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

REPLY TO
ATTENTION OF

Environmental Resources Branch

JAN 04 2013

TO ALL INTERESTED PARTIES:

Enclosed for your review are the Draft Interim Feasibility Study/Environmental Assessment/Initial Study (FS/EA/IS) and the Draft Finding of No Significant Impact (FONSI) for Orestimba Creek, West Stanislaus County, California. The study is a cooperative effort by the U.S. Army Corps of Engineers, the California Department of Water Resources, and Stanislaus County in order to comply with the requirements of the National Environmental Policy Act. This investigation is being conducted under the authority of the Flood Control Act of 1936 (Public Law 74-738).

The Draft Interim FS/EA/IS assesses the risk of flooding to the city of Newman and surrounding agricultural areas, describes a range of alternatives to reduce flood risk to the city of Newman and surrounding agricultural areas, and identifies a tentatively recommended plan for implementation. This document also describes the environmental resources in the project area; evaluates and provides full public disclosure of the direct, indirect, and cumulative environmental effects of the no-action plan and the tentatively recommended plan; and recommends avoidance, minimization, and mitigation measures. Potential effects that would result from the proposed alternatives would either be short term or would be avoided or reduced by using best management practices. Results of the evaluation indicate that the proposed alternatives would not result in significant effects on the human or biological environment. Based on these results, a Draft FONSI would be appropriate and is included with the Draft Interim FS/EA/IS.

The public review period for the Draft Interim FS/EA/IS will begin January 7, 2013 and end February 7, 2013. All comments received on the draft document will be considered and incorporated into the final document, as appropriate. Please send any comments, questions, or requests for copies to U.S. Army Corps of Engineers, Sacramento District, Attention: Ms. Robin Rosenau, Environmental Manager, 1325 J Street, Sacramento, California 95814. Ms. Rosenau may also be reached at (916) 557-5397 or by e-mail at Robin.M.Rosenau@usace.army.mil.

Sincerely,

E. Scott Clark

Alicia E. Kirchner
Chief, Planning Division

2013 JAN -8 P 1:26
BOARD OF SUPERVISORS

Orestimba Creek

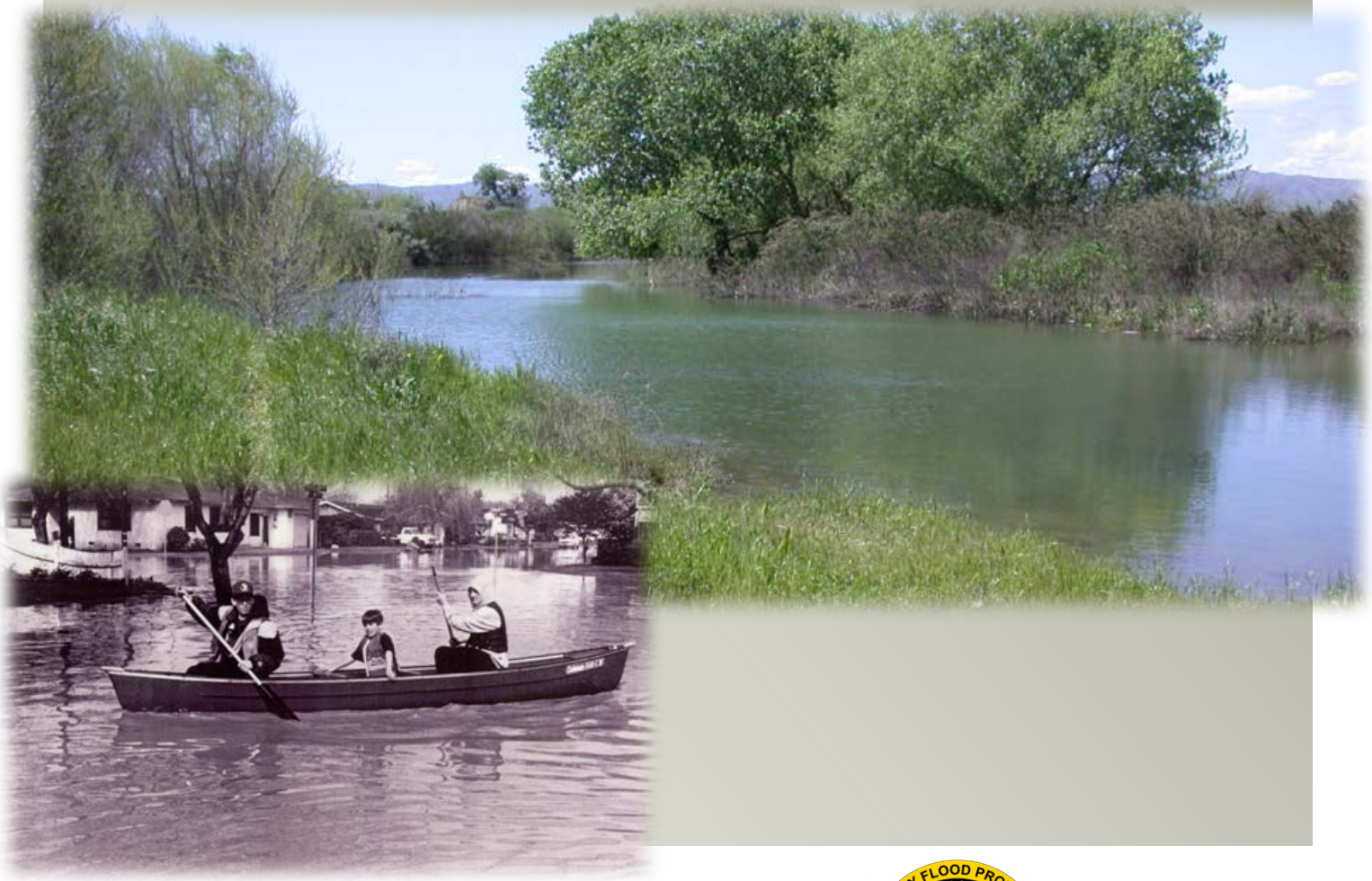
West Stanislaus County, California

Draft Report for Public Review

Draft Interim Feasibility Study

Draft EA/IS

December 2012



US Army Corps of Engineers ®
Sacramento District

Central Valley Flood Protection Board
Public Safety and Flood Management
State of California

Stanislaus County

SUMMARY

This report: (1) assesses the risk of flooding to the City of Newman and surrounding agricultural areas; (2) describes a range of alternatives to reduce flood risk to the City of Newman and surrounding agricultural areas; and (3) identifies a tentatively recommended plan (TRP) recommended plan for implementation. This report constitutes both a Feasibility Report, that describes the planning process followed to identify the Federal interest in a TRP, and an Environmental Assessment/Initial Study (EA/IS). This integrated Feasibility Report/EA/IS with a Finding of No Significant Effect and Mitigated Negative Declaration, when final, will be submitted to HQUSACE, the Assistant Secretary of the Army for Civil Works and the Office of Management and Budget (OMB) for review and approval, and then transmitted to Congress for potential project authorization and funding of the Federal share of the project.

BACKGROUND

The U.S. Army Corps of Engineers (USACE) initiated the Feasibility Study at the request of Stanislaus County, the non-Federal sponsor for the study. The California Department of Water Resources (DWR) has contributed funding in support of the non-Federal share of the study costs. USACE and Stanislaus County are the lead agencies in the Feasibility Study, with USACE taking the lead under NEPA and Stanislaus County taking the lead under CEQA.

The local coordination partners in the Feasibility Study are the City of Newman and the Orestimba Creek Flood Control District. Numerous other agencies, organizations, and individuals participated in the study including local landowners and residents, the Central California Irrigation District (CCID), the California Department of Water Resources (DWR), the California Department of Fish and Game (CDFG), the U.S. Fish and Wildlife Service (USFWS), and The Nature Conservancy (TNC). Congressmen Dennis Cardoza and Jeff Denham, along with Assembly Member Anthony Canella and their staff members have been actively involved with the study.

As a result of flooding along Orestimba Creek in February, 1980, the Reclamation Board of the State of California (now known as the Central Valley Flood Protection Board [CVFPB]) requested that USACE investigate potential solutions to the flooding problems. A reconnaissance investigation by USACE was completed in July 1980 which resulted in a finding that a viable solution may exist to the flooding along Orestimba Creek. This study was not pursued due to lack of landowner support for the project. An earlier USACE effort in January 1964 was cited in this Reconnaissance Report but no report was produced. In March, 1995, Orestimba Creek experienced the largest storm over 78 years of record (1932 to 2010). At that time, 12,000 cubic feet per second (cfs) was recorded at the USGS gauge on Orestimba Creek near the California Aqueduct. The floodwater overwhelmed the channel and flowed overland across agricultural fields, backing up against a railroad embankment and inundating the City of Newman. Estimated damages from this flood event were $5.6 million. Stanislaus County

subsequently prepared a Hazard Mitigation Grant Application dated January 1996. At the request of Stanislaus County, USACE initiated a Section 905(b) Analysis in April 1997, which is a reconnaissance level investigation based on existing information. This investigation determined a likely Federal interest in flood damage reduction for Orestimba Creek. The Feasibility Phase was initiated in September 1998. A map of the study area is shown in Figure S-1.

CONSIDERATION OF ALTERNATIVE PLANS

During the feasibility study, the Federal planning process for development of water resource projects was followed to identify a recommended plan for implementation. Following definition of flood-related problems and opportunities, specific planning objectives and planning constraints were identified. Then various management measures were identified to achieve the planning objectives and avoid the planning constraints. Management measures were screened based on how well they met the study objectives and cost effectiveness, and some measures were dropped from further consideration at that point. The retained management measures were combined to form the building blocks of alternative plans.

