and for projects to be constructed under that feasibility study. So that's exactly why the Sutter Butte Flood Control Agency and the state of California are choosing to act now in advance of determining that ultimate federal project. Although the two planning efforts are going hand in hand, so that any activities undertaken by the state of California and Sutter Butte Flood Control Agency are essentially no-regress projects. And that these projects will be consistent with and compatible with whatever the determination might be out in the federal study.

So let's take a little bit closer look at the project itself. Once again, it's looking at the 41 miles from Thermalito Afterbay down to a little bit upstream of the Sutter Bypass confluence, and providing better flood risk management for those communities.

This is a map in green. What we see is the study area that the Corps of Engineers is looking at under the feasibility study. There's this red-dashed line, and that is the west levee of the Feather River that is specifically subject of this project. And you can see

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that it starts all the way at Thermalito up to the 70 shield, extending down past Biggs, Gridley, Live Oak, Yuba City, and ultimately ending right here just a little bit north of the confluence, the Sutter Bypass of the Feather River. So that's our study area.

So the primary deficiencies are through-seepage and under-seepage. And the typical treatments that are used to address these deficiencies are those sayings that we have seen on many of the river systems. They're improvement that went underway through the Central Valley. Specifically slurry cut-off walls are one mechanism that can be employed where the material that is at the core of the levee prism and underneath the levee foundation is taken out or reworked and replaced the material that has less detachability. And what that does is it prevents that seepage from happening at the same velocity through the levee, under the levee foundation.

There are other areas where a seepage berm might be more effective. And that is, rather than changing the material that is within the levee or under the foundation, is placing additional slurry material on the backside or the landward side of the levee that prevents boils from popping up on the land side. This diagram gives us a little better picture of what happens.

So during high water events, water weighs a lot,

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water has a lot of pressure behind it. That hydrostatic pressure that is in the river channel, the force of the water and volume of water that's in the river is impetuous flow. And that's what's causing the water surface elevation to rise. Water wants to go somewhere. It wants to move. It wants to find the path of least resistance. Unfortunately, sometimes that path of least resistance, instead of flowing downward through the channel and behaving within the levees like we would like it to, the water starts to move laterally. It wants to go somewhere.

And so when it moves through the levee prism itself, that phenomenon is known as through-seepage. When the material within the levee is simply not strong enough to keep the river within its course.

Other times that path of least resistance is underneath the foundation of the levee. And unfortunately in this region that's exactly what we've seen in the flood events of '86 and '97. In through-seepage, if the water starts to reach a certain velocity, it starts to take the soil material away with it and process sand boils. And when it starts to carry that soil, it essentially has a snowball effect. And it moves faster and faster and carries more of that soil with it, and the levee can simply collapse right upon its own foundation.

Or with through-seepage, once the water starts to

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blow out the backside of the levee, it starts to take that levee material away with it. And then the levee is just simply eroding off of its land side face. Also while it's trying to withstand the erosion of forces that are happening on its water side face at the same time.

Those are the primary deficiencies and the primary fixes that are looked at under the project.

So there are three alternatives that are described in the document as well as a no-action or no-project alternative.

Those three alternatives are -- the first one is looking through the lens of if we were to try to stay within the existing levee footprint or within the existing levee right of way, can we devise a project that would meet all of the objectives and current levee design criteria at the federal and state levels?

So that's Alternative 1 in the document. If we put on the blinders of "let's stay within the current footprint of levee."

Alternative 2 removes those blinders. It is looking at those measures that if you were to not be constrained by staying within the current footprint, what might that project look like and how might that project meet the objectives of 200-year protection as mandated by the state of California, and a 100-year of protection by

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the non-urbanized areas.

That's Alternative 2; outside of the footprint.

Alternative 3 is blending those two alternatives together. Looking on a reach-by-reach basis along the river. If we were to take the best or most appropriate measure based on a number of factors, whether it was primarily, how well is this measure or this fix addressing the problems that are evident at that particular point on the landscaping? Looking at real estate, looking at costs, looking at environmental considerations.

So Alternative 3 is a blend of those first two alternatives. And Alternative 3, the way it looks now, is it's undergoing design at 90-percent level. It is about 80 to 85 percent slurry cut off walls with the balance being seepage berms. And that alternative incidentally is also identified in the environmental document as the applicant-preferred alternative. Meaning, from a CEQA perspective, California Environmental Quality Act perspective, that is the project that, based on available data at this point, that the Sutter Butte Flood Control Agency is considering the most appropriate alternative that has the best merits for being the project objectives.

But, again, that's exactly what we're here for is to solicit your feed back and your comments on the affected environment. And when we say environment, we

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don't mean the bugs and bunnies, but also the human environment like landowners. How does the project affect agriculture? How does the project affect economics? So all of those topics are within the scope of the environmental document.

So a little bit more about the project. Right now the estimates are targeting a 300-million dollar project. About 75, 76 percent of that is slated to be paid for by the state of California, again, through those bonds that were passed. And then the remaining share would be paid by the members within the Assessment District. And that Assessment District lasts over 33 years.

So I started to get into the environmental process a little bit. And let's talk about it more in detail. Remember there are two primary environmental laws that the document -- that the project has to be compliant with. The National Environmental Policy Act, or California Environmental Quality Act, what the U.S. Army Corps of Engineers and Sutter Butte Flood Control Agency have elected to do for this project is to look at each of their responsibilities in an efficient way and studied under a single cover and single document. And there's a copy of that document in the back, and also a copy of that document back there. So there's not a separate NEPA

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document or separate CEQA document. Both of those environmental laws or compliance of those laws are being evaluated by a single cover cooperatively between the Corps of Engineers and Sutter Butte Flood Control Agency.

UNIDENTIFIED FEMALE FROM AUDIENCE: Does one hold precedence over the other?

MR. ELLIOTT: Does one hold precedence over the other? No, not necessarily. We can talk more specifically by what you might mean by that. But no, they are looked at in combination. And the agencies have cooperatively agreed on significant criteria and the findings of significance within the document through mitigation of measures, which will be ultimately adopted as part of the project, and have come to agreement on the effected environment and the methods through which the analysis will be conducted. But one does not hold precedence over the other. They each have specific needs which bear meaning under CEQA and NEPA for those perspective agencies.

I think that's probably covering everything that was intended by the slide. And that's just what we were talking about is the joint document, and I covered all of that.

Specifically, a little bit more about the 408 process. I talked about that in the beginning. But it's

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something that simply cannot be overlooked. And it's a very strong determining factor in how the project is going to be planned. Because what we would not want a situation to be is that one modification to the levee system in one discrete area to end up having adverse effects on another part of the system. We would not want to exacerbate or create conditions that were worse upstream, downstream or adjacent.

And that's one of the primary functions of what the Section 408 permission is for. It's to ensure the integrity of the system, and that is it is functioning as it was intended. Meaning it is functioning as a whole entire system. So we need to make sure levee function is not being impaired in the federal interest, and the project is being maintained and that the project is not injurious to the public.

And there are a number of factors that are looked at in determining 408 permission. Such as what are the type of modifications; what is the nature of the fix that is being proposed; and the different materials that are being proposing, and the methods that would be employed. So Sutter Butte Flood Control Agency is working very cooperatively and collaboratively with the Corps and state of California in the planning, designing. And that would continue through to construction and operations and

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makings of the project.

So why are we here today and why hold this public meeting? Well, one thing we're here for is to simply update you on where we are in the process. Many of you were at that scoping meeting back in June of 2011. So we are farther down the road in terms of project planning, its design, how the alternatives have been crafted, and we have an environmental analysis in the environmental document that is ready for your review.

It's also just an opportunity for you to talk to the various members of the project team, whether it be from Flood Control Agency side as well as the Corps of Engineers.

In fact, I think I neglected to introduce one of our team engineers, and that is Chris Kirvanec from HDR.

And, Chris, I apologize if I missed you in the introduction.

But Chris is here as well as others to go over your questions. And also simply we're here to comply with the NEPA and CEQA requirements.

So what the public scoping process highlighted, whether it was based on direct public feed back or other agencies who might have some interest in the project, the state of California has a number of different departments which have in their public trust certain resources whether

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it's the Department of Fish and Wildlife or at the federal level the U.S. Fish and Wildlife Service, National Marine Fishery Service, etc. Each of them have their own legal responsibility associated with the project.

So the scoping yielded some concerns about those resources that would need special attention within the environmental document. And some of those include construction-related effects. Those things that would only last during the period under which the project was being built. Such as affects on air quality from vehicle omissions or generation of dust, or from noise that would be generated by the project, or traffic and transportation that might be affected by the project. Such as road closures or additional truck trips that would be generated from the levee material that needs to be brought in. Or construction workers that will be coming to the site.

So there are those kinds of temporary affects. And the document also looks at property acquisition and what the ultimate real estate needs might be for the project. It looks at river access for recreation, and it looks at vegetation removal. And the Corps has a levee vegetation policy that has some controversy associated with it.

So the document evaluates under both the no-action condition as well as different project

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alternatives, what the ultimate compliance might be with the Corps' levee vegetation policy relative to this project.

So public comment period extends up until February 13th. And there are a number of ways that we invite your comments. Those comments, again, will appear in the EIS/EIR with full responses. And you can comment through e-mail. The handwritten address there in red is the way to do that through e-mail. It can also be done through fax, plain old snail mail using the comment cards here today, or comments you might choose to give to Jillian.

And these are the addresses that you could send hardcopy snail mail comments to Jeff Koschak with U.S. Army Corps of Engineers and with ICF on behalf of Sutter Butte Flood Control Agency. And I'll leave it on that slide.

I want to make sure there's nothing else to cover here other than thanking you for your attendance.

So what we'd like to do now is we recognize many of the questions you might have or comments you might have about the project, they might not be unique to you. And your neighbor might have precisely the same questions or comments. So we think it could be a great benefit in having an open dialogue about that. So that's what we'll

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do over the next 45 minutes to an hour or so. Or could be less, depending on what question or comments you have.

But if comments get to be too specific or we feel it'll be more effective to be able to help answer your question in a one-on-one setting, then we might defer it that way.

But at this point we are here for your comments. The way we'd like to do this is I will ask that you state your name first. And if you wouldn't mind, if you can stand. We want to make sure that Jillian can hear you. The acoustics aren't too bad in this room, but our microphone doesn't reach. So we'll ask you to speak loudly so we can get your name for the record as well as understanding what your comments or questions are.

And so I'll be assisted by the other members of the project team. And we can have anyone who would like to go first in terms of a question or comment about the project.

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PUBLIC COMMENTS

PH2-A1

VINCE HAMILTON: Is there any consideration for dredging some of the overgrown vegetation at the river bottoms that slows the flow of the river?

MR. ELLIOTT: And the question is about consideration given to dredging the river.

MR. INAMINE: That's a good question. And as you know, this project that Chris has described is strictly a levee-rehabilitation project. And I think the issue you're getting to is the vegetation and the sediment in areas like the lower Feather River, if I'm reading into your question correctly.

And for those areas or for many areas in the Sacramento system, that response channel maintenance lies with the Department of Water Resources. And so we're working with the department for a couple of programs to address things like sediment and vegetation rule. Because, you know, it's difficult. And I'm sure you're familiar with the issues. It really doesn't affect what we're doing, which is a very focussed project on the levees. Because the simple -- to sort of cut to the chase, is that the issues associated with vegetation and sediment, these levees are an under-seepage problem. And even when you remove, take into account, things like

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sediment and vegetation, the levees still fall down. Because even under the 100-year advantage and 200-year span, the under-seepage radiance, that's a measure of how levees perform due to under-seepage pressures, they're still inadequate. So even if you were to clean up these channels, you still have under-seepage issues with the levees.

But you raise a good point. And that's an issue that we are working with the Department of Water Resources to resolve for the long-term operation maintenance.

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PH2-B1

UNIDENTIFIED WOMAN FROM AUDIENCE: What's your current status of that discussion?

MR. INAMINE: Okay. So there's a couple of things that are happening.

The question was, what's the current status of that discussion.

Maybe to answer your question, let me back up a little bit and sort of frame what we're doing.

This is, again, levee-rehabilitation project. And it's set up to be a no-regress project. Whatever we do here is not -- we've looked at all kinds of alternatives. We've looked at dredging issues, we've looked at other alternatives for the levees and setbacks. We've looked at all manner of alternatives. We're obligated to do that. And we've come up with the least cost and most sufficient solutions.

Some of these more difficult issues, because of the environment issues, the long-term hydrology issues that are being investigated right now, they're going to take some time to resolve. They're going to take years to resolve. So there's two efforts right now that are underway. First is lower Feather River Corridor Management Program. And that's, I think, there's a couple folks here involved in that program. That looks at ways of incorporating the environment. There's a proposal to

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release sediment from the lower Feather River and to incorporate and engage restoration. That's obviously -- that's a longer discussion.

That's what we're doing. But that's the planning form that that specific issue is being looked at at the lower Feather River.

The other who asked about the status of that discussion, there's another important initiative that you're going to be hearing about over the next several months, and that's called the Central Valley Flood Protection Plan. And the phase that we're involved in is the Regional Flood Management Planning Program. I know that's a mouthful. But basically you probably are all familiar with Central Valley Flood Protection Plan that was adopted by the state of California in June of this year. That's sort of the other overarching mother of all flood management plans for the Central Valley. But it's just a framework. It's guidance for how the state used flood management should be implemented over the next several years.