A preliminary array of alternatives was developed that encapsulated the identified measures to address flooding problems in the study area. These preliminary alternatives included setback levees, bypasses, dry dams, channel improvements, a chevron levee (a partial ring levee) and various non-structural measures. The preliminary alternatives were developed to a level of detail to allow a basic comparison of the costs and benefits of each proposed plan. Many of these preliminary alternatives were eliminated based on estimated costs and potential mitigation requirements.

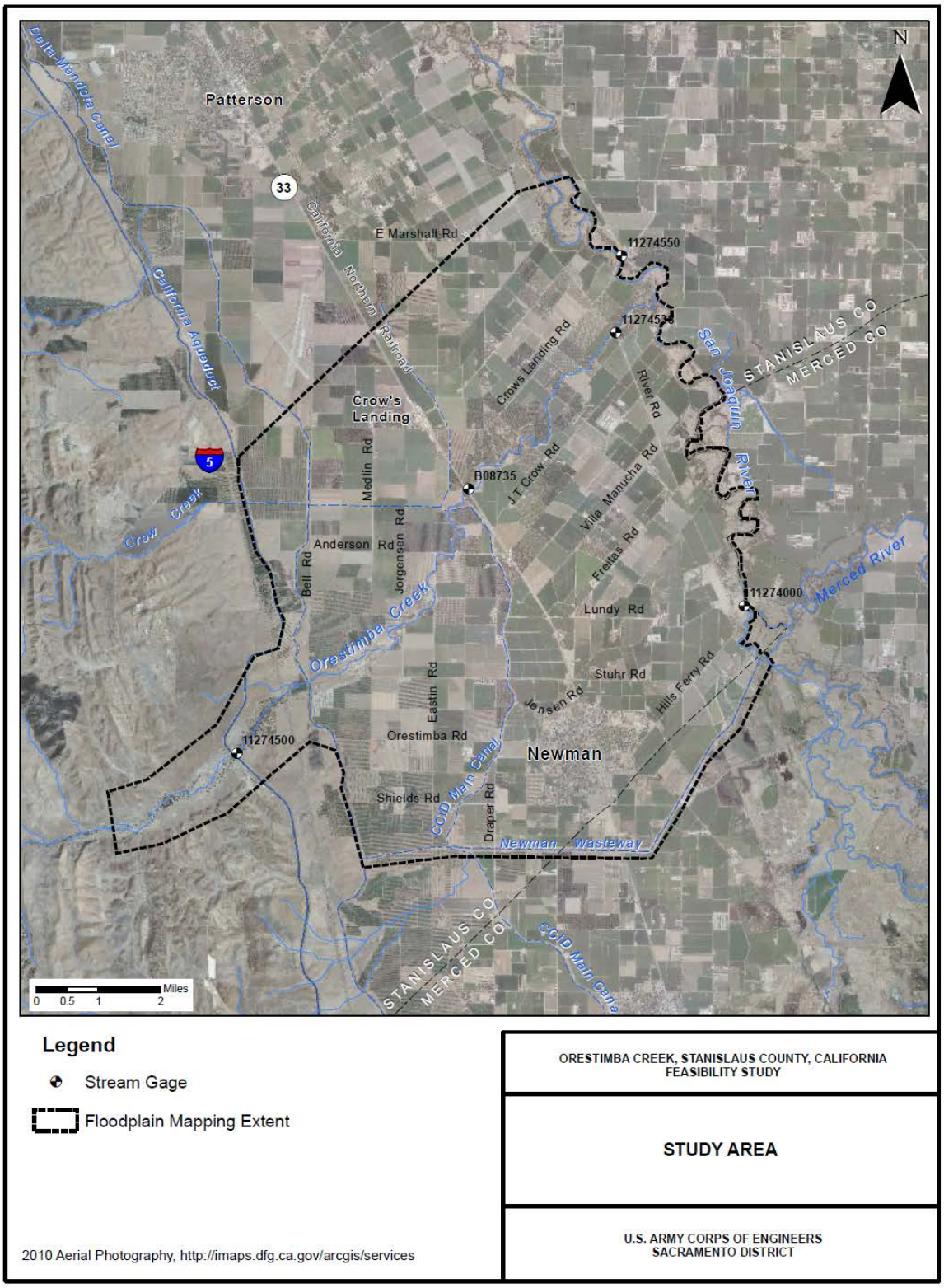


Figure S-1: The Orestimba Creek Study Area

Rather than a single feature fix to solve the flooding problems, the project delivery team (PDT) and local stakeholder group developed a series of plans which combined smaller versions of the preliminary alternatives into hybrid, or combined alternatives. The hybrid alternatives addressed the flooding problems in both the urban area of the City of Newman and the surrounding agricultural land. The result of this effort initially proved that the multi-feature approach was technically feasible and cost effective. The hybrid alternatives focused on a chevron levee which provided a high level of flood risk reduction to the town and channel modifications which provided a lesser amount of flood risk reduction to the agricultural areas. The added advantage of this dual approach was that the proposed alternative did not remove the agricultural area from the regulatory floodplain. If the project would provide flood risk reduction measures that would remove the agricultural area from the Federal Emergency Management Agency (FEMA) 1% floodplain, the landowners could petition for a change to the land use designation from agricultural to residential or commercial. As the study progressed to a more detailed design, it became apparent that the channel modifications, in the current design configuration, would not be incrementally justified. Therefore, in order to reduce the risk of flooding to the City of Newman as soon as possible, the study is progressing forward with only the Chevron Levee increment. The Channel Modification increment could be the focus of a later study focusing on ecosystem restoration of the creek or could be an initiative proposed by another agency or local group.

The Tentative National Economic Development Plan (Chevron Levee)

The National Economic Development (NED) plan consists of the construction of a chevron levee, or a partial ring levee, along the City of Newman's northwestern perimeter. The chevron levee maximizes benefits to the urban area by reducing flood damages associated with Orestimba Creek overflows. The north side of the chevron levee would be constructed along 1 mile of an unnamed farm road near Lundy Road, about 1 mile north of town. The western segment would be constructed along the eastern bank of the CCID Main Canal from the farm road south to the Newman Wasteway, a distance of about 4 miles. The chevron levee height would equate to about 112.8 feet in elevation (using the NAVD88 datum), which means the levee would be about 4 to 5 feet high, depending on the ground elevation changes along the levee alignment. This levee elevation captured the most benefits for the least amount of costs and was therefore identified as the elevation that would be included in the NED plan.

The NED plan also includes several non-structural features to further reduce the consequences of flooding. These include an advanced warning system based on stream gages at the several points where the creek historically has overflowed its banks. This flood warning system would be combined with an emergency evacuation plan. A reverse 911 system would alert surrounding residents of the flood threat, especially if the flood peak occurs during the night, as happened in 1995. Public educational materials would be distributed annually as part of the Orestimba Creek Flood Control District's assessment mailing. The materials would include a floodplain map and description of the nature and type of flooding. The material would also

describe the risks of traversing flooded roadways. Informational signs would be placed along roads which alert drivers to the possibility of flooding in the area.