What's happened since then is that the state has given local agencies -- rather than have the state do it, the state is providing 100 percent funding for local agencies to prioritize projects. And things like channel maintenance, operations and maintenance, that's one of

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those things that's on the plate for local activities to resolve over time.

But I don't want to give anybody illusions that it's going to take place very quickly. That's an issue that's going to take some time. But you're going to be hearing about that because the local agencies including SBFCA, Yuba County Water Agency and Marysville Levee Commission have bounded together and formed agencies over at both sides of the river.

And we'll be looking at these issues as well as other local flood management issues that we can prioritize them for the state for an eventual strategy to get that done.

So I know that's a long-muted answer to your question. But that's unfortunately the only answer.

MR. ELLIOTT: Just to talk a little bit more about the dredging issue as I understand from the Engineers, there was a period during the early part of the flooding history where dredging actually was a very effective and necessary maintenance of system. After that hydraulic period, where all that sediment had artificially raised the channel invert of the channel bottom of the rivers, all that sediment needed to go somewhere. So one method to do that was to drain it out. The other method was through placement of the levees in certain parts of

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the system to use the force of the river itself to force the sediments out.

However, what we see today, the river is basically back to what its originally natural channel invert can be. The elevation at the bottom of the river was about what it was before.

One of the things I didn't mention going into the flood management history was the fact that the levees that we have along the Feather were created in a period that was pre-Oroville. And the significance that that has is that without that upstream storage, there was need for taller levees. Now that we have that positional upstream storage, channel capacity is really not one of the limiting factors within the Feather system. But that doesn't change the fact what we do have in place with those levees. It's just, they're sandy, coarse materials that just aren't up to the challenge of being able to hold the force of the river back.

From looking at a hydraulic perspective as well, when you lower the channel invert, that doesn't necessarily lead to a corresponding prop in water service elevation. And in fact, sometimes it can have the opposite effect, because you're drowning water in more quickly.

Maybe I'll turn it over to Chris, that another

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potential problem that dredging in and of itself could contribute to it. It actually could exacerbate the seepage condition if I understand it. Maybe I can go back to that cross section.

If you can talk a little bit about that, Chris.

MR. KIRVANEC: As Chris was describing earlier, the key issue we're challenged with here is water seeping underneath this clay blanket that's shown here that the levee sits on, charging up the sands and gravels underneath and trying to pop through that blanket and create boils. And sometimes when you dredge on the water side of the levee, you're actually cutting out some of that blanket and you're exposing that sand out even more.

So we don't see it too often, but there are cases where you're actually making the conditions worse. Because instead of having to pass through the plane, you've exposed the right to all the pressures from the river.

MR. ELLIOTT: Next question or comment?

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AL SAWYER: Al Sawyer, Sutter County Public Works.

It's a construction-related question.

Did we look at the impacts of borrow pits? You're going to have seepage berms and you're going to bring in a lot of material. Where is this material coming from and how's it getting to the sites?

PH2-C1

MR. KIRVANEC: That's a great question. And backing up just from that, we've had a number of projects where we've constructed levees. It becomes very borrow-intense. And what we're going to do here is we're going to degrade the existing levee about half its height to build these slurry walls, and then reconstruct the levee about to where it is. And we do need to bring in the clay for the top. So as you see the water passing through the levee, that slurry wall and the clay pore are going to keep the water from going through.

That's the key borrow that we need is clay. A lot of these levees were built out of dredging material as we discussed, so water is going through them. But we need to bring in clay for them. So in the first project we're going to use something like 130,000 cubic yards of clay. And we've identified various sources. They're not nailed down yet. I think in the environmental document they're about 25 miles of the project sites. But we're still in

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negotiations with landowners, and we're still working through the details of that.

I know that's not a specific answer, but it's coming from within the basin generally that we were looking at one side on the outside. But it will be trucked and on road trucks over to the sites.

AL SAWYER: Specifically the haul road issue or impact on them. When the Corps did the ring levee around Marysville, they had a -- when the spec was being put together they had a meeting of local agencies. I attended

PH2-C2

that and I requested that a specific specification be put in the construction documents that referred the haulers or the contractors to Sutter County for specific haul-route permits. So we got very specific there and made it part of the contract to ensure that that didn't slip through the cracks.

MR. KIRVANEC: That's a great point. And the design team is working with the county more just recently and going through as we're identifying what the likely borrow sites are and the haul routes to get to the site, we're going to work with the county to get the permits we need in advance to do that. And that's something the contractor himself will have to get. We'll put that in part of the contract document.

And maybe we can talk more offline as well. But

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that's a good point. We'll make sure that's taken cake of.

MR. ELLIOTT: And to parallel that, in addition to ensuring that construction spec, if you don't intend to submit this as a formal comment, make sure we get your contact info so it can be written in the environmental document for the project and responded to that way.

So other questions or comments as a group? And don't feel as though we have to speak as a group. I mean, we are here. We have members of the team here and we have a member -- I didn't point out these map books that we have.

Michael, if you could hold one up there. This has excerpt figures from the environmental document. So we are prepared to talk to you each individually if you would prefer that way.

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PH2-D1

RICK SMALL: Should the feds come in with funding on the road, how does that affect our assessments?

MR. ELLIOTT: So the question was about should the federal government come in with funding, how does that affect the Assessment District?

MR. INAMINE: That's a great question. I'm going to try to make it as understandable as possible. It's a complicated answer. Sometimes I wake up in the middle of the night thinking about that question.

It's a great opportunity for us to have a federal project that's parallel to our project. So the whole history behind this program, which is funded by Bar 1E is that state locals do not want to wait for the federal government to do a feasibility study and go the authorization procreation way which it's typically been the 20 years for a project. And that's generally what it takes for a project to come in.

So what the state has done is they've advanced us the money for a state local -- totally self-contained state local project to build out the project that we need to protect our citizens and our livelihoods. So that's what we're doing. The state doesn't just say, "Here's 75 percent of the funding, now go do good work with it." They tell us, "Here's the money to go do this project. We're advancing you the money, but make sure you cooperate

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with the federal government and their study." So if the federal government finds out what we're doing today, that the state gets credit for that work and they can use that credit to do other work throughout the basin. Hopefully with some legislation throughout the valley.

So that's the deal. It's beneficial to us for several reasons. We're really the first region feasibility study that's so far along. And we have good reason to believe -- and I'm looking at our partners in the back with Corps of Engineers -- we have good reason to believe that the feasibility study, that they're going to find federal interest in the project. It looks very much like ours. That's a good thing.

So it provides a couple of things. It provides another opportunity to get work done. The no-regress project, the state is going to get credit for the work that we're doing. We tend to be cheaper and faster than the federal government. We can argue about this better, but we're certainly fast. And both agencies have been cheaper and faster.

The other important aspect of that is that sometimes the federal government can find federal interest that includes more of the project they need to do. Federal program also provides a great backup plan. In the event that some unknown thing happens, sometimes something

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catastrophic happens, and we run short of funding, the government is there with their project that is a little slower. But in this case it is a good thing they're slower, they can come along and finish the project.

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PH2-E1

UNIDENTIFIED MALE FROM AUDIENCE: Is there any fish and wildlife mitigation requirements? Or do we know that yet? Are we going to have to come up with mitigation of lands or something like that related to this project? Well, if we haven't already, but what's the extent of that and where are we looking to get this mitigation credit?

MR. ELLIOTT: So the question is to what degree is it known what the Fish and Wildlife Mitigations might need for the project.

So the answer is yes. We know that for any of the three alternatives there would be effects on fish and wildlife. Both in terms of species that are listed at the state level, species that are listed at the federal level, and non-listed species.

So when we look at the federal level, the National Marine Fishery Service has under their purview affects on salmon. And the Feather River is a very important habitat to salmon species, whether it's chinook or steelhead.

So at this point the project does propose some removal of waterside vegetation within the direct construction footprint of the project. That vegetation is being evaluated for -- or that vegetation loss is being evaluated for its affects on fish. Because primary habitat, waterside trees can be very important for salmon

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during certain life cycles. When the river is higher, when salmon are out migrating in the ocean, that's great refuge and forest habitat for them to hang out in that area.

So that's one species that we're looking at and one habitat that needs to be mitigated for.

Another is the Fish and Wildlife Service has two primary species in the area under his jurisdiction. The giant garter snake as well as the elderberry long-horn beetle. And the project does have some effects on those species. For giant garter snake, they are primarily temporary effects, only during construction. Where the levee slopes or canals might be temporarily unavailable to the snake.

In the case of elderberry long-horn beetle, its host plant is the elderberry shrub. There are some elderberry shrubs on the west levee of the Feather that will be removed by the project. So they would have to be replaced and additional habitat provided.

There are also some other -- that's it for the listed species. And then there are just some of the general conservation measures for avoidance and minimization of potential affecting on other species such as the work window, being the time of year the project would be built, and some of the methods of construction

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might be, at least in part, constrained by some of the species that might be there and their habitat.

So what's being looked at primarily to provide that habitat mitigation is additional planting within the back area that was created by LD1 and Star Bend. There's surplus area available, and that is the primary place where the habitat can be provided.

So it's an area that's already within the flood plan where it's been accounted for in terms of hydrology and hydraulics that would be a reasonable and safe place that additional habitat can be created. It doesn't present a flood management benefit or other incumbrances of additional properties.

That mitigation, which cannot be there, and at this point we're still working up the math and how much we go there versus what might be needed elsewhere. It's going to be in very small increments if there's anything that cannot be achieved within the existing Star Bend setback. And that would likely be through purchase of credits from commercial banks here locally.

Does that answer your question?

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RYAN SHORE: My name is Ryan Shore and I farm in Butte County. And I wanted to follow up on what the gentleman from Public Works just talked about. And I had a multipart question. I represent a group of other farmers as well who are concerned that any type of -- well, first of all let me say that I don't want to hinder your job. We know that you're going to have to have bulldozers and excavators to fix the levee. But beyond that, I think it's imperative to make sure that when we mitigate for some of these problems, that that land does not affect current farming operations, whether you've got walnut orchards or prune orchards or rice fields, whatever might be, at adjacent lands is that those new mitigation areas are improved or increased mitigation areas don't have a negative impact to neighboring and productive lands. If that makes sense.

PH2-F1

And beyond that, I think it's imperative -- and you touched on it briefly -- I think that if, as I understand, that any work that's done is not going to create new problems for future maintenance on the levees.

Does that make sense?

So as I understand what you intend to do won't create any new problems. So as we're repairing that levee, we're not setting ourselves up for problems cleaning and going forward. And I think that's imperative

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to maintain that.

So maybe you can touch on those couple of topics. Because I think those are imperative to landowners and farmers here in the area.

MR. ELLIOTT: That's well said. And your comments are absolutely making sense.

One from the perspective of any additional habitat that is created, it is important that there needs to be recognition and planning for compatibility with adjacent landowners. Whether that's residences or whether it's farming. And when it's farming, whether that's rice or whether it's orchards, whatever it happens to be, that those future uses opposed by the project do not in any way jeopardize the sustainability of those existing current land uses. And that's exactly why additional mitigation or habitat created at Star Bend, given that's the site that's already been set aside for this purpose, rather than looking at new lands that would be brought in as habitat under the project, makes sense. And at this point it looks like the math works out such as that would be the case.

And then your second point right now -- maintenance.

The project, while it is not a direct intention or an objective of this project, that it would bring the

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entirety of this 41 miles of Feather River west levee in the compliance with the Corps' levee vegetation policy. If you're fairly familiar with the levee, you'll know it's already pretty clean. It's not like where you might go along certain areas in Sac or especially as you get down to the lower part of Sacramento Valley in the Delta where those levees are heavily noncompliant. The Feather, that's where 99 percent of the vegetation is, is without -- it is outside of the levee prism and is within the flood plan.

That being said, there are areas where the levees are not compliant. And that presents a challenge in terms of how the state of California gets through the delegated responsibility to the Levee District and Reclamation District. And how the O&M is carried out in compliance with the federal standards to ensure eligibility for federal programs and federal assistance. And just keeping the levees to meet the certain accreditation needs.

I know I'm coming about this in a roundabout way, but where the project is touching the levees, it is removing that vegetation that is noncompliant with the direct footprint and is not replacing vegetation in that spot. So the levees where they're touched by the project will be left in a compliant state. But that is not to say that all 41 miles will be compliant once the project is

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complete. Because Sutter Butte Flood Control Agency is working cooperatively with the state of California through a multi-agency effort. The state level is working with the Corps of Engineers to see the long-term solution where there can be agreement on precisely that levee vegetation management issue.

And I know that's only one component of O&M. But yes, it is a definite design criteria and project objective to look at measures that don't place a long term O&M.

One thing you'll notice is that the project does not rely on heavy use of relief wells. Which relief wells are measured, which are very site-specific, very localized effective measures in some circumstances. But it's also a measure that you can't just walk away from. You need to make sure those relief wells are functioning the way they were intended and that the water is moving in safe fashion.

Because the water has got to go somewhere. Just need to make sure that's being done in controlled ways that isn't going to result in a flood event. We're looking at things as slurry cut-off walls and seepage berms, which, while they still require O&M, and they still require performance observation during flood events, there's not something that's quite so active as there is

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with something like a relief well.

So definitely held into consideration and being taken in mind as well as the easements in the area that are necessary to keep the levee functioning the way it should be.

So does that touch up on your question?

RYAN SHORE: I think so.

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PH2-G1

JERRY ORR: Are you planning on removing any of the relief wells that are in existence now?

MR. BESSETTE: That's a great question. In reach 13 around Shanghai Bend there's a big relief well system there. And with our project, we're actually going to make that system, it's not going to be needed in the future. We're going to construct the slurry wall and get it at the depth where we're going to cut off that seepage and convert those relief wells to observation wells. So we'll keep them in place, but they won't be functioning as they are now. And they won't be necessary for the system to operate properly. So that will actually help reduce them from all responsibilities for LD-1.

MR. ELLIOTT: Next question?

Okay. Well, we are here if you would like to come up and see each of us individually. And we have copies of these map books about what the project footprints are.

But thank you again for coming and thank you for your interest.

And if you have comments, please see Jillian or you can use one of these comment cards.

(Whereupon the meeting adjourned at 4:19 p.m.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss
COUNTY OF SACRAMENTO)

I, JILLIAN M. BASSETT, a Certified Shorthand Reporter, licensed by the state of California and empowered to administer oaths and affirmations pursuant to Section 2093 (b) of the Code of Civil Procedure, do hereby certify:

The said proceedings were recorded stenographically by me and were thereafter transcribed under my direction via computer-assisted transcription;

That the foregoing transcript is a true record of the proceedings which then and there took place;

That I am a disinterested person to said action.

IN WITNESS WHEREOF, I have subscribed my name on February 4, 2013.

_____
JILLIAN M. BASSETT
Certified Shorthand Reporter No. 13619

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Response to PH2-A, Vince Hamilton

PH2-A1

This project is strictly a levee-rehabilitation project. And I think the issue you're getting to is the vegetation and the sediment in areas like the lower Feather River, if I'm reading into your question correctly. And for those areas or for many areas in the Sacramento system, that response channel maintenance lies with the California Department of Water Resources. And so we're working with the department for a couple of programs to address things like sediment and vegetation rule. Because, you know, it's difficult. And I'm sure you're familiar with the issues. It really doesn't affect what we're doing, which is a very focused project on the levees. Because the simple—to sort of cut to the chase, is that the issues associated with vegetation and sediment, these levees are an under-seepage problem. And even when you remove, take into account, things like sediment and vegetation, the levees still fall down. Because even under the 100-year advantage and 200-year span, the under-seepage radiance, that's a measure of how levees perform due to under - seepage pressures, they're still inadequate. So even if you were to clean up these channels, you still have under-seepage issues with the levees. That's an issue that we are working with DWR to resolve for the long-term operation maintenance. Comment did not necessitate change to the Final EIS.

Response to PH2-B, Unidentified Female

PH2-B1

This is, again, a levee-rehabilitation project. And it's set up to be a no-regress project. Whatever we do here is not—we've looked at all kinds of alternatives. We've looked at dredging issues; we've looked at other alternatives for the levees and setbacks. We've looked at all manner of alternatives. We're obligated to do that. And we've come up with the least cost and most sufficient solutions.

Some of these more difficult issues, because of the environment issues, the long-term hydrology issues that are being investigated right now, they're going to take some time to resolve. They're going to take years to resolve. So there's two efforts right now that are under way. First is lower Feather River Corridor Management Program. And that's, I think, there's a couple folks here involved in that program. That looks at ways of incorporating the environment. There's a proposal to release sediment from the lower Feather River and to incorporate and engage restoration. That's obviously a longer discussion. That's what we're doing. But that's the planning form that that specific issue is being looked at the lower Feather River.

The other who asked about the status of that discussion, there's another important initiative that you're going to be hearing about over the next several months, and that's called the Central Valley Flood Protection Plan. And the case that we're involved in is the Regional Flood Management Planning Program. I know that's a mouthful. But basically you probably are all familiar with Central Valley Flood Protection Plan that was adopted by the state of California in June of this year. That's sort of the other overarching mother of all flood management plans for the Central Valley. But it's just a frame work. It's guidance for how the state used flood management should be implemented over the next several years.

What's happened since then is that the state has given local agencies—rather than have the state do it, the state is providing 100% funding for local agencies to prioritize projects. And things like

channel maintenance, operations and maintenance, that's one of those things that's on the plate for local activities to resolve over time.

But I don't want to give anybody illusions that it's going to take place very quickly. That's an issue that's going to take some time. But you're going to be hearing about that because the local agencies including SBFCA, Yuba County Water Agency and Marysville Levee Commission have bounded together and formed agencies over at both sides of the river. And we'll be looking at these issues as well as other local flood management issues that we can prioritize them for the state for an eventual strategy to get that done.

There was a period during the early part of the flooding history where dredging actually was a very effective and necessary maintenance of system. After that hydraulic period, where all that sediment had artificially raised the channel invert of the channel bottom of the rivers, all that sediment needed to go somewhere. So one method to do that was to drain it out. The other method was through placement of the levees in certain parts of the system to use the force of the river itself to force the sediments out. However, what we see today, the river is basically back to what its originally natural channel invert can be. The elevation at the bottom of the river was about what it was before.

One of the things I didn't mention going into the flood management history was the fact that the levees that we have a long the Feather were created in a period that was pre- Oroville. And the significance that that has is that without that upstream storage, there was need for taller levees. Now that we have that positional upstream storage, channel capacity is really not one of the limiting factors within the Feather system. But that doesn't change the fact what we do have in place with those levees. It's just, they're sandy, coarse materials that just aren't up to the challenge of being able to hold the force of the river back.

From looking at a hydraulic perspective as well, when you lower the channel invert, that doesn't necessarily lead to a corresponding prop in water service elevation. And in fact, sometimes it can have the opposite effect, because you're drowning water in more quickly.

The key issue we're challenged with here is water seeping underneath this clay blanket that's shown here that the levee sits on, charging up the sands and gravels underneath and trying to pop through that blanket and create boils. And sometimes when you dredge on the waterside of the levee, you're actually cutting out some of that blanket and you're exposing that sand out even more.

So we don't see it too often, but there are cases where you're actually making the conditions worse. Because instead of having to pass through the plane, you've exposed the right to all the pressures from the river. Comment did not necessitate change to the Final EIS.

Response to PH2-C, Al Sawyer

PH2-C1

We've had a number of projects where we've constructed levees. It becomes very borrow- intense. And what we're going to do here is we're going to de grade the existing levee about half its height to build these slurry walls, and then reconstruct the levee about to where it is. And we do need to bring in the clay for the top. So as you see the water passing through the levee, that slurry wall and the clay pore are going to keep the water from going through. That's the key borrow that we need is clay. A lot of these levees were built out of dredging material as we discussed, so water is going

through them. But we need to bring in clay for them. So in the first project we're going to use something like 130,000 cubic yards of clay. And we've identified various sources. They're not nailed down yet. I think in the environmental document they're about 25 miles of the project sites. But we're still in negotiations with landowners, and we're still working through the de tails of that. It's coming from within the basin generally that we were looking at one side on the outside. But it will be trucked and on road trucks over to the sites. Comment did not necessitate change to the Final EIS.

PH2-C2

The design team is working with the county more just recently and going through as we're identifying what the likely borrow sites are and the haul routes to get to the site, we're going to work with the county to get the permits we need in advance to do that. And that's something the contractor himself will have to get. We'll put that in part of the contract document. Comment did not necessitate change to the Final EIS.

Response to PH2-D, Rick Small

PH2-D1

It's a great opportunity for us to have a federal project that's parallel to our project. So the whole history behind this program, which is funded by Bar 1E is that state locals do not want to wait for the federal government to do a feasibility study and go the authorization procreation way which it's typically been the 20 years for a project. And that's generally what it takes for a project to come in. So what the state has done is they've advanced us the money for totally self- contained state local project to build out the project that we need to protect our citizens and our livelihoods. So that's what we're doing. The state doesn't just say, "Here's 75% of the funding, now go do good work with it." They tell us, "Here's the money to go do this project. We're advancing you the money, but make sure you cooperate with the federal government and their study." So if the federal government finds out what we're doing today, that the state gets credit for that work and they can use that credit to do other work throughout the basin. Hopefully with some legislation throughout the valley. So that's the deal. It's beneficial to us for several reasons. We're really the first region feasibility study that's so far along. And we have good reason to believe—and I'm looking at our partners in the back with USACE—we have good reason to believe that the feasibility study, that they're going to find federal interest in the project. It looks very much like ours. That's a good thing. So it provides a couple of things. It provides another opportunity to get work done. The no-regress project, the state is going to get credit for the work that we're doing. We tend to be cheaper and faster than the federal government. We can argue about this better, but we're certainly fast. And both agencies have been cheaper and faster. The other important aspect of that is that sometimes the federal government can find federal interest that includes more of the project they need to do. Federal program also provides a great back up plan. In the event that some unknown thing happens, sometimes something catastrophic happens, and we run short of funding, the government is there with their project that is a little slower. But in this case it is a good thing they're slower, they can come a long and finish the project. Comment did not necessitate change to the Final EIS.

Response to PH2-E, Unidentified Male

PH2-E1

We know that for any of the three alternatives there would be effects on fish and wildlife. Both in terms of species that are listed at the state level, species that are listed at the Federal level, and non-listed species.

So when we look at the Federal level, the NMFS has under their purview effects on salmon. And the Feather River is a very important habitat to salmon species, whether it's Chinook or steelhead. So at this point the project does propose some removal of waterside vegetation within the direct construction foot print of the project. That vegetation is being evaluated for, or that vegetation loss is being evaluated for its effects on fish. Because primary habitat, water side trees can be very important for salmon during certain life cycles. When the river is higher, when salmon are out migrating in the ocean, that's great refuge and forest habitat for them to hang out in that area.

So that's one species that we're looking at and one habitat that needs to be mitigated for. Another is the USFWS has two primary species in the area under its jurisdiction, the giant garter snake, as well as the elderberry long-horn beetle. And the project does have some effects on those species. For giant garter snake, they are primarily temporary effects, only during construction where the levee slopes or canals might be temporarily unavailable to the snake.

In the case of elderberry long- horn beetle, its host plant is the elderberry shrub. There are some elderberry shrubs on the west levee of the Feather that will be removed by the project. So they would have to be replaced and additional habitat provided.

There are also some other—that's it for the listed species. And then there are just some of the general conservation measures for avoidance and minimization of potential affecting on other species such as the work window, being the time of year the project would be built, and some of the methods of construction might be, at least in part, constrained by some of the species that might be there and their habitat.

So what's being looked at primarily to provide that habitat mitigation is additional planting within the back area that was created by LD 1 and Star Bend. There's surplus area available, and that is the primary place where the habitat can be provided. So it's an area that's already within the flood plan where it's been accounted for in terms of hydrology and hydraulics that would be a reasonable and safe place that additional habitat can be created. It doesn't present a flood management benefit or other encumbrances of additional properties. That mitigation, which cannot be there, and at this point we're still working up the math and how much we go there versus what might be needed elsewhere. It's going to be in very small increments if there's anything that cannot be achieved within the existing Star Bend setback. And that would likely be through purchase of credits from commercial banks here locally. Comment did not necessitate change to the Final EIS.

Response to PH2-F, Ryan Shore

PH2-F1

It is important that there needs to be recognition and planning for compatibility with adjacent landowners, whether that's residences or whether it's farming. And when it's farming, whether that's rice or whether it's orchards, whatever it happens to be, that those future uses opposed by the

project do not in any way jeopardize the sustainability of those existing current land uses. And that's exactly why additional mitigation or habitat created at Star Bend, given that's the site that's already been set aside for this purpose, rather than looking at new lands that would be brought in as habitat under the project, makes sense. And at this point it looks like the math works out such as that would be the case.

And then your second point right now—maintenance. The project, while it is not a direct intention or an objective of this project, that it would bring the entirety of this 41 miles of Feather River west levee in the compliance with the USACE's levee vegetation policy. If you're fairly familiar with the levee, you'll know it's already pretty clean. It's not like where you might go a long certain areas in Sac or especially as you get down to the lower part of Sacramento Valley in the Delta where those levees are heavily noncompliant. The Feather, that's where 99% of the vegetation is, is without—it is outside of the levee prism and is within the flood plan .

That being said, there are areas where the levees are not compliant, and that presents a challenge in terms of how the state of California gets through the delegated responsibility to the Levee District and Reclamation District, and how the operations and maintenance (O&M) is carried out in compliance with the federal standards to ensure eligibility for federal programs and federal assistance, and just keeping the levees to meet the certain accreditation needs.

I know I'm coming about this in a roundabout way, but where the project is touching the levees, it is removing that vegetation that is non-compliant with the direct foot print and is not replacing vegetation in that spot. So the levees where they're touched by the project will be left in a compliant state. But that is not to say that all 41 miles will be compliant once the project is complete. Because Sutter Butte Flood Control Agency is working cooperatively with the state of California through a multi-agency effort. The state level is working with the USACE to see the long-term solution where there can be agreement on precisely that levee vegetation management issue.

And I know that's only one component of O&M. But yes, it is a definite design criteria and project objective to look at measures that don't place a long term O&M. One thing you'll notice is that the project does not rely on heavy use of relief wells. Which relief wells are measured, which are very site-specific, very localized effective measures in some circumstances. But it's also a measure that you can't just walk away from. You need to make sure those relief wells are functioning the way they were intended and that the water is moving in safe fashion, because the water has got to go somewhere. Just need to make sure that's being done in controlled ways that isn't going to result in a flood event.

We're looking at things as slurry cut-off walls and seepage berms, which, while they still require O&M, and they still require performance observation during flood events, there's not something that's quite so active as there is with something like a relief well. So definitely held into consideration and being taken in mind as well as the easements in the area that are necessary to keep the levee functioning the way it should be. Comment did not necessitate change to the Final EIS.