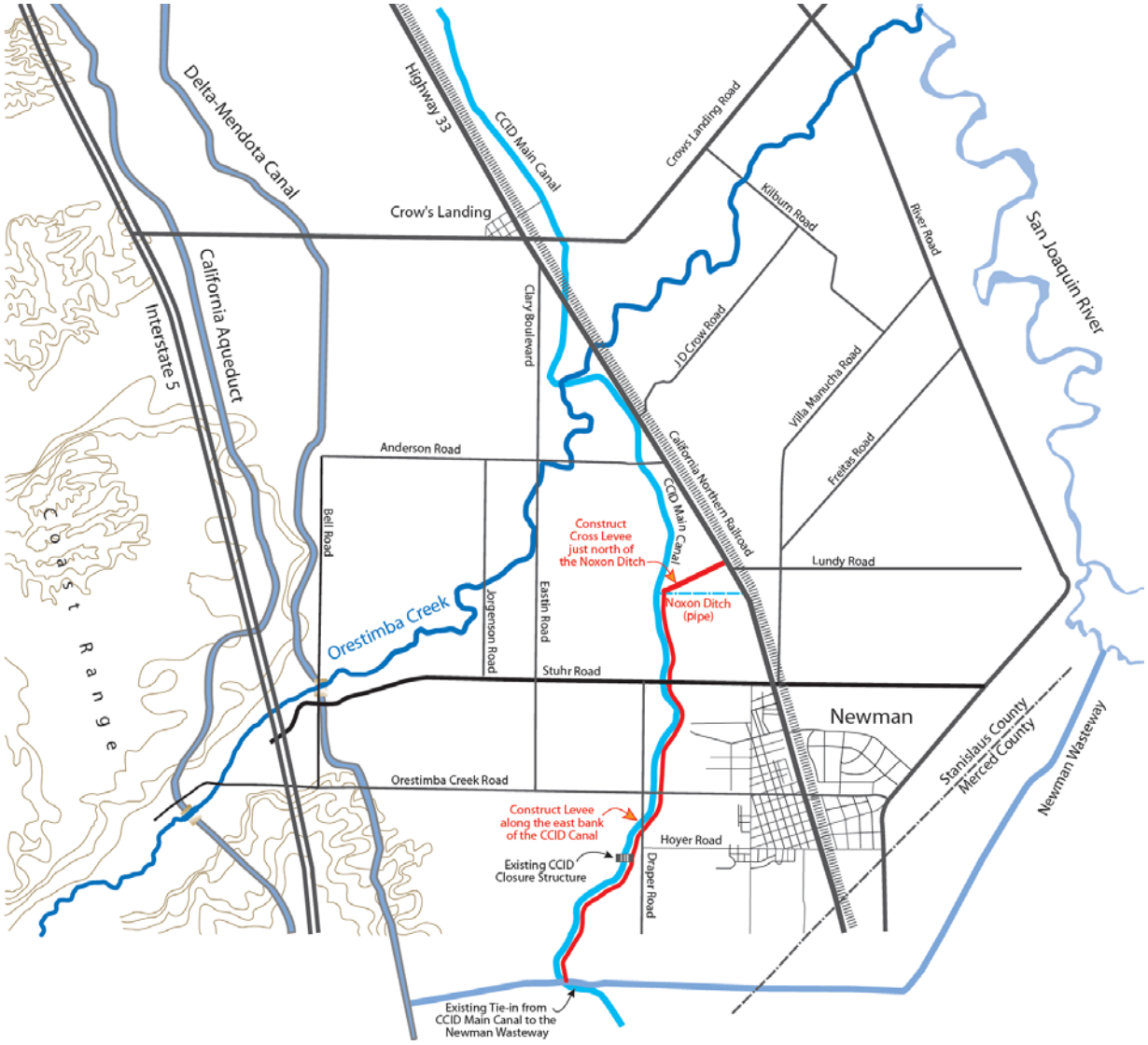


Figure S-2: The Tentative NED Plan

Various chevron levee alignments and heights were analyzed in the process of identifying the NED plan. Alignments which improved the Main Canal berm further to the north were also considered but were dropped because of the deeper floodplains which resulted. This northern alignment also directed floodflows to the opposite side of the creek, causing significant induced flooding. A levee alignment along Stuhr Road was also evaluated. There were several benefits

of locating the levee at the farm road location rather than the Stuhr Road location. The probability of induced flooding was found to be less for the farm road levee based on a review of existing condition flood inundation maps. In addition, the overall cost would be lower due to less material being required, fewer utilities to contend with, and no traffic to re-route during construction.

The Locally Preferred Plan (Chevron Levee with State of California Required Freeboard)

The Locally Preferred Plan (LPP) includes the same elements as the NED plan but raises the height of the chevron levee to include 3 feet of freeboard above the median 1/200 (ACE) water surface elevation. This freeboard was requested by the local sponsor in order to meet State of California requirements for an urban area which is identified as the 1/200 year median Water Surface Elevation (WSEL) plus 3 feet of freeboard. The LPP levee would be 6 to 7 feet tall, or about 2 feet taller than the NED levee.

For accreditation purposes, FEMA requires a levee to be either: a) 3 feet above the median 1% WSEL with a 90% assurance for the 1% event or b) 2 feet above the median 1% WSEL with 95 % assurance for the 1% event. The NED levee is about 1.5 feet shorter than these criteria; however, the LPP achieves it. The State of California requires urban and urbanizing areas (with a population of 10,000 or greater) to achieve 1/200 ACE year level of flood risk management in order to qualify for State funding of flood management projects. The State's urban levee design criteria (15 November 2011 Draft) requires 3 feet of freeboard above the median 1/200 ACE water surface elevation or higher if required for wind setup and wave run up. It was determined that additional freeboard to account for wind waves would not be required.

There is basically no quantifiable difference between the economic benefits attributed to the NED and the LPP; however, the LPP would allow the sponsor to meet State of California requirements as well as FEMA accreditation requirements.

The State criteria also specifies that civil engineers would be allowed and encouraged to adjust the Design Water Surface Elevation (DWSE) upward to account for climate change. Additional freeboard was not specified for climate change in the LPP. The 200-year median water surface profile was found to be relatively insensitive to increased flood discharge. The difference between the median 1/100 ACE and median 1/200 ACE water surface elevation was found to be less than 0.4 feet along the proposed levee.

The Tentatively Recommended Plan

The TRP is the LPP; however, Federal cost sharing will be capped at 65% of the NED plan. This plan is justified and has a benefit to cost ratio of 1.34. This plan allows the local community to meet both FEMA certification requirements and the State of California's criteria for funding of flood risk management projects. An exception from the Assistant Secretary of the Army for Civil Works (ASA(CW)) has been granted to allow USACE to recommend the LPP over the NED plan.

Due to the small increase in costs of the LPP over the NED this exception is warranted in order for the local community to meet FEMA and State of California requirements, in addition to reducing the residual risk associated with the project.

SIGNIFICANT ENVIRONMENTAL EFFECTS

An evaluation of environmental effects determined that the proposed action has the potential for adverse effects on a variety of environmental resource areas. A summary of impacts, mitigation measures, and level of impacts with mitigation is provided in Table S-2.

In all cases the potential adverse environmental effects would be reduced to a less than significant level through project design, construction practices, preconstruction surveys and analysis, regulatory requirements, and best management practices. No compensatory mitigation would be required. A geotechnical analysis of underlying substrates and water quality analysis of construction activities and methods would be conducted during the preconstruction, engineering, and design (PED) phase to further refine potential impact analysis. A National Pollutant Discharge Elimination System (NPDES) general construction permit and a San Joaquin Valley Flood Control District (SJVFCD) encroachment permit would be also be required. A Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasures Plan (SPCCP) would be developed by the contractor prior to construction.

The potential for impacts to wetlands, vegetation communities, and special status species has been greatly reduced through construction design. Direct impacts to nesting birds and other sensitive species would be avoided by implementing preconstruction surveys and scheduling of construction activities. The Draft Coordination Act Report received from the U.S. Fish & Wildlife Service (USFWS) states that USFWS has no recommendations for design refinement or mitigation for the project as currently proposed (USFWS 2012). USACE has determined that the project is not likely to adversely affect any special status species with the potential to occur in the project area. USFWS concurrence with the determination will be requested prior to project approval.

Table S-1. Summary of Potentially Significant Effects and Mitigation Measures

Potentially Significant Effects	Mitigation Measures	Effects with Mitigation
SEISMIC		
None	None	Less than significant
GEOLOGY		
Subsidence or liquifaction	1 – Pre-construction geotechnical study in PED to refine project design and ensure construction according to State and USACE guidelines	
SOILS		
Erosion during construction	1 – Development and	Less than significant

	implementation of a Storm Water Pollution Prevention Plan	
GEOMORPHOLOGY		
None	None	Less than significant
HYDROLOGY		
Reduction of risk of property loss, injury, and death involving flooding.	None	Beneficial
WATER QUALITY		
Run off from areas of ground distubance during construction	1 – Development and implementation of a Storm Water Pollution Prevention Plan	Less than significant
Reduction in the frequency and volume of polluted discharge and the reduction in exposure to pollutants would result in a net improvement to water quality	None	Beneficial
GROUNDWATER		
None	None	Less than significant
WATERS OF THE U.S. AND WETLANDS		
None	None	None
AIR QUALITY		
Temporary increase of criteria pollutants during construction	1 - Minimize construction footprint 2 - Wet soils when beneficial for the suppression of windborne dust 3 - Suitable excavated materials would be used in the construction of levees or would be spread on adjacent agricultural fields	Less than significant
VEGETATION		
None	None	None
WILDLIFE AND FISHERIES		
Short-term loss of wildlife habitat associated with agricultural margins, and impacts on water quality could impact local fish populations	1 - Hydroseed levee slopes and staging areas with native grasses 2 - Development and implementation of a Storm Water Pollution Prevention Plan	Less than significant
SPECIAL STATUS SPECIES		
Loss or degradation of wildlife habitat and displacement of common wildlife	1 – Pre-construction bird surveys (Swainson's hawk and burrowing owl) and coordination with USFWS 2 – Pre-constructin kit fox survey and coordination with USFWS 3 – Pre-construction elderberry survey and coordination with USFWS	Less than significant
INVASIVE PLANTS AND NOXIOUS WEEDS		
Promote the establishment of invasive plants and noxious weeds	None	Less than significant
SOCIOECONOMICS		

Reduce flood damage risk	None	Beneficial
Improve profitability of agricultural fields	None	Beneficial
Reduce insurance costs	None	Beneficial
LAND USE		
Unnecessary or unavoidable conversion of farmlands	None	Less than Significant
TRANSPORTATION		
Increased flood depths on roadways	1 - Install temporary barriers and signage to prevent motorists from entering roadways	Less than significant
UTILITIES AND PUBLIC SERVICES		
None	None	Less than significant
RECREATION		
None	None	None
AESTHETICS		
Short-term impacts from night lighting	1 - Avoid nighttime construction to the extent practicable 2 - Shield lighting away from residential areas 3 - Avoid the Newman Gateway	Less than significant
NOISE		
Increased noise levels near sensitive receptors	1 - Restrict night-time construction near residences 2 - Locate staging areas at least 700 feet from residential areas 3 - Design construction and detour routes that avoid noise-sensitive receptors to the extent practicable	Less than significant
HAZARDOUS, TOXIC, AND RADIOLOGICAL WASTES		
Accident leaks or spills during construction	1 - Development and implementation of a Storm Water Pollution Prevention Plan 2 - Develop a SPCCP that would limit the potential for hazardous materials and toxic substances to impact soils or water bodies during construction 3 – Conduct Phase I Environmental Site Assessment prior to construction	Less than significant
CULTURAL RESOURCES		
Unanticipated discovery of cultural resources within Area of Potential Effects	None	Less than significant

ESTIMATED COST AND COST SHARING

Investment costs, annual costs, and annual benefits are displayed in Table S-2 below.

Table S-2: Comparison of Total Annual Benefits and Costs for the NED and LPP[1,2]

Item	NED Plan	LPP Plan
Investment Costs:		
Flood Risk Management First Costs	35,200,000	44,000,000
Less Cultural Resource Preservation[3]	-300,000	-350,000
Interest During Construction	2,100,000	2,700,000
Total	**37,000,000**	**46,350,000**
Annual Cost		
Interest and Amortization	1,726,000	2,159,000
OMRR&R[4]	164,000	180,000
Total	**1,890,000**	**2,339,000**
Annual Benefits	3,128,000	3,128,000
Net Annual Flood Risk Management Benefits	1,238,000	789,000
Benefit to Cost Ratio	1.66	1.34

[1] Based on October 2011 price levels, 4 percent rate of interest, and a 50-year period of analysis.
[2] Some numbers have been rounded and may be slightly different than those displayed in the appendices.
[3] Cultural Resource costs are contingency cost based on .4% of project first costs and are not cost shared.
[4] Operation, Maintenance, Repair, Replacement and Rehabilitation

The estimated total project first cost for the TRP is $44,000,000. Federal costs are capped at 65% of the NED plan which is estimated to cost $35,200,000. Cultural Resource Preservation costs of $350,000 will be added as part of the Federal costs. A summary of cost sharing responsibilities is presented in Table S-3.

Table S-3: Summary of Cost Sharing Responsibilities: Tentatively Recommended Plan[1]

Item	Federal[2]	Non-Federal
Flood Risk Management	22,880,000	21,100,000
Cultural Resource Preservation	350,000	
Total	23,230,000	21,100,000
Breakdown of Non-Federal		
LERRDs[3]		8,700,000
5% Cash Requirement		2,200,000
Remaining Cash		10,200,000
Total		21,100,000

[1] Based on October 2011 price levels, 4 percent rate of interest, and a 50-year period of analysis.
[2] Federal Project First Costs are based on 65% of the NED Plan of $35.2 million.
[3] Non-Federal interests must provide all LERRDs and a minimum cash contribution of 5% of the total project cost. Non-structural elements of the plan do not require the 5% cash contribution.

AREAS OF CONTROVERSY OR UNRESOLVED ISSUES

Increased Depth of Flooding

Based on the results of hydraulic modeling, the area north and east of the levee tie-in with the railroad might experience increased depths in some locations with implementation of the project. The depth of the potential increases during peak flows, which are projected to recede within 24 hours, would vary under each flood event scenario based on the existing topography. The range of depths under each frequency scenario is generally similar under both existing and with project conditions. The main difference would likely be during the 1/10 ACE, in which depths in some places could increase by up to 6 inches.

Agriculture (row crops) is the primary land use within the area that could experience increased flood depths. Four residences are also located within this area. The potential increased depth that could occur during the 1/10 ACE at each residence ranges from 3 to 6 inches. A windshield survey determined that each residence is on a raised foundation with several steps required to reach the first floor elevation. In addition, the structures are located on raised building sites, putting the first floor elevation well above the modeled potential depths. The potential for increased depths in areas already flooded under existing conditions was analyzed by USACE real estate specialists and was determined not to constitute a taking of private land for public use.

Coordination with Union Pacific Railroad

The current design includes a closure structure across the Railroad tracks to prevent floodwater from overtopping the levee at this point. The Union Pacific Railroad, which owns the tracks, has stated that the preferred method of dealing with the floodwater would be to raise the railroad berm rather than include a closure structure. The costs associated with raising the railroad berm, along with the additional levee height that would be required to implement this measure, means this measure would not be economically justified.

Recommendation of the LPP as the Tentatively Recommended Plan

The TRP in this report is the LPP, which is larger than the NED plan. Cost sharing of the TRP would remain at 65% of the NED plan. The LPP is recommended instead of the NED in order for the community to meet FEMA and State of California requirements. The ASA(CW) has granted the exception required to recommend the LPP over the NED.

MAJOR CONCLUSIONS

The preliminary recommendation of the District Engineer of the Sacramento District, U.S. Army Corps of Engineers is that the recommended plan be authorized for implementation as a Federal project. The estimated first cost of the tentatively recommended plan is $44,000,000 and the estimated annual OMRR&R cost is $180,000 (October 2011 price levels). The Federal portion of the estimated first cost is $23,230,000 and is based on the cost sharing level established by the NED plan. The estimated fully funded Federal first cost, based on projected inflation rates specified by Corps budget guidance, is $24,900,000.

The non-Federal sponsor portion of the estimated first cost is $21,100,000. The non-Federal sponsor shall agree to provide all lands, easements, rights-of-way, relocations, and suitable borrow and disposal areas. The non-Federal sponsor shall also assume responsibility for operating, maintaining, replacing, repairing, and rehabilitating (OMRR&R) the project. The non-Federal sponsor shall publicize floodplain information in the areas concerned and provide this information to zoning and other regulatory agencies for their guidance and leadership in preventing unwise future development in the floodplain and in adopting such regulations as may be necessary to ensure compatibility between future development and protection levels provided by the project.

CONTENTS*

* *NOTE TO THE READER: The Environmental Assessment for this study has been integrated into the following Feasibility Report in accordance with ER 1105-2-100. Sections of the report that are required for compliance with the National Environmental Policy Act (NEPA) are noted by an asterisk (*) in the Table of Contents.*

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES*

ACRONYMS AND ABBREVIATIONS

Term	Definition
ACE	Average Chance Exceedance
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADT	average daily traffic
APE	Area of Potential Effects
BSC	Building Standards Commission
CALFED	CALFED Bay-Delta Program
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CCIC	Central California Information Center
CCID	Central California Irrigation District
CDFG	California Department of Fish and Game
CDPR	California Department of Pesticide Regulation
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFC	chlorofluorocarbons
CFCP	California Farmland Conservancy Program
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNRR	California Northern Railroad
CO	carbon monoxide
CO_2	carbon dioxide
CVFPA	Central Valley Flood Protection Act
CVFPB	Central Valley Flood Protection Board
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel scale
DNL	day-night level
DPS	Distinct Population Segment
DWR	Department of Water Resources
EA/IS	Environmental Assessment/Initial Study

Term	Definition
EDR	Environmental Data Resources, Inc.
EFH	Essential Fish Habitat
EO	Executive Order
FEMA	Federal Emergency Management Agency
FFA	Flood Frequency Analysis
FONSI	Finding of No Significant Impact
FR	Federal Register
FS	feasibility study
GHG	greenhouse gases
GSRC	Gulf South Research Corporation
HCFC	hydrochlorofluorocarbons
HEC	Hydraulic Engineering Center
HTRW	hazardous, toxic, and radioactive waste
I-5	Interstate 5
LAFCO	Local Agency Formation Commission
LESA	Land Evaluation and Site Assessment
LPP	Locally Preferred Plan
LOS	level of service
MCL	maximum contaminant levels
mgd	million gallons per day
NCRR	Northern California Railroad
NED	National Economic Development
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O_3	ozone
OMRR&R	operation, maintenance, repair, replacement and rehabilitation
OSE	other social effects
P&G	Principles and Guidelines
PA	programmatic agreement
PDT	project delivery team
PED	preconstruction engineering and design

Term	Definition
PL	Public Law
$PM_{2.5}$	particulate matter of 2.5 microns or less in diameter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
RED	Regional Economic Development
SB	Senate Bill
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_4	sulfates
SOI	sphere of influence
SSC	species of special concern
SWPPP	Storm Water Pollution Prevention Plan
TMDL	total maximum daily loads
TNC	The Nature Conservancy
USC	United States Government Code
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	U. S. Geological Survey
UST	underground storage tank
Valley Air District	San Joaquin Valley Air Pollution Control District
VELB	valley elderberry longhorn beetle
VOC	volatile organic carbon
WSEL	water surface elevation
WWTDF	waste water and disposal facility

CHAPTER 1 – STUDY INFORMATION

1.1 PURPOSE AND NEED FOR THE PROJECT AND REPORT

The purpose of the Orestimba Creek project is to investigate and determine the extent of Federal interest in plans that reduce flood risk in the City of Newman and the surrounding agricultural areas, which have experienced multiple flooding events in the past 75 years since records have been maintained. This report: (1) assesses the risk of flooding to the City of Newman and the surrounding agricultural areas; (2) describes a range of alternatives formulated to reduce flood risk; and (3) identifies a tentatively recommended plan for implementation. This report constitutes both a draft Feasibility Report that describes the planning process followed to identify the tentatively recommended plan and an Environmental Assessment/Initial Study, as required to comply with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Following public and governmental agency review, this draft report will be finalized and submitted to higher U.S. Army Corps of Engineers (USACE) authority for review and approval, then transmitted to Congress for potential project authorization and funding of the Federal share of the project.

1.2 STUDY AUTHORITY

This investigation is being conducted under the authority of the Flood Control Act of 1936 (Public Law [PL] 74-738). Section 2 of this Act states "that, hereafter, Federal investigations and improvements of river and other waterways for flood control and allied purposes shall be under the jurisdiction of and shall be prosecuted by the War Department under the direction of the Secretary of War and supervision of the Chief of Engineers…". Section 6 of the 1936 Flood Control Act states: "The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys for flood control at the following named localities… Provided further, That after the regular or formal reports made as authorized on any examination, survey, project, or work under way or proposed are submitted to Congress, no supplemental or additional report or estimate shall be made unless authorized by law or by resolution of the Committee on Flood Control of the House of Representatives or the Committee on Commerce of the Senate:. Sacramento and San Joaquin River Valleys, California

House Document No. 367, dated October 13, 1949, is a Letter from the Secretary of the Army on the Sacramento – San Joaquin Basin Streams, California which states: "A Letter from the Chief of Engineers, United States Army, Dated July 27, 1948, submitting a report, together with accompanying papers and illustrations, on preliminary examinations and surveys of Sacramento-San Joaquin River Basin Streams, California. For Flood Control and allied purposes listed in the Report. This investigation was authorized by the Flood Control Acts of June 22, 1936 and June 28, 1938."