Response to PH2-G, Jerry Orr

PH2-G1

In reach 13 around Shanghai Bend there's a big relief well system there, and with our project, we're actually going to make that system, it's not going to be needed in the future. We're going to construct

the slurry wall and get it at the depth where we're going to cut off that seepage and convert those relief wells to observation wells. So we'll keep them in place, but they won't be functioning as they are now, and they won't be necessary for the system to operate properly. So that will actually help reduce them from all responsibilities for LD 1. Comment did not necessitate change to the Final EIS.

Public Hearing 2, January 16, 2013, 6:00 p.m.

Public Hearing
PH2, 6:00pm

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Feather River West Levee Project

Public Meeting

Wednesday, January 16th, 2013

Yuba City Veterans Memorial Community Building

1425 Veterans Memorial Circle

Yuba City, California

6:00 p.m.

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Reported By: Jillian M. Bassett, CSR No. 13619

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I N D E X

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PRESENTATION

Good evening, and thank you for coming. And welcome to the Sutter Butte Flood Control Agency and U.S. Army Corps of Engineers meeting on the Feather River West Levee Project.

So I have about a 30-minute presentation that I'm going to be going through. And after that, we'll have general comments and questions and answers that we'll be taking as a group. Because we understand that many of you might have comments or questions that might be precise, or the same ones that interest your neighbor.

We also have other members of the team here this evening. So if the question is very specific or if you would prefer not to speak in front of the whole group, then we can talk one on one, individually.

So before we get too far into it I'll introduce who I am. My name is Chris Elliott and I'm with a consulting firm, ICF. My office is in Sacramento. And we also have an office in the valley in Redding. We have prepared the environmental document as a consultant to the Sutter Butte Flood Control Agency and working with U.S. Army Corps of Engineers.

So other members of the team we have is Mike Inamine. He is the Executive Director of the Sutter

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Butte Flood Control Agency.

And Michael Bessette is Director of Engineering of Sutter Butte Flood Control Agency. So they are Sutter Butte Flood Control Agency's permanent, full-time staff working to advance that project as well as the other objectives that Sutter Butte Flood Control Agency has.

They are assisted by Chris Krivanec for the Feather River West Levee Project.

Kim Floyd, many of you probably know, has been working with the Flood Control Agency for a number of years and specifically met many of you through the Assessment District, which we passed back in 2010.

In the back of the room there you were probably greeted by either Michelle or Ingrid. And they are with ICF.

And up here in the front of the room is Jillian. And Jillian is our court reporter. She is taking detailed minutes of this meeting. And then is also available after the meeting. If you would like to make comments to her that would be officially on the record and included and published in the final environmental impact statement and environmental impact report with a detailed response, then we invite you to talk to Jillian.

That's not the only way to get your comments into the record. That's one of the mechanisms we have

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available.

So we also have Barry O'Regan who is consultant to Sutter Butte Flood Control Agency. So Barry is around here somewhere.

And then assisting Barry, he oversees the environmental part as well as the real estate. Two other members of our real estate team are here this evening, Debby and Rebecca, to help talk about real estate acquisition issues if you have specific issues about that.

Then that represents the Sutter Butte Flood Control Agency team. And also the U.S. Army Corps of Engineers has representatives here as well. Specifically Adam Riley standing there in the back. He is the Corps' Project Manager. He's with the operation and navigation section of Corps. And they have a special responsibility or authority over the project. And that would include River and Harbors Act Section 408 permission. And that is where Sutter Butte Flood Control Agency is working with the state of California through the Central Valley Flood Protection Board has requested permission to modify the levees and alter the levees for the flood improvements that are the subject of the environmental document and are being proposed by the Sutter Butte Agency.

We also have Matt Davis with us from the Corps of Engineers. Matt has been coordinating with the

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Feather River West Levee Project, working specifically on the Sutter Basin Feasibility Study.

Back in June of 2011 in this very room we held public scoping meetings that were joint scoping meetings both for the Feather River West Levee Project and the Sutter Basin. Tonight we're here to talk primarily about the Feather River West Levee Project. That is the subject of the environmental impact statement and environmental impact report. But if you have questions about the feasibility study, Matt can answer some of those.

We also have Joe who is an archeologist with the U.S. Army Corps of Engineers. Certainly an important part of the environment that the project may affect. So Joe is here and has knowledge and expertise in those issues if you have questions in that regard.

And we are also joined by one of the Sutter Butte Flood Control Agency Board members, Bo Sheppard is here this meeting.

Also with the Corps of Engineers, Laura Whitney who is the Project Manager for the Sutter Butter Feasibility Study.

So did I catch everybody who is part of the project team?

Okay. So about the presentation. So it's broken down into four general parts. First we're going to talk a

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little bit about project background. And then I want to go to a little bit more of the history and context about why the project is important and why it's important to act for flood-risk deduction in this area. And then we'll look more specifically about the measures that are being proposed and how those measures are crafted into alternatives that are going through further design development and are the subject of the environmental document. And then lastly we'll look more specifically at the environmental process itself.

So getting into the project background. So the Sutter Butte Flood Control Agency is a joint powers authority. And what that essentially means in the California law is that there are several individual entities who are choosing to work collaterally and cooperatively as a single entity. So Levee Districts 1 and 9, as well as the counties of Sutter and Butte and the cities of Yuba City, Live Oak, Gridley, and Biggs, are all member of the agencies, Flood Control Agency, and working towards advancing these levee improvements.

Sutter Butte Flood Control Agency is advancing this project based on the funds that were passed through the local Assessment District. And the purpose is to look most specifically at the 41 miles of the Feather River and the western levee of the river. And we have some

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diagrams. I can show that a little bit more in detail.

So construction is slated to start in 2013. A project that is 41 miles in its scope cannot be built in a single construction season. So would likely progress three years beyond that initial construction. And Sutter Butte Flood Control Agency is working cooperatively with the state of California through both the Department of Water Resources and Central Valley Flood Protection Board to advance the project.

Department of Water Resources' role is that they administer the bond funds that were passed through state propositions 84 and 1E, which is a major part of funding for the project. And then Central Valley Flood Protection Board has the responsibility for overseeing the operations and maintenance activities of the Federal Flood Control Project.

And so, again, one of the reasons we're here tonight is to talk about what's in the environmental document in terms of the alternatives and how they're described, the environment that might potentially be affected by the project. The environment, I use in a broad sense, not just the ecology or the natural part, but also deals with human environment and things that affect us as well. Whether it's issues of land use, agriculture, economics, etc. And so that draft environmental document

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was released out on the street in December of 2012 and comments are due in February. So they need to be wrapped up into a final environmental document and then ultimately provided to the hands of the decision makers.

Sutter Butte Flood Control Agency has to adopt the project as well as the Corps of Engineers, and carry out their responsibilities under the River and Harbors Act as well as Clean Waters Act. And there are a number of other states that hold some authority over the project, and that this document provides the foundation for that decision.

So how did we get here? Let's talk a little bit about the history that contributes to the flood risk and flood management situation that we're in.

So prior to European Settlement and what happened after the discovery of gold in this region, the Feather and Sacramento Rivers, with quite great frequency, would overtop their banks, and would leave their primary channel. So what we had on the valley floor was a mosaic of seasonal wetlands, perennial wetlands, grasslands, oak savanna, and other habitat-types like that that were subject to the rivers leaving their primary course, which is the valley floor.

What we saw happen after that time as we looked for more efficient ways to extract the precious gold was a

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particular method called hydraulic mining. And what hydraulic mining did is it forced water through a cannon that would blast the rock, it would blast Sierra Foothills to separate the gold from the soiled material. Very effective at doing that.

But one of the things that was a cost and a result of that was that all that sediment had to go somewhere. And millions of cubic yards in the foothills choked the Bear, the Feather, the American, the Yuba, and all those rivers that drained the Sierra Foothills. And it caused the channels to rise. And what that contributed to was that the rivers, which already were subject to periodic inundation, could not even contain the water that was there previously.

So that had many problems. Many problems specifically in this area where the rivers were no longer navigable, where farms were no longer farmable because they were so frequently flooded. The towns and the cities were flooded themselves. So it had general problems in terms of health, life safety, commerce and just the regular ways of going about our lives.

So what started to happen was that individual landowners and farmers would build their own levees to protect their land. And as landowners started to work more cooperatively together in how the levees might be

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placed, it became more a network of contributing to how not only could we manage that sediment and manage the water, but also create area that was available for agriculture.

So ultimately over time those levees were then later adopted in early part of the 20th century by the Corps of Engineers and Sacramento Flood Control Project. Those older levees were grandfathered in and further improved over time as funds were available and as the needs were available.

But basically what we have to remember is a lot of these levees were basically constructed from whatever material had to be on hand. Sometimes that method was dredged material that was taken from the river and old deposits that had been washed down. Or maybe it was from scraping the adjacent land surface and taking the farmable land down by a few feet to construct these levees. What that means for us today is that this was not the material that you would choose to build a levee if you had other means available. It was coarse, alluvial soils, not very well consolidated, not able to be placed with the compaction standards or the other things of how an engineer would go about and a contractor would appropriately build a levee in contemporary times.

And we get these periodic reminders of this, of

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how fragile the levee system is. Specifically in 1955 we had a local flood from a levee breach at Shanghai Bend. Which killed a documented 38 people, but it is well known that more than 38 people lost their lives in that flood.

After that time in 1967, Oroville Dam Reservoir was created which provided some flood management, some flood continuation ability to take off those peak flows.

Later than that New Bullards Bar was created, which also provided additional flood capacity. But even with that being said, we still have a very fragile levee system. And again, we have reminders of that in 1986 and 1997, the flood event that inundated tens of thousands of acres right here. And lives were lost, property was damaged and businesses came to a standstill.

So it's precisely those kinds of conditions of why additional studies have gone underway and why improvements are necessary to address what's wrong with the levees.

So some of those studies have been sponsored by the U.S. Army Corps of Engineers. Others have been done by the State Department of Water Resources as well as Sutter Butte Flood Control Agency. And with each of these studies, we are able to get a better and stronger understanding of the science and engineering of what's going on within the levee prism and also what is

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underlying the levee within its foundation. And so by virtue of the Assessment District, which was passed in 2010, it is able to fund projects to improve the levees. And there's not only the Feather River West Levee Project, which is the primary purpose of the project, which Sutter Butte Flood Control Agency is seeking to start construction in 2013, but there's a companion federal study, which is the Sutter Basin Feasibility Study. Which was subject to the scoping meetings back in 2011.

But while that project is moving along at a great pace now, it has been a subject of a national pilot study of how the federal government can move more quickly. It's still subject to authorization by Congress. And that's not a certainty. And once the project is authorized by Congress, then we'll set up a new procreation. Meaning, even if the project was authorized, that's not a guaranteed of funding. But Sutter Butte Flood Control Agency is in a situation where based on the state money that's available and the local money that's been paid right here in the Assessment District, it allows levee improvements to move forward more quickly, coordinated in a way with the Corps of Engineers to ensure it would be a no-regress project. Meaning it would be compatible with and consistent with what the Corps might ultimately

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determine to be in federal interest. And that the projects might work together hand in glove.

So let's take a little bit of a closer look at the project itself. Once again, it's about 41 miles of levee, west levee Feather River starting at the very north at Thermalito Afterbay and extending down to, but not quite reaching the Sutter Bypass confluence with the Feather River. It stops about three or four miles short of that for this first phase.

So what it's intended to do is to achieve 200-year protection for urbanized areas. And that's a specific mandate for the state of California, which was passed a few years ago. Also which populations of greater than 10,000 persons need to have 200-year protection. And Sutter Butte Flood Control Agency is seeking this project to be in compliance with that state mandate. And then the non-urbanized areas need to have a level of protection of at least 100 years. So those are the targets. And specifically looking to provide those benefits to Live Oak, Biggs, Gridley, and Yuba City.

So this is a map that shows this area. What you see shaded in green is the Sutter Basin Feasibility Study area, which is subject of the Corps' study. And specifically what Sutter Butte Flood Control Agency Project is looking at is a very important leg of that

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basin, of that perimeter. And that's the 41 miles on the Feather River west levee. So we have Thermalito Afterbay up there at the far north, the top of the map. And then the red-dashed line that represents the project area for the Feather River West Levee Project. And that's where it stops short, not quite reaching the confluence with the Sutter Bypass.

So we talked about how these levees don't meet current standards and how these levees have some problems that have subjected them to flooding events in prior years. So the primary deficiencies these levees have are known as through-seepage and under-seepage. And the treatments that are available to address through-seepage and under-seepage, they're fairly common in other projects that have been advanced in other parts of the Central Valley.

For through-seepage, we can look at things like, if we put a barrier right in the core of the levee that is less permeable than the ground levee material, then that would serve to impede the water from flowing through. If we were to put additional material on the backside of the levee as a berm appended to the levee, that has the benefit of being able to stop water from popping up and boiling up on the landward side.

So here is a cross-sectional diagram that takes a

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closer look at both of those phenomenon. So what happens is, if you get higher staged in the river, and the river has a lot of force behind it -- water weighs a lot. It wants to move. But the water starts to back up. And if the water can't move down the river channel and behave itself like it's supposed to, the water wants to spread laterally. The water is looking for the path of least resistance. Unfortunately, sometimes that path of least resistance is through the levee or under the levee. So we have a situation where a high river stage, high level of water, creates hydrostatic pressure. It's forcing the water outward, laterally, sideways. If it goes through the levee, what happens is it can start to take that soil material away with it. The water reaches a certain velocity, it's hungry, it's hungry for dirt. So it starts to carry dirt with it. And you see the landslide face of the levee erode away.