A House Resolution was adopted on May 8, 1964 which stated: "Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the report on Sacramento-San Joaquin Basin Streams, California, published as House Document No. 367, 81st Congress, 1st Session, and other reports, with a view to determining whether any modifications of the recommendations contained therein are advisable at this time, with particular reference to further coordinated development of the water resources in the San Joaquin River Basin, California."

This study will only partially address the San Joaquin River Basin Authority. Therefore, the Orestimba Creek Feasibility Study will be called an "Interim Feasibility Report" which indicates that the study is addressing the water resource issues of a specific area within the authority, rather than the entire area authorized for study.

Funds to initiate the study were provided in the Energy and Water Development Appropriations Bill, (HR 104-679) 1997, for the San Joaquin River Basin, West Stanislaus County, California. Beginning in 2003 funding was provided specifically for San Joaquin River Basin, West Stanislaus County, Orestimba Creek.

1.3 STUDY LOCATION

The study area (see Figures 1-1 & 1-2) is located on the west side of the San Joaquin River in Stanislaus County, California. It encompasses approximately 186 square miles of rangeland and very productive irrigated cropland. The largest community in the study area is the city of Newman, which is located along State Highway 33. Modesto, the county seat is located 20 miles from the city of Newman. Orestimba Creek is a "west side tributary" to the San Joaquin River, and originates from the eastern slopes of the Diablo Range, a section of the larger Coast Range of California. Orestimba Creek is traversed by U.S. Interstate Highway 5 (I-5), the California Aqueduct, the Delta-Mendota Canal, State Highway 33, the Northern California Railroad (NCRR), and the Central California Irrigation District (CCID) Main Canal. Elevations vary from 45 feet above sea level at the San Joaquin River to about 3,600 feet at the headwaters of Orestimba Creek. The creek is ephemeral, with high flows normally occurring in late winter, and irrigation drainage accounting for low flows during the summer months. The creek flows in a northeasterly direction through steep mountain canyons until it emerges at the edge of the foothills. Here, on the gently sloping valley floor, the decreased slope and size of the streambed reduces the creek's channel capacity. Flood flows spread over a wide undefined alluvial fan. Most west side tributary streambeds disappear in the area, join other creeks, or are confined to man made structures due to farming. Orestimba Creek is one of the few tributaries to maintain a definite open channel from the Coast Range to the San Joaquin River.

Figure 1-1. Regional Map

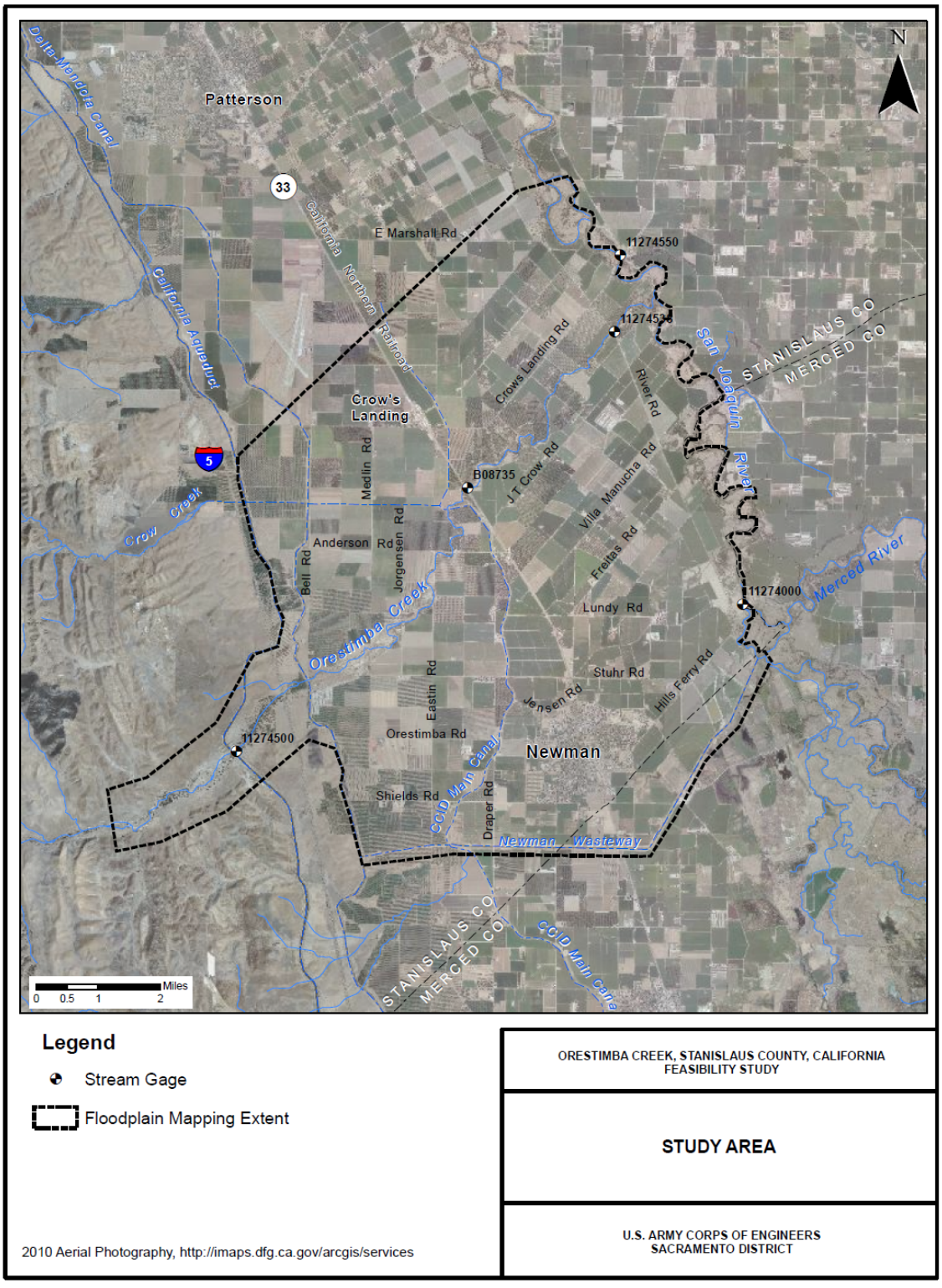


Figure 1-2 Orestimba Creek Study Area

Orestimba Creek is one of the last remaining wildlife corridor connections between the San Joaquin River and the Coast Range of California. For this reason, the California Department of Fish and Game has identified the creek as one of potential interest for conservation and restoration. Orestimba Creek is located between several large wildlife refuges owned and operated by the U.S. Fish and Wildlife Service (USFWS). The San Luis National Wildlife Refuge Complex – composed of the San Luis National Wildlife Refuge, Merced National Wildlife Refuge, San Joaquin River National Wildlife Refuge and the Grasslands Wildlife Management Area – consists of nearly 45,000 acres of wetlands, grasslands and riparian habitats, as well as over 90,000 acres of conservation easements on private lands for the protection and benefit of wildlife. The refuge units are located in the northern San Joaquin Valley of California in Merced and Stanislaus Counties.

The Complex is located within the Pacific Flyway, a major route for migrating birds, including waterfowl. The extensive wetlands of the Complex and surrounding lands provide habitat for up to a million waterfowl that arrive here each winter. Of the 30 species of waterfowl using the Complex, the most common include Ross' geese, Aleutian cackling geese, Snow geese, Green-winged Teals, Mallards, Northern Pintails, Gadwalls, American wigeons, Northern Shovelers, and White-fronted geese. The Complex is an integral part of a mosaic of Federal, State, and private lands in Merced County that together constitute the largest contiguous freshwater wetlands remaining in California.

The Nature Conservancy (TNC) owns and operates a large ranch upstream of the study area in which they have designed a stream restoration project along Orestimba Creek to improve the water quality and allow for the establishment of seedling trees and natural regeneration of native plants. This rugged and sparsely populated area is experiencing significant development pressure from the San Francisco Bay Area to the west and the Central Valley to the east. Orestimba Creek is a critical natural link between the conservation areas in the Coast Range and the Refuge lands along the San Joaquin River.

Figure 1-3: Regional Conservation Lands

1.4 STUDY SPONSOR AND PARTICIPANTS

USACE initiated the Feasibility Study at the request of Stanislaus County, the non-Federal sponsor for the study. The State of California Department of Water Resources (DWR) has contributed funding in support of the non-Federal share of the study costs. USACE and Stanislaus County are the lead agencies in the Feasibility Study, with USACE taking the lead under NEPA activities and Stanislaus County taking the lead under CEQA.

The local coordination partners in the Feasibility Study are the City of Newman and the Orestimba Creek Flood Control District. Numerous other agencies, organizations, and individuals participated in the study including local landowners and residents, CCID, DWR, the California Department of Fish and Game (CDFG), USFWS, and TNC. Congressmen Dennis Cardoza and Jeff Denham, along with Assembly Member Anthony Canella, and their staff have been actively involved with the study.

1.5 HISTORY OF ORESTIMBA CREEK INVESTIGATIONS

As a result of flooding along Orestimba Creek in February 1980, the Reclamation Board of the State of California (now known as the Central Valley Flood Protection Board [CVFPB]) requested that USACE investigate potential solutions to the flooding problems. A reconnaissance investigation by USACE was completed in July 1980 which resulted in a finding that a viable solution may exist to the flooding along Orestimba Creek. This study was not pursued due to lack of landowner support for the project. In March 1995, Orestimba Creek experienced the largest storm over 78 years of record (1932 to 2010). At that time, 12,000 cubic feet per second (cfs) was recorded at the U.S. Geological Survey (USGS) gauge on Orestimba Creek near the California Aqueduct. The floodwater overwhelmed the channel and flowed overland across agricultural fields, backing up against a railroad embankment, and inundating the City of Newman. Stanislaus County subsequently prepared a Hazard Mitigation Grant Application dated January 1996. At the request of Stanislaus County, USACE initiated a Section 905(b) Analysis in April 1997, which is a reconnaissance level investigation based on existing information. This investigation determined there was likely a Federal interest in flood risk reduction measures for Orestimba Creek including increasing the capacity of the Creek and a potential upstream detention facility. The Feasibility Phase was initiated in September 1998.

1.6 EXISTING PROGRAMS, STUDIES, AND PROJECTS

There are several ongoing water resources related programs, projects, and studies that could affect flood risk management and ecosystem conditions in the San Joaquin River Basin. Those efforts that pertain to this feasibility study are summarized in the sections below.

1.6.1 Programs

CALFED Bay-Delta Program (CALFED). CALFED was established in May 1995 as a cooperative effort among the State and Federal agencies that handle management and regulatory responsibilities in the Sacramento and San Joaquin River Delta, commonly referred to as the Bay-Delta. CALFED's mission is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta. In July 2003, the State of California formalized the cooperative effort by creating the CALFED Bay-Delta Authority, a State agency responsible for overseeing implementation of the Bay-Delta Program.

Central Valley Project Improvement Act (CVPIA). The Central Valley Project (CVP) was authorized by Congress in 1937 as a multipurpose development to store and transfer surplus water primarily from the Sacramento and Trinity River basins to the water-deficient lands of the San Joaquin River and Tulare Lake Basins. The project is operated by the U.S. Bureau of Reclamation (USBR). The CVPIA amended the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes, having equal priority with irrigation and domestic water supply uses, fish and wildlife enhancement, and power generation. The CVPIA gives first priority to measures that protect and

restore natural channel and riparian habitat values through habitat restoration actions.

Federal Emergency Management Agency (FEMA), Flood Mitigation Assistance Program and the Hazard Mitigation Grant Program. These programs seek to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. In order to qualify for these programs, a community must be enrolled in the National Flood Insurance Program (NFIP) and have a Flood Mitigation Plan approved by the FEMA Regional Director. This plan must include a description of the existing flood hazard and identification of the flood risk including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential. A project must be cost-effective, not costing more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future flooding were to occur, computed on a net present value basis. Applicants for these programs must compete for the funding. The City of Newman and Stanislaus County are both enrolled in the NFIP. Stanislaus County's enrollment covers the unincorporated areas of the County, which includes the study area outside of the Newman City limits.

Designated Floodway Program. The Central Valley Flood Protection Board (CVFPB) of the State of California administers the Designated Floodway Program, which addresses land use management within the floodway. This program provides a nonstructural way to keep development from encroaching into flood-prone areas. It also reduces future potential flood damages by preserving the reasonable flood passage capacities of natural watercourses. The CVFPB controls the Designated Floodway Program by adopting floodway boundaries, developing plans for modifications of boundaries, and approving changes in acceptable use and types of structures within the floodways. Within the study area, the low elevation lands along the San Joaquin River are part of the designated floodway in lieu of project levees.

1.6.2 Projects

The Nature Conservancy, Mount Hamilton Area. This area, east of San Jose between Highway 101 and Interstate 5, is a unique, intact California landscape of oak woodlands, sycamore valleys, stream-fed canyons, and pine-topped ridges. Yet this biologically rich habitat is seriously threatened, by the encroachment of two burgeoning population centers: the Silicon Valley to the west and the Central Valley to the east. TNC's strategy is to connect the extensive public lands in the area by securing the permanent protection of key private properties that surround and link them. These private lands, which are largely cattle ranches, will create a circle of protection around the core of the wilderness. TNC has been working to ensure permanent conservation management of nearly 500,000 acres within the Mt. Hamilton area by protecting high-priority private properties from fragmentation and development, developing prescriptions for compatible land uses in the project area, and building the capacity of local institutions for long-term conservation management.

The Nature Conservancy, Simon-Newman Ranch. This 33,000-acre property, owned by TNC as part of the Mount Hamilton Project, is located in the upper watershed of Orestimba Creek. Protection of this site will serve as a major wildlife corridor in this central part of the Diablo Mountain Range. Upon the sale of the Simon-Newman Ranch, TNC will reserve a conservation easement on the property. The easement will eliminate future subdivision and development, with the exception of negotiated residential structures, horse corrals, and paddocks and barns. A detailed Grazing Management Plan has been prepared to integrate cattle ranching and strategic protection of TNC's Conservation Values. CDFG will be allowed to have annual controlled public hunting programs 30 days a year.

U.S. Fish and Wildlife Service. San Joaquin River National Wildlife Refuge. The San Joaquin River National Wildlife Refuge is located within the historic floodplain of the confluences of the San Joaquin, Stanislaus, and Tuolumne Rivers and downstream from the confluence with Orestimba Creek. Refuge lands consist of oak-cottonwood-willow riparian forest, pastures, agricultural fields, and wetlands. This refuge was established in 1987 under authority of the Endangered Species Act, the Land and Water Conservation Fund Act, and the Migratory Bird Conservation Act. The original refuge land base of 1,638 acres has grown tremendously. Through recent land acquisitions, the refuge has increased to 6,642 acres within an approved refuge boundary of 12,877 acres.

U.S. Fish and Wildlife Service. San Luis National Wildlife Refuge. This 26,609-acre refuge is a mixture of managed seasonal and permanent wetlands, riparian habitat associated with three major watercourses, and native grasslands/alkali sinks/vernal pools. The refuge is primarily managed to provide habitats for migratory and wintering birds. The largest concentration of mallards, pintails, and green-winged teal in the San Joaquin Valley are found here. One of only 22 herds of the indigenous Tule elk is located here, as are a variety of endangered, threatened, and sensitive species.

U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Wetland Reserve Program. California's Wetlands Reserve Program has focused on the restoration of a variety of wetland types throughout the state, including seasonal wetlands, semi-permanent marshes, and vernal pools along the perimeter of the Central Valley, riparian corridors, and tidally-influenced wetlands. The Wetland reserve program has been used to restore land along the San Joaquin River that has experienced flooding.

1.6.3 Studies

Several previous studies with information specific to the project area are listed here.

U. S. Army Corps of Engineers. Detailed Project Report for Flood Control on Orestimba Creek Stanislaus County, California. 1981. This study was conducted under the authority of Section 208 of the Flood Control Act of 1954, as amended and pursuant to ER 1105-2-50. It was conducted in response to a request from the California Reclamation Board (now known as the CVFPB). The proposed plan to reduce flooding along Orestimba Creek included clearing of vegetation and excavation of about 54,000 cubic yards of material from the stream channel between Highway 33 and Morris Road. This plan would increase the flow capacity of Orestimba Creek from about 2,800 cubic feet per second (cfs) to about 4,000 cfs. An annual maintenance program would be required to keep the channel clear of sediments and vegetation. The State Reclamation Board, as the non-federal sponsor, informally agreed to proceed with the project although the project was later terminated because property owners along the creek would not consent to rights-of-entry for the study investigation.

Stanislaus County, Department of Public Works. Orestimba Creek Flood Hazard Mitigation Project. A Hazard Mitigation Grant Program Application with the State of California Office of Emergency Services. January 1996. This grant application, which was not funded, consisted of three proposed elements, called phases, designed to reduce flood damages from Orestimba Creek in and around the City of Newman. Phase 1 consisted of an intertie pipeline facility between the Newman Wasteway and the CCID Canal. Flood waters from Orestimba Creek flow surge out of the creek channel and run parallel and occasionally flow in to the CCID Canal. The Canal intersects the Newman Wasteway south of Newman where the proposed project element would enable floodwaters to enter the wasteway and be transported to the San Joaquin River. This feature has since been constructed as a joint effort between the CCID and the City of Newman. Phase 2 would consist of improving the Orestimba Creek flow capacity under California Northern Railroad (CNRR) trestle. Phase 3 would include a short levee along the Creek in an area with minimal channel capacity, a siphon to evacuate floodwater collecting on the uphill side of the CCID canal, and the replacement of a privately owned bridge.

Numerous other prior studies and reports have valuable background information for the Feasibility Study. These studies and reports are listed in Chapter 12.

1.7 PLANNING PROCESS AND REPORT ORGANIZATION

The planning process consists of six major steps: (1) specification of water and related land resources problems and opportunities; (2) inventory, forecast, and analysis of water and related land resources conditions within the study area; (3) formulation of alternative plans; (4)

evaluation of the effects of the alternative plans; (5) comparison of the alternative plans; and (6) selection of the tentatively recommended plan based upon the comparison of the alternative plans.