The other thing that can happen is the water seeping underneath the levee, and it starts to take out the foundation. And it does exactly the same thing. It can reach a certain velocity, a certain force behind it, and it starts to take the dirt with it. And it can cause the levee to collapse right in its foundation.

So the levee events that we've seen, the failure events that we've seen, '55, '86, '97, and events prior to

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that, these are the situations that have contributed to those levee failures. It's not like we hear on the news about floods in the Midwest in Missouri or Mississippi where they get concerned about flood stage. Yes, we are concerned about flood stage here, but the levees that are along the Feather, it's not an issue that they're not tall enough. It's the fact they're not strong enough. They're not built in the material and not built in the engineering and construction standards that we know today provide a better level of protection.

So the project is estimated to cost approximately 300-million dollars for that 41 miles. And I talked about the state funding. And the state share is expected to be about 76 percent of that 300 million, with the balance coming from the Assessment District and paid right here locally through that. Which would last over 33 years.

So a little bit about the environmental process. National Environmental Policy Act and California Environmental Quality Act, those are the two umbrella environmental regulations. Just as its name implies, National Environmental Policy Act is at the federal level; California Environmental Quality Act is at the state level. What these laws call for is that an agency in considering an action just as Sutter Butte Flood Control Agency is considering an action to adopt and advance the

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project and put in construction. And the Corps of Engineers has an action in terms of granting permission for that project for those things over which it has authority, need to evaluate what the effects of taking those actions would be on the environment.

And again, environment is defined very broadly. And there are about 17 different resource topics that are looked at under National Environment Policy Act and California Environmental Quality Act with a physical environment, built environment and the social human environment.

So what the document does is it looks at the various measures and how they've been formulated into alternatives. Measures being things like seepage berm here, slurry cut-off wall there, and how they're crafted into an entire project of alternatives that meet the project objectives. Again, those objectives are 200-year protection in urbanized areas; 100 years for non-urban areas.

So looking at the alternatives in a little bit more depth, the document addresses three construction alternatives. And also it's a requirement that a no-action or no-project alternative be a value.

So what are those three alternatives?

The first alternative looks through the lens of

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if we take those measures that keep within the existing levee footprint and have minimal, if any, additional right-of-way requirements, can we achieve the project objectives with an alternative that looks like that? That's Alternative 1. Primarily relies on seepage cut-off walls for its entirety.

Alternative 2 removes that lens. Alternative 2 is looking at what are those additional measures that we might employ if we didn't look at just staying within the levee footprint? What if we looked at other measures that are not within the current levee prism? That's Alternative 2. Taking off that constraint of where we're defining measures.

Alternative 3 is a blend of both alternatives 1 and 2. If we were to look at what measure, regardless of other factors, best addresses the deficiencies or fixes the levee most effectively, that we can have the highest confidence based on engineering and science. And if we look at real estate, if we look at environmental consideration, if we look at how adjacent properties might be affected, that's Alternative 3. It's factoring all those things to blend alternatives 1 and 2 to have a composite that would be the optimal alternative.

So incidentally that's the alternative that the Sutter Butte Flood Control Agency has identified. It's

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known in the document as the applicant-preferred alternative. So that is the alternative that's based on all of the information, studies to date, and looks like it has the best bearing. And that's what you see in the document.

So this document is a joint document. And I described what we mean by that a little bit in the beginning. But just as Sutter Butte Flood Control Agency and U.S. Army Corps of Engineers and the state of California are looking at how to address the problem in a collateral fashion, this document is also put together in collateral fashion. So instead of having a separate document for the Corps of Engineers and a separate document for Sutter Butte Flood Control Agency, they're working cooperatively on a single document under one cover. It's more efficient, it's easier to read, and it provides for more transparent and more effective decision making.

So once again, Sutter Butte Flood Control Agency is acting as the lead from the state side and is the California Environmental Quality Act lead in making an ultimate decision. But there are other agencies, too, relying on this document and making their decisions for this project. Such as the California Department of Fish and Wildlife. And certain permissions and authorities

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that will allow the project to go forward, they will also be allowing this document to approve the project.

And we've already talked about the alternatives of the Clean Waters Act and the Rivers and Harbors Act and carrying out their decisions in a transparent way for the National Environmental Policy Act.

So a little bit more specifically about the Corps' role. We talked about 408 permission. What is 408 for? It's extremely important that if we look at what this project or any project within the system of what it might do, we need to evaluate what effect it might have upstream or downstream or adjacent in ensuring that the integrity and function of the Flood Control System as it was intended would continue in the future. And this particular action would not have any negative effects on that. It also ensures that the federal interest is maintained. And it ensures that the project is not injurious to the public. That's what the 408 process is for.

And then there are many factors that are looked at in 408. How is the levee proposed to be constructed? What are the methods to be proposed? What are the materials that we propose? Do they represent what we know today to be an appropriate flood risk reduction measure and comprise the system that we have to have higher level

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of confidence in?

So why hold this public meeting? Well, one, other than just the nuts and bolts of the environmental process, it's an opportunity to engage in the public. So you get an opportunity to hear what's being planned and how the designs are going to be progressing. It's an opportunity to directly provide input into that process to make sure that we have the record straight.

We have a good deal of knowledge and expertise on these resources, but that doesn't mean we know everything. So we very much are looking for your input to make sure the effective resources are described the right way. Whether that's on a property basis or recreation. I mean, there are a number of factors that provide the environment, and we want to make sure that we have those -- that context appropriately described.

But beyond the context, we also want to make sure that we have the effects themselves described. And that the significant criteria that then might trigger the need for mitigation. That all those things are appropriately and accurately described as they can be. And your input is very important to that.

So we talked about the public scoping meetings that were held in June of 2011. Two of them being right here in this room. That process, as well as the comments

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that were received thereafter, contributed to our understanding and knowledge that there are certain key issues that needed special attention within the document. Some of those are construction-related effects. And those are the things that would only occur temporarily while the project was being built. Such as noise that might be generated by construction equipment, or temporary affects on air quality. Either by equipment admissions or dust that would be generated by the project. Or from transportation and traffic effect. Because there might be temporary road closures, or we might expect to see that certain roadways would be subject to higher volume of traffic and materials that would be brought into the project. Or construction workers coming to and from the project.

In our afternoon meeting we have a representative from Sutter County Public Works. So we can talk more specifically about how we would like to see things both in the environmental document and construction specification. So that roadways are getting their proper due, or at least that we are able to disclose what the effects might be on those roadways that we have planned. So it was excellent to have his participation.

Another issue is river access for recreation, and how temporarily that's associated with the project. There

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may be loss of access localized in certain areas where on a public safety perspective, the levee might have to be closed because it's being actively worked on.

Vegetation removal is another issue that needs special attention. Because for the most part, over this 41-mile stretch, these levees are fairly compliant with the Corps and Levee Vegetation Policy. Which has been a subject of controversy. So the document addresses the different compliance mechanisms available in what this project contribution is towards that.

So those are some examples of some of the topics that are in the document.

So the comment period, it closes on February 13, 2013. And again, all comments received, there will be formal responses that are drafted. That doesn't mean it has to be a formal process. We're very welcomed to other ways that we can engage. So if you have other questions, comments that might not be officially through the record, we certainly want to hear them and work with you on that.

But for those comments that are officially submitted, there will be formal responses that will be published in the final environmental impact statement and environmental impact report and included as part of the record for the decision, that both the Corps of Engineers

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and Sutter Butte Flood Control Agency are making individually.

And the different ways that are available to comment: One, we can take them through e-mail. And the e-mail address is handwritten in red on the comment board up there. So if that's a preferred way to submit, then certainly we'll allow you to do that. And that's an address you can take down.

We also have these hardcopy comment cards which were likely distributed to you or pointed out back there at that table. We have additional comment cards up here as well. So you can either fill those out this evening and place them in one of the wire baskets, or give them to one of the members of the project team. And that's one way you can submit. Or you can choose to mail them in later. That's perfectly acceptable as well.

Not only that, but you don't have to use this form at all. If you would just choose to send in a letter, and send that to regular mail. The comment card is not required. It's whatever way you can best get out your thoughts. We'll accept those.

And also, again, Jillian is here to take any oral comments you might have. If you would like an opportunity to speak to somebody and have them formally captured in the record by a professional.

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So those are the mechanisms in which you can comment. And then if you want to mail or e-mail comments, I'll leave the slide up for the remainder of the presentation.

Jeff Koschak is the environmental lead for the U.S. Army Corps of Engineers and will be the official receiver of the comments. But you can give them to either the Corps of Engineers or the Sutter Butte Flood Control Agency who will be exchanging the comments in their entirety and working collaboratively to get out responses to those comments.

And then Ingrid Norgaard is also able to be contacted on behalf of the Sutter Butte Flood Control Agency.

So that's all we have in terms of the more formalized presentation. At this point what we'd like to do is if you do have questions or comments that you would like to talk about as a group, that's what we're here for.

What we ask that you do is that if you can stand up and also say your name, because we want Jillian to be able to hear you. And we all want to be able to hear you and be able to record your name. And then if you have individual comments that you choose not to share with the entire group or are very site-specific issues, then we have the members of the design team.

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We have copies of the map books available. And what the map books are is they are excerpts from the environmental document. That if you want to look at the environmental footprint or if you want to look -- they don't have boundaries. But you can probably do a pretty good job of finding a spot. So we can talk individually about those issues using the map books.

So at this point the meeting is yours. And we're available for your questions and comments.

Would somebody like to go first?

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PH2-H1

FRANK McCARLEY: Frank McCarley, I live on Second Street. I'd like to know what you do with all the homes on Second Street.

MR. ELLIOTT: The question is about the homes that are right along Second Street and what the proposal is there.

So, Barry, from overseeing the real estate activities?

MR. O'REGAN: So on Second Street, those are existing slurry walls. So we're not proposing those. So on Second Street there's an existing slurry wall through the levee there. And that's specifically Second Street. So we're not proposing work near the homes on Second Street because of the wall. However, one thing we do have to do is we have to make sure that if there are structures built into the levee, that they do not impact the integrity of them. So we have to evaluate whether or not a structure dilutes the levee over the years or impacts the ability that is performed during the flood.

But based on what we can tell from here is there's approximately four structures that could be along Second Street. So we will have to talk to those property owners and get our engineers in the field and talk to those property owners and make a determination on whether or not those structures impact the integrity.

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PH2-H2

FRANK McCARLEY: Originally they did not. The dirt from the levees actually -- I got one of them. And they actually pushed them against our building because the Levee District does not take care of any that come off the levee at all.

MR. O'REGAN: So our focus right now is not on the structures. Our focus is getting slurry walls in place. Because that's what the high risk is. But we will be coming back and looking at things like, we have upstream, we have berms in the levee, we're working with those property owners doing evaluation, figuring out where the levee was originally and where they are now, and making a determination whether or not that structure presents a risk. And if it does, then we'll get the next step and see what has to happen.

There is one structure on Second Street, the Commons building. That is our engineers have looked at that structure on the levee, and they've determined that is an integrity issue. And the work we're proposing to undertake in 2013, that will be it. On the private property on Second Street, we're not proposing any work this year. But we will be evaluating those structures -- and we've seen four -- as best we can tell, whether or not they propose a levee integrity issue.

So I'll be over here. I have a map that shows it

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in a little better detail.

MR. ELLIOTT: Next question or comment?

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PH2-I1

FRANK COATS: Hello, I'm Frank Coats. And I came to the scoping meeting a year and a half ago and made comments that are similar to what I wanted to make now.

My particular concern is recreational access to the river. The California law for general public is that they have a right to be on the river and on the banks of the river up to the high water mark. Wherever the river standby applies small craft. So throughout this levee project, all the banks of the river up to their high water mark are public use area or public resource, where the public already had a right to use. And we are.

And also there's something called Public Trust Document. Which basically says that public agencies like Sutter Butte Flood Control Agency or Department of Water Resources or our local levee districts or our counties or our cities shouldn't be involved in unnecessary, unjustified harm to trust interests. And that the trust is applied more stringently in the context of a magnitude servitude, the right to be on the river and banks of the river than it is even on water level.

The -- I guess I don't want to bore people to death. The other important thing to realize is the report indicates that access to the river is very restricted, especially north of Yuba City. But access to the levees was restricted by the Levee District and levee maintenance

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PH2-I1

organizations. Restricted by public agencies who are locking gates and selling gates and locking the public from getting across the levee to the river. And the public has as much right to be in the river as anybody. They have a right to be on the banks of the river. And the counties and city should not be bringing themselves in the position of potential dispute between landowners the river bottoms and the general public.

And incidentally, I haven't said anything about the levees or the design of the levees or the safety of the levees or anything like that. I'd be very happy to see this project get started right away, as soon as possible. My house is as much as risk as anybody's.

But I'm suggesting something that doesn't have anything to do with integrity of the levees. I'm suggesting levee districts and Sutter Butte Flood Control Agency don't have any business blocking the public from access to the river.

And my comments go on the record. But I think that's enough. Thank you.

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PH2-H3

PH2-H4

FRANK McCARLEY: He brought up a good point. We own the water mark on Second Street. And we have a problem right now with security. The Levee District has not -- all our houses are getting broken into. And the house I live in got broken into twice in December.

So with the trucks going up and down on the levee and the gates being opened, because we have such a large amount of homeless or people living in the river bottoms right now, that's going to be moving up to our houses. So are you guys going to take care of that?

MR. BESSETTE: Well, that's a good comment. As part of construction, we'll have construction managers on site whenever the activities -- construction activities are occurring. So we'll have to work with the local property owners in the Levee District to understand what the problems are with either homeless communities or other people who were maybe trespassing on certain properties and try to ensure that those are limited.

When construction is occurring, that tends to disburse homeless camps and others like that. So that is a good thing from your perspective.

FRANK McCARLEY: No one patrols the levee for that down the water. So the construction, I'm okay with. It's at five o'clock when they're done, you're going to have this -- when the lights go down at night our levee is

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PH2-H4

full of people walking back and forth.

MR. BESSETTE: Well, we have construction fencing up also. Our activities are going to go past five o'clock. A lot of our work is going to be very long days and into the evening hours. So it's going to be continuous activities. We need to get in and get these projects done to get the protection that this community needs and get in and have these projects completed.

So what I'd like to do is pass on these comments to the Levee District in your area. And it may help to talk to the law enforcement also. But really our project is building the levees.

PH2-H5

FRANK McCARLEY: My next question is since we're going to have trucks going up and down the levee right there, some of these homes are almost 200 years old. And they won't take a lot of vibration. I mean, they're set on red brick foundations and they're not tight.

MR. BESSETTE: What we do in cases like that, we'll take pre-construction photos. We'll work with the landowners if they allow us to go inside and also take photographs, so that we can show that if our construction activities do damage to those homes, that we would take care of that.

PH2-H5 cont'd

FRANK McCARLEY: Our family has three houses there. So it's --

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PH2-H6

MR. O'REGAN: When they did the slurry wall before did you have issues with the grounds then?

FRANK McCARLEY: Yes. All the houses cracked. We bought our house right after that and the stress that was in the house. So yeah, all the houses were stressed. They all relieved. Grounds kind of relaxed, and so the houses moved, some of them.

MR. O'REGAN: That's good to know. Thank you.

FRANK McCARLEY: It is what it is.

MR. ELLIOTT: Next question?

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PH2-I1

LAWRENCE BURNS: I live in Yuba City. One of the things that really helped District 1 as far as levee maintenance was getting tours of people down to see the construction that went along, showing the deficiency of the levee, raising public awareness of the problems that are there.

Everything north of Yuba City is almost like a mystery. You can't see it, you can't inspect it, you can't look at it. Locked gates everywhere. It would be really nice if there was some kind of public relations program to show the citizens what's going on. You get a lot more public support that way.

MR. INAMINE: That's a good comment. The Assessment District has been passed with a lot of public outreach in the work we're going to be undertaking beginning this summer. We don't want to create any illusion that it's not going to create a lot of distress. There's going to be destruction of people's lives. There is going to be issues we're going to have to handle on a case-by-case basis with property owners. Some of the issues that you said, like security and homes and other structures.

And so your point is well taken that more public outreach should be done to let people know why we're doing what we're doing and how we're doing it. That's our

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charge. That work is planned for 2013. We have a lot of time to do that.

MR. ELLIOTT: Next comment or question?

JED (?): If I can speak about the vibration thing. With potential vibration damage for historic structures, which most of those houses on Second Street are, and we typically have an analysis done beforehand to determine based on the types of construction that are going to occur, the distance at which vibration damage would be expected, and typically if there are structures in that area that might be sensitive to it. Based on that, there's a Cal Trans manual that looks at different structure types and their sensitivity to vibration, including foundation types. And those will be required through the National Historic Preservation Act to monitor for vibration to ensure these damages don't occur.

So in addition to just the project concern with damaging people's houses, there's another law that's going to be on your side as well. And we'll be making the point to make sure that there isn't any damage to those structures. And they -- if you look in the EIS, that area has been noted as an area of historical significance already. So we're working on it.

MR. ELLIOTT: Thank you, Jed.

Next question or comment?

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PH2-K1

UNIDENTIFIED MALE FROM AUDIENCE: The construction of levees magnitude is going to take a lot of trucks carrying a lot of gravel, and so it doesn't disrupt construction process, are going to do a job on the roads. And these roads in the Sutter County -- let's say they're old.

MR. BESSETTE: We're in the process of identifying our borrowed sources for the project. Once those sources are identified, we'll identify the haul routes to the familiar project sites. But we're going to be working closely with Sutter County, Yuba City on identifying which haul roads they want us to utilize, what the condition of those roads are, characterizing them and going back and looking at how they survive throughout the construction and what needs to be done once they're restored.

MR. ELLIOTT: Next question or comment?

So again, we have members of the private team here. We have map books. If you have any questions or any comments, that's what we're here for.

We have one more over here.

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PH2-L1

VICKI STEVENSON: I used to work in Sutter County. The Levee District -- as we are taxed on that already, which keeps going up. And we looked at our tax bill this year. We had more Levee District taxes added to our tax bill. How much more are you going to keep taxing us on a project that is not getting completed? And all you're doing is having these studies, which cost more money to us as property owners?

I mean, we are taxed on top of tax. And you're not getting anywhere. I retired at a tax collector's office twelve years ago, and this was talked about back then. Nothing has been accomplished. And you just keep raising our taxes a little bit more. And look at the average age in this audience. A lot of people are upside down in their homes. They can't keep affording these taxes. And you're not getting anything accomplished.

I was raised over in Humboldt County and survived a flood over there. We never had -- and environmentalists are killing people. You got this little fish or little bug or this and that. You're always going to have a bug or fish or something that no one wants to hurt. Well, I'm sorry. Life is life. If you're going to save lives, do it and do it right. And you're killing people.

MR. BESSETTE: Let me address your comment about we're not getting anything done. When the assessment was

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passed in 2010, I believe it was talked about having construction started in 2013. We're now in 2013, and we're going onto bid in March. So in two months we're going to be going out to bid on our first project, a 15-mile project. And we're going to start construction this summer.

So I think progress is being made. We're going to be in construction this year. It's going to take about two years to complete that project. At the same time we're going to be going out to bid on the north levees, north of Live Oak in early 2014. So we'll be out in construction on that project in 2014. So you're going to see a lot of construction happening as promised.

VICKI STEVENSON: Well, not only that, okay, FEMA -- good ol' FEMA -- has gone in and assessed certain areas to be a flood zone. We're south of Bogue Road. Right in the prime. We didn't get flood until three days later after the '55 flood. Because it was backed up in

PH2-L2

southern Sutter County. And the rates that they're charging is just -- I mean, if you've got a barn, it's not worth anything. That costs you more than your damn home. There's no justification for the revalue of what they're charging for what the progress of the project is doing for us, is what I'm trying to say.

MR. INAMINE: Let me address -- well, first of

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all, let me recognize -- and I certainly understand your frustration. So let me point out, I'm not going to -- I'm going to try to say this without sounding defensive. But the whole reason that this project was strategized, and the way it was funded, and the way that the state came in with fund projects like this is because the Flood Control Agency was organized in 2007 because of the frustration waiting for federal feasibility study and authorization, procreation, design construction. And it started in 2000.

By 2000 people like yourself were tired of that, of waiting. And then in 2010 when the assessment was passed, that was passed with an eye towards leveraging bond money to have state local sort of put themes and do it before the Corps of Engineers. Because of the fact that federal process was made so long.

I don't want to discount the Corps of Engineers process. That's an important process for us. But the whole point of this project, the way the whole strategy behind it is it was a funded project, we did it as fast as we could, 2010. The legislation was passed, getting construction in 2013, being able to meet those deadlines. We have some big issues before we get into construction in 2013. I do not want to dispel -- I don't want to paint a rowdy picture. We've got this big obstacle for 2013. So far we've been able to keep those promises. It's our

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intention to advance this construction that was done in 2010, '13 through '15, to get all of these structures, get all these levees improved for all 41 miles.

And the FEMA issues is one of the drivers for this, right? Because you have essentially three areas, FEMA zones from the Butte County north of their map, flood insurance in the middle between roughly Steward Road and Butte County line. So far they have not been mapped in. FEMA wants to, because they don't -- we don't have 100-year flood protection right now. We don't. We haven't had it for a long time. It's been recognized for years now, but we don't have 100-year flood protection. We're withstanding. We've been meeting with FEMA both here and in Butte City saying, "Don't map this in the flood plan." If you do that, you're going to have to go back a couple years from now in 2016 and take it out of the floods plan, because we have construction. We're not just talking at you. We've passed an assessment, we've got state money, and we're going to go to town here in 2013. So that so far has been effective.

Now, south -- you're absolutely right. I don't want to discount that. South is a problem. Because that was already mapped into the flood line.

PH2-L3

VICKI STEVENSON: Well, between Natomas and Sacramento to there, they're having the same problem.

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PH2-L3

They can't build because of the flood plane. And that's nuts.

MR. INAMINE: So I don't know where your home is exactly, but it's our intention to go as far as south as possible. Now, I said that -- for example, the Corps feasibility study is important to us. That's also a project that is our fast track. And that extends the project further south. And we have money to go to do with the state. State sort of parcelled out their money. And we're subject to sort of the way they fund projects.

Now, the Corps feasibility study, if things go through as planned, is going to extend the project further south. That will affect where you are. That's a good thing. That will allow us to stand our project and stand state-funded project advancement. And that would directly affect you. And depending on where your property is, that will drop out high flood insurance rates that you're probably paying right now.

And again, for the record, regardless of whether you have 100 to 200 federal interest level of flood protection, everybody needs to have flood insurance. You're going to pay much lower rates if you have strength in levees like the ones we're proposing in this presentation.

But absolutely, south part of the basin, that's

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tough. It's very difficult. Flood insurance, higher rates. And you're subject to the restrictions of farms and another front or even a house that burns down.

So on another front, the agencies is taking a part in new legislation that would relax FEMA restrictions for some of those issues I just named in agricultural areas, like, I think about where you live. So that's a separate track. This new FEMA ag zone. But we do have a lot of support from our congressional and working with the collation to advance that legislation through Congress, because it just doesn't make sense.

VICKI STEVENSON: I know a fella that had a home that caught on fire. And it's in a flood zone. It was two years from the property being paid off. And of course you couldn't rebuild.

PH2-L4

MR. INAMINE: Right. And he lost a big percent of the value. And unless you build a house 25 feet high, you can't --

VICKI STEVENSON: Yeah. And he was in our age group. And that's devastating to people that have been in these homes for all their lives.

PH2-L5

MR. INAMINE: So it's -- there are two tracks -- probably three tracks to addressing those issues. One is improvements obviously get to a higher level of publication. So those restrictions will go away.

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There is the Corps feasibility study which is also a measure. But we're going to have to wait a little bit longer. But that's also an avenue flood protection that will make those restrictions go away. And then there's a federal legislation. And you'll oversee that as well.

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PH2-M1

UNIDENTIFIED MALE FROM AUDIENCE: Do you have to mitigate for this project off site?

MR. ELLIOTT: Do you mean -- what type of mitigation do you mean?

UNIDENTIFIED MALE FROM AUDIENCE: Fish and game.

MR. ELLIOTT: Yes. Right now we're still in the process of finalizing what those effects might be and the mitigations necessary. But in terms of fish and wildlife, there is a surplus area available at the restoration site that was created by the Star Bend setback. And right now it's looking like the math is very close. That any of the projects needs would fit there. And that is the primary place being looked at.

Any additional mitigation needs that that site might not be able to fulfill, either because there's not quite an area needed or it's not quite the right habitat type, the most likely answer is that it would be a very small additional increment. And that would be through credits like litigation bank most likely.

MR. INAMINE: And also I'm hearing a concern about mitigation, additional property part of mitigation. We have a cooperative agreement with the River Levee Improvement Agency across the river to use some of their area that's already been behind the setback of mitigation for our work as well. So I mean, it's going to minimize.

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PH2-M2

UNIDENTIFIED MALE FROM AUDIENCE: Well, between Bear River and Yuba River, it has been a lot. It's about 1,800 acres. That's a lot.

And by the way, for all you guys here in Yuba City, you should go and thank Yuba County. They moved the levees back. And in case of a flood event, the water on the levee will not be as high as they used to be. Because that's a choke point. That's why they moved the whole levee back. So there's another -- the Bear River and the Feather River, so there's another eighteen, sixteen hundred acres. That's a lot for Yuba City. Until we get our levees taken care of. It's a good thing.

MR. ELLIOTT: Other questions or comments?

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PH2-N1

UNIDENTIFIED FEMALE FROM AUDIENCE: I just have a quick question. The bugs and shrubs, how much money do we spend? How much time has been delayed over the issue of the elderberry beetle and all these other animals that are more important than my property and my children and grandchildren?

MR. ELLIOTT: Are you asking if the project got delayed because of those environmental issues?

PH2-N1 cont'd

UNIDENTIFIED FEMALE FROM AUDIENCE: Absolutely. Back in '86 I lost the ranch and leverage because they wouldn't let me go back and rescue them. And it was just because elderberry beetle was a lot more important than us.

And I know all these studies -- this is ridiculous. It seems to me to have a dictator say, "Okay. All this crap is extended. You're going to help protect and build people's property."

MR. ELLIOTT: At this point what I can tell you, and I definitely empathize with your concern, there has not been a project delayed that has been with environmental issues.

In terms of planning that have incurred to come up with best measures available to address the deficiencies in terms of the engineering studies that need to go way to look at the voracity of that plan and make

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sure that it is meeting standards. And then the property acquisition process, environmental list is going along in parallel with all of these things in this point, all converging, and will hopefully get construction started in 2013. At this point, environmental causes have not been a result of any scheduling delay.