This report documents the study process. It also serves as the environmental document for compliance with NEPA and CEQA. The chapter headings and order in this report generally follow the outline of an Environmental Assessment/Initial Study (EA/IS). The report chapters relate to the six steps of the planning process as follows:

- The second chapter of this report, Need for and Objectives of Action, covers the first step in the planning process (specification of water and related land resources problems and opportunities. It also covers the second step of the planning process (inventory and forecast) to the extent necessary to establish the future without project condition prior to development of the alternatives.
- The third chapter of this report, Alternative Plans, is the heart of the report and is therefore placed before the more detailed discussions of resources and effects. It covers the third step in the planning process (formulation of alternative plans), the fifth step in the planning process (comparison of alternative plans), and the sixth step of the planning process (selection of the recommended plan based upon the comparison of the alternative plans).
- The fourth chapter of this report, Affected Environment, covers the second step of the planning process (inventory, forecast and analysis of water and related land resources) in greater detail than what was covered in Chapter 2.
- The fifth chapter of this report, Environmental Consequences, covers the fourth step of the planning process (evaluation of the effects of the alternative plans).
- The remaining chapters of the report discuss public involvement, review, and consultation (Chapter 6); list the report preparers (Chapter 7); describe compliance with applicable laws, policies, and plans (Chapter 8); present a description of the recommended plan (Chapter 9); present the study recommendation (Chapter 10); list the recipients of the draft feasibility report (Chapter 11); and, a list of references (Chapter 12). A list of acronyms and abbreviations and a glossary of terms precede Chapter 1. An index is at the end of the report.

CHAPTER 2 – NEED FOR AND OBJECTIVES OF ACTION*

The USACE planning process follows the six-step process defined in the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implemental Studies," also known as the Principles and Guidelines (P&G), issued by the Water Resource Council on March 10, 1983 (P&G, ER 1105-2-100). The planning process is a structured approach to problem solving which provides a rational framework for sound decision-making. The six-step process is used for all planning studies conducted by USACE. The first step in the process is the identification of problems and opportunities.

2.1 PROBLEMS AND OPPORTUNITIES

A problem is an existing undesirable condition to be changed. An opportunity is a chance to create a future condition that is desirable. Within the context of solving problems, opportunities contribute to the overall beneficial outcome of the project. The difference between problems and opportunities is often indistinct, but in both cases a changed future condition is preferred. The purpose of the feasibility study is to identify, evaluate, and recommend to decision makers an appropriate, coordinated, and implementable solution to the identified water and related land resources problems and opportunities for Orestimba Creek. The following key problems were identified during the first three steps of the planning process by the study team and concerned stakeholders.

2.1.1 Flooding Problems

Problem: There is a high probability of flooding which threatens public health and safety in the City of Newman and surrounding rural areas.

Flooding in the study area has required extensive emergency operations, including levee construction, evacuation, road closure, monitoring, and traffic control. Flood overflows from Orestimba Creek cause flooding in the town of Newman. Orestimba Creek is located on a broad alluvial fan and floods larger than a 1/3 median ACE event exceed the channel capacity and distribute out over the unconfined floodplain. The topography of the floodplain is shown in Figure 2-1. Flood flows first exceed channel capacity downstream of Jorgenson Road. Although Newman is situated approximately 2.5 miles from the channel, the unconfined flood overflows are diverted along roads, a railroad embankment, and other features into town. This overland flow collects along the uphill (west) side of the CCID Main Canal and the CNRR embankments. Floodwaters are conveyed south along Highway 33 and the CNRR berm, eventually inundating the town of Newman. Flood flow overtops the highway and railroad berm and then continues down slope across fields and farm roads until it reaches the San Joaquin River (Figure 2-2).