PH2-N2

UNIDENTIFIED FEMALE FROM AUDIENCE: And that's just for the current homes?

MR. ELLIOTT: Yes.

Other questions or comments?

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UNIDENTIFIED MALE FROM AUDIENCE: Since you are enforcing the levees from Thermalito all the way down to where joint of Sacramento River, has the river been -- is there overflow areas being designed? Because the further downstream you get the more water there is. And I know it's a river. It looks like the same width as Thermalito as it is down in Sacramento back south.

I think that's what the gentleman mentioned earlier, that south of Marysville, so it is wider.

MR. BESSETTE: That is true. And this project did look at alternatives such as setback levees. And those will not be equal for you because they take up a lot of land and impact by doing that. We're going to be reenforcing our levees in place by installing slurry walls. And basically that's the predominant feature.

UNIDENTIFIED MALE FROM AUDIENCE: Are any levees going to be moved because of restrictions on the river?

MR. BESSETTE: No, not as part of this project. Further downstream they are looking further down from our project. When you get to the confluence of the Sutter Bypass there is an idea alternative of a setback levee in that area. And that'll be studied in the future. But our project is not setting back levees.

But you mentioned across the river, Yuba and Trilia (phonetic) have setback levees in those areas.

PH2-O1

PH2-P1

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That does help widen out the flood plan for both sides, too.

PH2-P2

UNIDENTIFIED MALE FROM AUDIENCE: Is there any provisions made to increase the river flow capacity by removing some of the snags?

MR. BESSETTE: This project will not be doing that. There's other studies like Feather River Corps Management Plan that's looking at removing some obstructions within the river. But that alone will not alleviate the desire or the need for our project to move forward.

MR. INAMINE: Even if we make those improvements, you still have deep under-seepage issues. And there's the same water surface elevations that will create the same flood problems we've discussed. So we still have to fix the levees.

And the issues also with sediment, we talked about hydraulic mining and some of the controversies associated with dredging. And that's very expensive. And I don't know how to tell you about the environmental issues associated with habitat. But a lot of that sediment is still moving down the system. So we clear it out, and it's replaced. But there's still remnants of the old hydraulic mining. And it comes back. So regardless, we've got to fix the levees for under-seepage.

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PH2-Q1

ROY STEVENSON: I was born and raised here. I live in the same -- my name is Roy Stevenson. And I went through '55. And I was a farmer in my younger years. Forty years with PG&E. But I don't know how many farmers we've got in here a whole bit, but you can't run water through a dirty ditch. All the orchards and everything else is planted in these rivers, they're going to have to take them out. I'm sorry. I'm with the farmers and all that, but they're going to have to go to seasonal crop farming.

Get those trees out. It's like putting a cork in a bottle. You run out of water down here and it hits these trees, it backs up. There's your levee problem. Dredge the damn river, get the God-dang rivers clean like they're supposed to be. Like they used to be. And your water will go down the river and go on out.

But until you can control that part, you ain't going to control nothing. And the environment is going to stop you every time you turn around. So that's the whole bit. You have to clean the damn rivers and you'll take care of your problem. These levees have held for many years. And you people all think you have a bright idea, "We can slurry these walls. We can do this. We can do that." But you still have the cork in the bottle. It's going to run over the top.

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PH2-Q1

I saw the water in '55. It was running over the top of the levee. It wasn't going through the side, it wasn't going anywhere else. It was going over the top of the damn thing until it finally broke. They turn around and make Shanghai Bend. That was going to solve all our flood problems. So we had the water coming in and hitting the direct levee. They straightened it out, now I understand they're going to carry out and work on it again.

So what good did that do? Not a damn thing. And you people all want to sit around here and play this game and use up all this money that we're going to have for studies and all this other crap, and you don't do a damn thing about it. The third bridge is never going to be built in our lifetimes. The reason is they've kept studying all the times, they've used up all the money for the third bridge. So we're all right back where we started. All this is just a bunch of bureaucracy bull crap that's going to God dang waste nothing except our money and our time.

If I could get out of my place, I'd get the Sam hell out of Sutter County. I can tell you that.

MR. ELLIOTT: Other comments or questions?

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PH2-R1

UNIDENTIFIED FEMALE FROM AUDIENCE: I have a question. The dredging -- I've been to different groups and all that. We've been talking about it for years. Have you guys actually looked at the dredging? There's lots of private companies that would love to do it. Our taxpayer dollars could take care of the problem.

ROY STEVENSON: Even back when my father was alive they wanted to dredge the rivers. Put it along the banks. It's probably not the right stuff, but at least you got a river bank down where it used to be. Not higher than the land on the outside.

PH2-Q2

You can hardly run a boat down Feather River or Sacramento. With debris and everything that's in the river, you can't get a boat through there. They used to run a barge up Colusa. You couldn't even begin to get a barge up in Colusa now.

But what have we done? We've done it to ourselves. We've let the environmentalist people tell us what we can do to protect lives and save property because they don't want to kill some stupid bug.

MR. INAMINE: Well, there's a lot there. There's a lot there. And there's a lot of political philosophy I can't even begin to address.

Let's talk about dredging and levees. Since 1907, if you discount all the over topic failures where

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water comes over the top, there's been at least seven failures of where the water is not even come close to where these levees were authorized to operate. So they're supposed to operate at a certain level of operation. State locals, they said your levee is supposed to operate. And they've done it seven times. Discount the other overtopping failures over the top. Seven times we've had failure of the levee.

It didn't come up to that it didn't perform to what it was supposed to do. And 1955 is one of the those failures. In most cases it came underneath the levee and blew the levee out. And the thing about those type of failures the under-seepage failure is they only blow out when the water was very high and they fail catastrophically. And I had personally seen levees that have undergone under-seepage and knocked on people's door to get the hell out of Dodge. Because it's a very scary thing when the water gets up very high. And that's what contributed to -- that's what generally contributes to loss of life is deep under-seepage.

I understand your point about dredging. It sounds like -- so dredging, taking the volume out between the channels to provide more conveyance, absolutely. That works in lots of cases. Taking out trees and snags, in many cases that works. And we've looked at that. And

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again, in a perfect world, if we could do that, we'd still have an issue with deep under-seepage. That's contributed to at least seven failures through the levee or under the levee. It just means you had a really lousy levee on a really lousy foundation, and the levee blew out, and in some cases people died. And we're trying to address that issue.

And dredging, environmental issue, yeah, that's a problem. And that's the legal infrastructure we live in. I can't begin to address that. We're just trying to address the highest risk failure mode right now that we can do with the available money that we have.

Over the long term there is a study -- again, another study, and I understand the frustration of studies -- that's looking at dredging another time. But it really doesn't affect what we're doing. We have to fix these levees right now in the places we know they're going to break.

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PH2-S1

FRANK McCARLEY: Can I ask another question?

Are local contractors going to do this or is it going -- since we have an economic slow down in this area for local --

MR. ELLIOTT: The question from Frank McCarley is whether the work will be done by local contractors.

MR. INAMINE: Tomorrow there is a contractors outreach right here in Yuba City to invite contractors, and obviously there's interest to invite local contractors, to submit this on this contract. Now, we're a public agency, we are -- it's in our charge to get as much work with the lowest price. And there's only so many things we can do to facilitate local construction. But we're very fortunate in this area that there's a couple of very confident contractors that -- through that have been tracking this project. And we've been talking to them. So we expect they'll be a lot more participation in this project. It's well suited for construction companies.

MR. BESSETTE: I think Mike covered it. We're following the Public Contract Code, we're holding a contract outreach program tomorrow. We've invited -- we're going to get a packed house over at Yuba City Counsel Chambers tomorrow morning. But it could go to an outside, out of the area, out of the state contractor. It's whoever has the best price for the work. And we're

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all paying money to contribute to this. So we want to get the biggest bang for our buck. And that's how it's going to be.

But we are going to promote local contractors, local vendors, local material providers. We're going to try to get the word out so that any contractor who gets our project tries to utilize local services as much as possible. So that's what our Board of Directors has sort of mandated.

PH2-T1 UNIDENTIFIED MALE FROM AUDIENCE: Do you have a solicitation document out so people can see?

MR. BESSETTE: No. We'll be out to bid in March, so we'll be entering our bid documents. And I believe March 18th is when we should be out to bid formally on the first project.

PH2-T2 UNIDENTIFIED MALE FROM AUDIENCE: Will you put that out so public can see it?

MR. BESSETTE: Yes. It will be advertised in the newspaper, and it'll be on our Web site. We want to get the word out as much as possible.

PH2-U1 UNIDENTIFIED FEMALE FROM AUDIENCE: Were there any Web sites (inaudible) and veterans on it?

MR. BESSETTE: No, there's not. We're following Public Contract Code. And it's not like DVD or any advantage like that where some federal contracts have

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that. Ours does not.

ANDREW: (Inaudible) and low price down at Nicholaus, they must have had a good price. And the guy

PH2-V1

crapped out. So whoever got a good deal, really didn't get a good deal. So how do you figure the lowest price when they come in low and then say, "Oops, we can't do it." How do you check them?

MR. BESSETTE: This is going to be a very large contract. It's approximately a 50-million dollar contract. We're going to have to have contractors who can bond to those amounts. We have -- it's part of our bid process, they have to show that they have done many projects like ours in the past. We'll be checking on that. So they have to be qualified to do the work. So we would investigate that as part of our process.

But it's going to be big -- pretty good-size contractor to be able to handle a job like ours.

PH2-V2

ANDREW: One company or several?

MR. BESSETTE: I would assume there will be a prime with subcontractors as part of their team.

PH2-V3

ANDREW: Does anybody check on subcontractors?

MR. BESSETTE: We check on everybody. They have to submit qualifications for all the subcontractors up to half a percent of the work. So we're going to be seeing who those subs are, and we'll evaluate those.

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MR. ELLIOTT: Is there a final question or comment?

And after this we'll be able available to take people's questions and comments.

(Thereupon the meeting adjourned at 7:39 p.m.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss
COUNTY OF SACRAMENTO)

I, JILLIAN M. BASSETT, a Certified Shorthand Reporter, licensed by the state of California and empowered to administer oaths and affirmations pursuant to Section 2093 (b) of the Code of Civil Procedure, do hereby certify:

The said proceedings were recorded stenographically by me and were thereafter transcribed under my direction via computer-assisted transcription;

That the foregoing transcript is a true record of the proceedings which then and there took place;

That I am a disinterested person to said action.

IN WITNESS WHEREOF, I have subscribed my name on February 4, 2013.

_____
JILLIAN M. BASSETT
Certified Shorthand Reporter No. 13619

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Response to PH2-H, Frank McCarley

PH2-H1

On Second Street, those are existing slurry walls. We're not proposing those. On Second Street there's an existing slurry wall through the levee there. And that's specifically Second Street. We're not proposing work near the homes on Second Street because of the wall. However, one thing we do have to do is we have to make sure that if there are structures built into the levee, that they do not impact the integrity of them. So we have to evaluate whether or not a structure dilutes the levee over the years or impacts the ability that is performed during the flood. But based on what we can tell from here is there are approximately four structures that could be along Second Street. So we will have to talk to those property owners and get our engineers in the field and talk to those property owners and make a determination on whether or not those structures impact the integrity. Comment did not necessitate change to the Final EIS.

PH2-H2

So our focus right now is not on the structures. Our focus is getting stair walls in place, because that's what the high risk is. But we will be coming back and looking at things like, we have upstream, we have berms in the levee. We're working with those property owners doing evaluation, figuring out where the levee was originally and where they are now, and making a determination whether or not that structure presents a risk, and if it does, then we'll get the next step and see what has to happen. There is one structure on Second Street, the Commons building. That is our engineers have looked at that structure on the levee, and they've determined that is an integrity issue, and the work we're proposing to undertake in 2013, that will be it. On the private property on Second Street, we're not proposing any work this year. But we will be evaluating those structures, and we've seen four, as best we can tell, whether or not they propose a levee integrity issue. Comment did not necessitate change to the Final EIS.

PH2-H3

Well, that's a good comment. As part of construction, we'll have construction managers on site whenever the activities—construction activities are occurring. So we'll have to work with the local property owners in the Levee District to understand what the problems are with either homeless communities or other people who were maybe trespassing on certain properties and try to ensure that those are limited. When construction is occurring, that tends to disburse homeless camps and others like that. So that is a good thing from your perspective. Comment did not necessitate change to the Final EIS.

PH2-H4

Well, we have construction fencing up also. Our activities are going to go past five o'clock. A lot of our work is going to be very long days and into the evening hours. So it's going to be continuous activities. We need to get in and get these projects done to get the protection that this community needs and get in and have these projects completed. So what I'd like to do is pass on these comments to the Levee District in your area. And it may help to talk to the law enforcement also. But really our project is building the levees. Comment did not necessitate change to the Final EIS.

PH2-H5

What we do in cases like that, we'll take pre-construction photos. We'll work with the landowners if they allow us to go inside and also take photographs, so that we can show that if our construction activities do damage to those homes that we would take care of that. Comment did not necessitate change to the Final EIS.

PH2-H6

That's good to know. Thank you. Comment did not necessitate change to the Final EIS.

Response to PH2-I, Frank Coats

Thank you for your comment. Comment did not necessitate change to the Final EIS.

Response to PH2-J, Lawrence Burns

PH2-J1

The Assessment District has been passed with a lot of public outreach in the work we're going to be under taking beginning this summer. We don't want to create any illusion that it's not going to create a lot of distress. There's going to be destruction of people's lives. There is going to be issues we're going to have to handle on a case-by-case basis with property owners. Some of the issues that you said, like security and homes and other structures. And so your point is well taken that more public outreach should be done to let people know why we're doing what we're doing and how we're doing it. That's our charge. That work is planned for 2013. We have a lot of time to do that. Comment did not necessitate change to the Final EIS.

Response to PH2-K, Unidentified Male

PH2-K1

We're in the process of identifying our borrowed sources for the project. Once those sources are identified, we'll identify the haul routes to the familiar project sites. But we're going to be working closely with Sutter County, Yuba City on identifying which haul roads they want us to utilize, what the condition of those roads are, characterizing them and going back and looking at how they survive throughout the construction and what needs to be done once they're restored. Comment did not necessitate change to the Final EIS.

Response to PH2-L, Vicki Stevenson

PH2-L1

Let me address your comment about we're not getting anything done. When the assessment was passed in 2010, I believe it was talked about having construction started in 2013. We're now in 2013, and we're going onto bid in March. So in two months we're going to be going out to bid on our first project, a 15-mile project. And we're going to start construction this summer. So I think progress is being made. We're going to be in construction this year. It's going to take about two years to complete that project. At the same time we're going to be going out to bid on the north levees, north of Live Oak in early 2014. So we'll be out in construction on that project in 2014. So

you're going to see a lot of construction happening as promised. Comment did not necessitate change to the Final EIS.

PH2-L2

So let me point out, and I'm going to try to say this without sounding defensive, but the whole reason that this project was strategized, and the way it was funded, and the way that the state came in with fund projects like this is because the Flood Control Agency was organized in 2007 because of the frustration waiting for federal feasibility study and authorization, procreation, design construction. And it started in 2000.

By 2000 people like yourself were tired of that, of waiting. And then in 2010 when the assessment was passed, that was passed with an eye towards leveraging bond money to have state local sort of put themes and do it before the USACE. Because of the fact that federal process was made so long.

I don't want to discount the USACE's process. That's an important process for us. But the whole point of this project, the way the whole strategy behind it is it was a funded project; we did it as fast as we could, 2010. The legislation was passed, getting construction in 2013, being able to meet those deadlines. We have some big issues before we get into construction in 2013. I do not want to dispel—I don't want to paint a rowdy picture. We've got this big obstacle for 2013. So far we've been able to keep those promises. It's our intention to advance this construction that was done in 2010, 2013 through 2015, to get all of these structures, get all these levees improved for all 41 miles.

The Federal Emergency Management Agency (FEMA) issues are one of the drivers for this, right? Because you have essentially three areas, FEMA zones from the Butte County north of their map, flood insurance in the middle between roughly Steward Road and Butte County line. So far they have not been mapped in. FEMA wants to, because we don't have 100-year flood protection right now. We don't. We haven't had it for a long time. It's been recognized for years now, but we don't have 100-year flood protection. We're withstanding. We've been meeting with FEMA both here and in Butte City saying, "Don't map this in the floodplain. "If you do that, you're going to have to go back a couple years from now in 2016 and take it out of the floodplain, because we have construction. We're not just talking at you. We've passed an assessment, we've got state money, and we're going to go to town here in 2013. So that so far has been effective.

Now, south—you're absolutely right. I don't want to discount that. South is a problem. Because that was already mapped into the flood line.

So I don't know where your home is exactly, but it's our intention to go as far as south as possible. Now, I said that, for example, the USACE's feasibility study is important to us. That's also a project that is our fast track, and that extends the project further south, and we have money to go to do with the state sort of parceled out their money. We're subject to sort of the way they fund projects. Now, the USACE's feasibility study, if things go through as planned, is going to extend the project further south. That will affect where you are. That's a good thing. That will allow us to stand our project and stand state-funded project advancement, and that would directly affect you. Depending on where your property is, that will drop out high flood insurance rates that you're probably paying right now. And again, for the record, regardless of whether you have 100 to 200 federal interest level of flood protection, everybody needs to have flood insurance. You're going to pay much lower rates if you have strength in levees like the ones we're proposing in this presentation.

But absolutely, south part of the basin, that's tough. It's very difficult. Flood insurance, higher rates. And you're subject to the restrictions of farms and another front or even a house that burns down. So on another front, the agencies are taking part in new legislation that would relax FEMA restrictions for some of those issues I just named in agricultural areas, like, I think about where you live. So that's a separate track. This new FEMA ag zone. But we do have a lot of support from our congressional and working with the collation to advance that legislation through Congress, because it just doesn't make sense. Comment did not necessitate change to the Final EIS.

PH2-L3

So I don't know where your home is exactly, but it's our intention to go as far as south as possible. Now, I said that—for example, the USACE feasibility study is important to us. That's also a project that is our fast track. And that extends the project further south. And we have money to go to do with the state. State sort of parceled out their money. And we're subject to sort of the way they fund projects.

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PH2-L4

Right, and he lost a big percent of the value. Unless you build a house 25 feet high, you can't—Comment did not necessitate change to the Final EIS.

PH2-L5

So it's—there are two tracks—probably three tracks to addressing those issues. One is improvements obviously get to a higher level of publication. So those restrictions will go away. There is the USACE's feasibility study which is also a measure. But we're going to have to wait a little bit longer. But that's also an avenue flood protection that will make those restrictions go away. And then there's a federal legislation. And you'll oversee that as well. Comment did not necessitate change to the Final EIS.

Response to PH2-M, Unidentified Male

PH2-M1

Yes. Right now we're still in the process of finalizing what those effects might be and the mitigations necessary (see Appendix F.3). But in terms of fish and wild life, there is a surplus area available at the restoration site that was created by the Star Bend setback. And right now it's looking like the math is very close. That any of the projects needs would fit there. And that is the primary place being looked at.

Any additional mitigation needs that that site might not be able to fulfill, either because there's not quite an area needed or it's not quite the right habitat type, the most likely answer is that it would be a very small additional increment. And that would be through credits like litigation bank most likely.

And also I'm hearing a concern about mitigation, additional property part of mitigation. We have a cooperative agreement with the River Levee Improvement Agency a cross the river to use some of their area that's already been behind the set back of mitigation for our work as well. So I mean, it's going to minimize. Comment did not necessitate change to the Final EIS.

PH2-M2

And by the way, for all you guys here in Yuba City, you should go and thank Yuba County. They moved the levees back. And in case of a flood event, the water on the levee will not be as high as they used to be. Because that's a choke point. That's why they moved the whole levee back. So there's another—the Bear River and the Feather River, so there's another eighteen, sixteen hundred acres. That's a lot for Yuba City. Until we get our levees taken care of. It's a good thing. Comment did not necessitate change to the Final EIS.

Response to PH2-N, Unidentified Female

PH2-N1

At this point what I can tell you, and I definitely empathize with your concern, there has not been a project delayed that has been with environmental issues.

In terms of planning that has incurred to come up with best measures available to address the deficiencies in terms of the engineering studies that need to go way to look at the voracity of that plan and make sure that it is meeting standards. And then the property acquisition process, environmental list is going a long in parallel with all of these things in this point, all converging, and will hopefully get construction started in 2013. At this point, environmental causes have not been a result of any scheduling delay. Comment did not necessitate change to the Final EIS.

PH2-N2

Yes. Comment did not necessitate change to the Final EIS.

Response to PH2-O, Unidentified Male

PH2-O1

That is true. And this project did look at alternatives such as set back levees. And those will not be equal for you because they take up a lot of land and impact by doing that. We're going to be re enforcing our levees in place by installing slurry walls. And basically that's the predominant feature. Comment did not necessitate change to the Final EIS.

Response to PH2-P, Unidentified Male

PH2-P1

No, not as part of this project. Further downstream they are looking further down from our project. When you get to the confluence of the Sutter By pass there is an idea alternative of a setback levee in that area. And that'll be studied in the future. But our project is not setting back levees. But you mentioned a cross the river, Yuba and Trilia (phonetic [TRLIA?]) have setback levees in those areas. That does help widen out the flood plan for both sides, too.

Even if we make those improvements, you still have deep under- seepage issues. And there are the same water surface elevations that will create the same flood problems we've discussed. So we still have to fix the levees. And the issues also with sediment, we talked about hydraulic mining and some of the controversies associate d with dredging. And that's very expensive. And I don't know how to tell you about the environmental issues associated with habitat. But a lot of that sediment is still moving down the system. So we clear it out, and it's replaced. But there are still remnants of the old hydraulic mining. And it comes back. So regardless, we've got to fix the levees for under- seepage. Comment did not necessitate change to the Final EIS.

PH2-P2

This project will not be doing that. There's other studies like Feather River Corps Management Plan that's looking at removing some obstructions within the river. But that alone will not alleviate the desire or the need for our project to move forward.

Even if we make those improvements, you still have deep under- seepage issues. And there's the same water surface elevations that will create the same flood problems we've discussed. So we still have to fix the levees. And the issues also with sediment, we talked about hydraulic mining and some of the controversies associate d with dredging. And that's very expensive.

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Response to PH2-Q, Roy Stevenson

PH2-Q1

Thank you for your comment. Comment did not necessitate change to the Final EIS.

PH2-Q2

Thank you for your comment. Comment did not necessitate change to the Final EIS.

Response to PH2-R, Unidentified Female

PH2-R1

Since 1907, if you discount all the over topic failures where water comes over the top, there's been at least seven failures of where the water is not even come close to where these levees were authorized to operate. So they're supposed to operate at a certain level of operation. State locals, they said your levee is supposed to operate.

And they've done it seven times. Discount the other overtopping failures over the top. Seven times we've had failure of the levee. It didn't come up to that it didn't perform to what it was supposed to do. And 1955 is one of those failures. In most cases it came underneath the levee and blew the levee out. And the thing about those types of failures the under-seepage failure is they only blow out when the water was very high and they fail catastrophically. And I had personally seen levees that have undergone under-seepage and knocked on people's door to get the hell out of Dodge. Because it's a very scary thing when the water gets up very high. And that's what contributed to—that's what generally contributes to loss of life is deep under-seepage.

I understand your point about dredging. It sounds like—so dredging, taking the volume out between the channels to provide more conveyance, absolutely. That works in lots of cases. Taking out trees and snags, in many cases that works. And we've looked at that. And again, in a perfect world, if we could do that, we'd still have an issue with deep under-seepage. That's contributed to at least seven failures through the levee or under the levee. It just means you had a really lousy levee on a really lousy foundation, and the levee blew out, and in some cases people died. And we're trying to address that issue. And dredging, environmental issue, yeah, that's a problem. And that's the legal infrastructure we live in. I can't begin to address that. We're just trying to address the highest risk failure mode right now that we can do with the available money that we have. Over the long term there is a study—again another study, and I understand the frustration of studies—that's looking at dredging another time. But it really doesn't affect what we're doing. We have to fix these levees right now in the places we know they're going to break. Comment did not necessitate change to the Final EIS.

Response to PH2-S, Frank McCarley

PH2-S1

Tomorrow there is a contractors' outreach right here in Yuba City to invite contractors, and obviously there's interest to invite local contractors, to submit this on this contract. Now, we're a public agency, we are—it's in our charge to get as much work with the lowest price. And there are only so many things we can do to facilitate local construction. But we're very fortunate in this area that there are a couple of very confident contractors that—through that have been tracking this project. And we've been talking to them. So we expect they'll be a lot more participation in this project. It's well suited for construction companies.

We're following the Public Contract Code, we're holding a contract outreach program tomorrow. We've invited—we're going to get a packed house over at Yuba City Council Chambers tomorrow

morning. But it could go to an outside, out of the area, out of the state contractor. It's whoever has the best price for the work. And we're all paying money to contribute to this. So we want to get the biggest bang for our buck. And that's how it's going to be. But we are going to promote local contractors, local vendors, and local material providers. We're going to try to get the word out so that any contractor who gets our project tries to utilize local services as much as possible. So that's what our Board of Directors has sort of mandated. Comment did not necessitate change to the Final EIS.

Response to PH2-T, Unidentified Male

PH2-T1

No. We'll be out to bid in March, so we'll be entering our bid documents. And I believe March 18th is when we should be out to bid formally on the first project. Comment did not necessitate change to the Final EIS.

PH2-T2

Yes. It will be advertised in the newspaper, and it'll be on our Web site. We want to get the word out as much as possible. Comment did not necessitate change to the Final EIS.

Response to PH2-U, Unidentified Female

PH2-U1

No, there's not. We're following Public Contract Code. And it's not like DVD or any advantage like that where some federal contracts have that. Ours does not. Comment did not necessitate change to the Final EIS.

Response to PH2-V, Andrew (?)

PH2-V1

This is going to be a very large contract. It's approximately a 50-million dollar contract. We're going to have to have contractors who can bond to those amounts. It's part of our bid process, they have to show that they have done many projects like ours in the past. We'll be checking on that. So they have to be qualified to do the work. So we would investigate that as part of our process. But it's going to be big, a pretty good- size contractor to be able to handle a job like ours. Comment did not necessitate change to the Final EIS.

PH2-V2

I would assume there will be a prime with subcontractors as part of their team. Comment did not necessitate change to the Final EIS.

PH2-V3

We check on everybody. They have to submit qualifications for all the subcontractors up to half a percent of the work. So we're going to be seeing who those subs are, and we'll evaluate those. Comment did not necessitate change to the Final EIS.