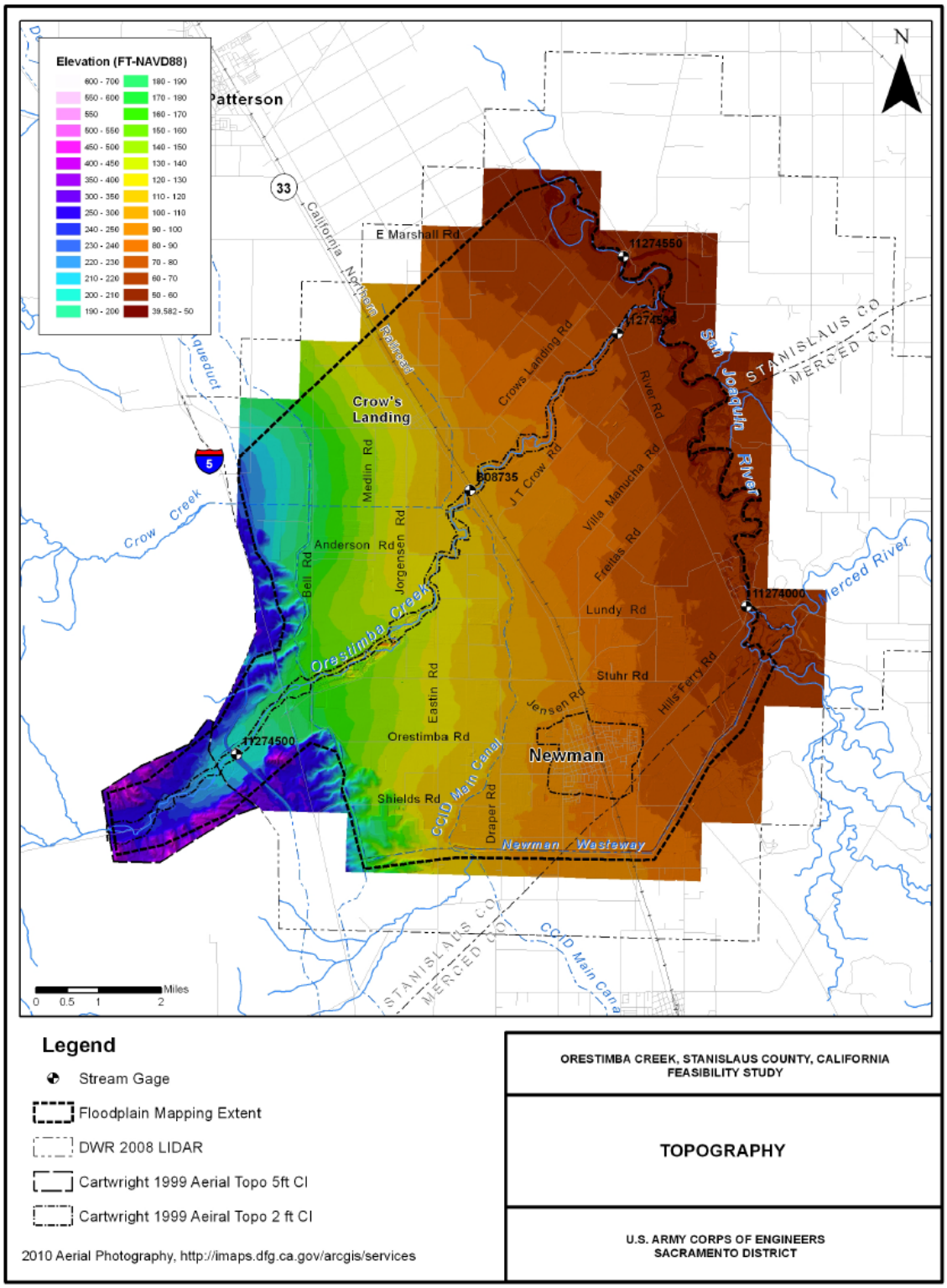


Figure 2-1: Topography of the Orestimba Creek Floodplain

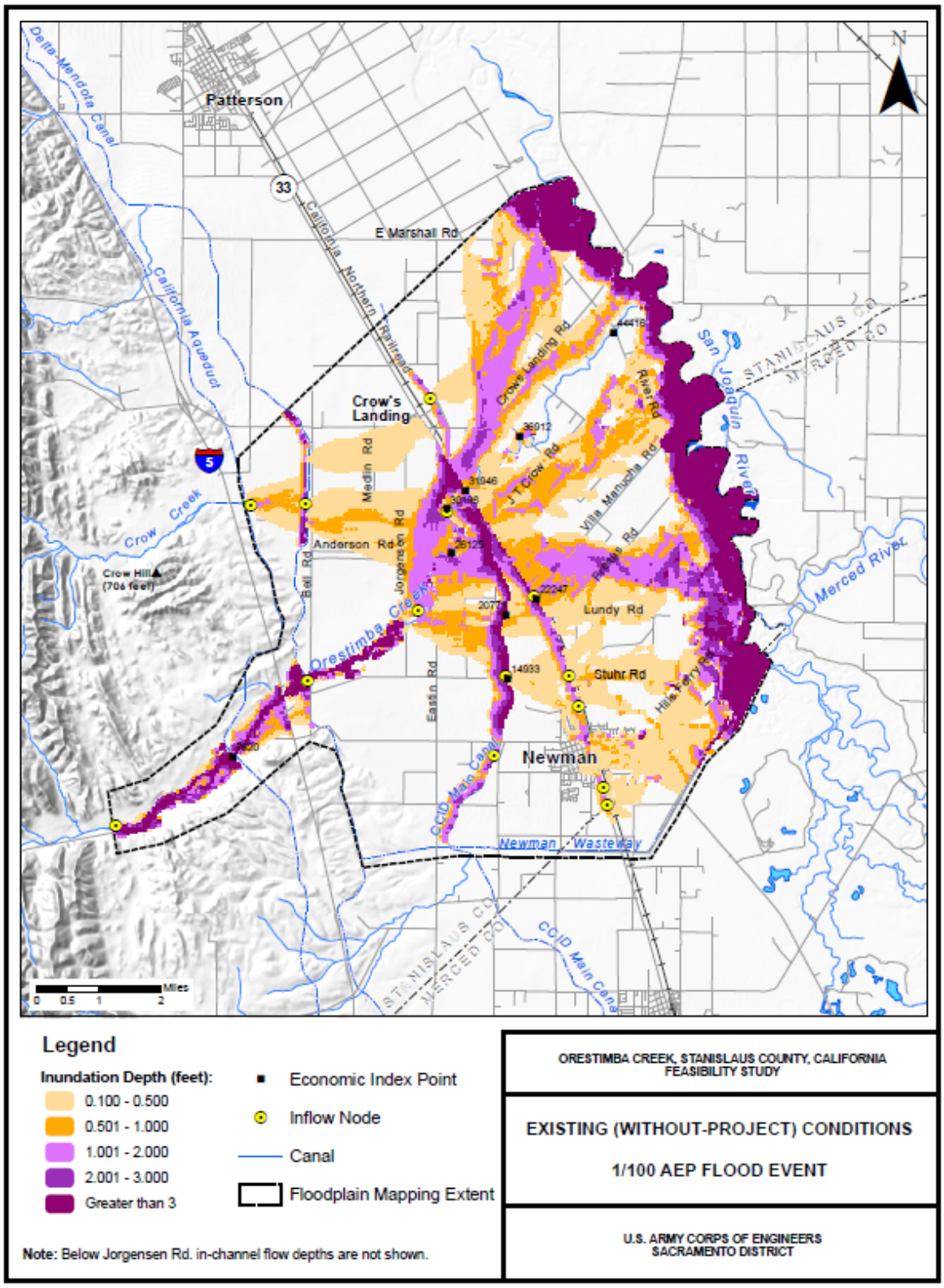


Figure 2-2: Orestimba Creek 1/100 Median ACE Floodplain

It is estimated that floods less than a 1/3 median ACE are confined to the channel, floods between 1/3 median ACE and 1/10 median ACE are located within agricultural areas and floods greater than a 1/10 median ACE reach the town of Newman. The flooding from Orestimba Creek is shallow unconfined flooding as opposed to riverine flooding which could be deeper but would also be confined by topography to a fairly narrow area along a river. Riverine flooding would be like pouring water from a glass into a bowl. A bigger glass would result in approximately the same flooded area but higher water levels. The final location of the water is predictable. With shallow unconfined flooding, it is like pouring water from a glass onto a table. A bigger glass of water equals a larger flooded area but the same water level. The final location of the water is unpredictable. In addition, the Orestimba Creek alluvial fan floodplain is like a tilted table with many agricultural berms and furrows that cause the floodwater to change course and these features change very often making it very difficult to predict exactly where the floodwater will flow.

Stream flow records at USGS Gage 11274500 Orestimba Creek near Newman indicate annual peak flows have exceeded the estimated channel capacity of 1,600 cfs 34 times from 1932 to 2010, while approximately 12 floods exceeded a 1/10 median ACE event and would have reached the town of Newman. The five largest floods from 1932 to 2010 occurred in 1958, 1963, 1986, 1995 and 1998. A comparison of annual peak flows to hydrologic frequency is provided in Figure 2-3.

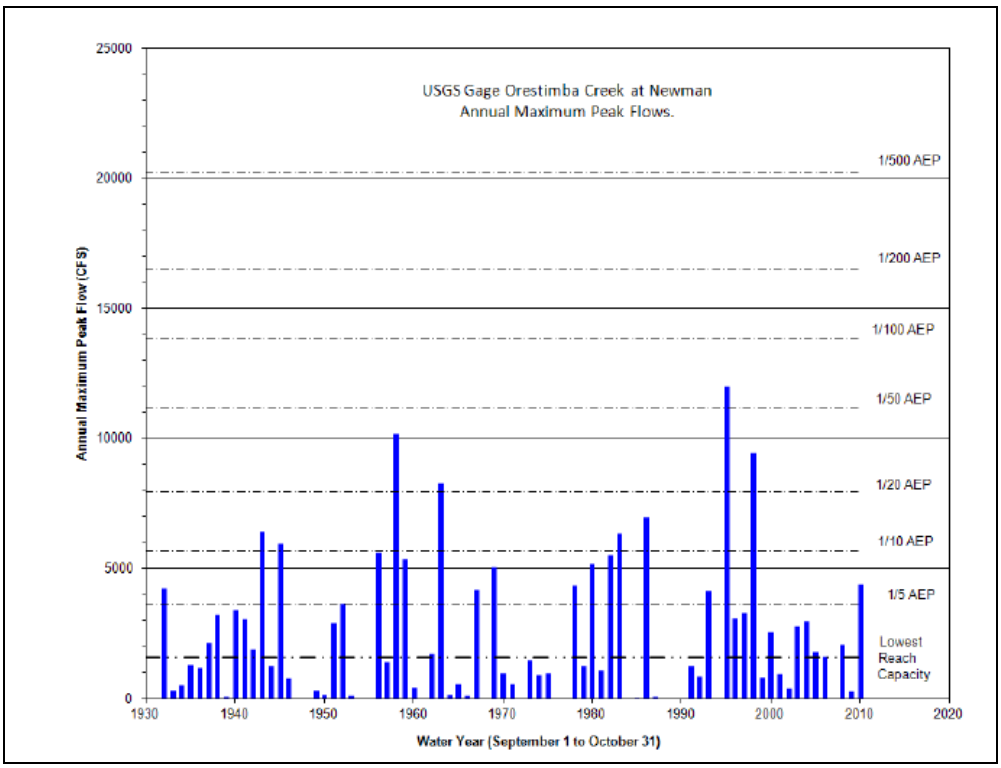


Figure 2-3: Peak Annual Flows - Orestimba Creek near Newman

In March 1995, Newman experienced the worst flood in its 107-year history. On March 10, 1995, the USGS gauge upstream of the California Aqueduct registered a peak flow of 12,000 cfs (Figure 2-4). On the same date, the USGS gauging station Orestimba Creek at River Road registered a peak flow of 2,650 cfs. This shows that significant flood volume was conveyed overland across agricultural fields with a portion of the flow inundating the City of Newman (Figure 2-5). Structures within the town were flooded by over two feet of sediment-laden water. A convalescent hospital located on the north side of the city was entirely inundated by 2 feet of water in the building and 4 feet of water in the parking lot. Sixty-five residents were evacuated by a Medi-Flight helicopter after a failed attempt to use two ambulances and a school bus. Many public streets and highways, including State Highway 33, were closed. These road closures limited or, in some cases, prevented access for emergency vehicles which resulted in diminished local and regional emergency response capabilities. Similar public health risks caused by area flooding included floodwater affected domestic water wells and individual septic systems, many of which were rendered unusable.

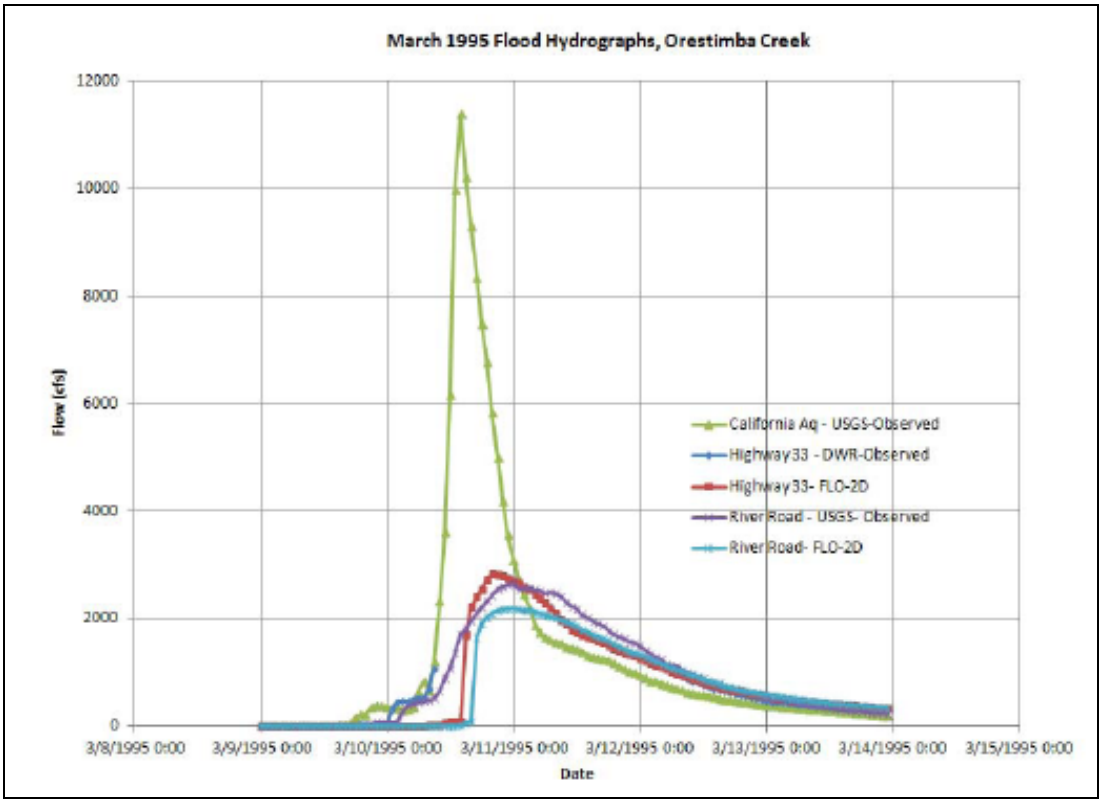


Figure 2-4: March 1995 Hourly Flood Hydrographs, Orestimba Creek

The 3 February 1998 storm event produced the third largest peak runoff of the 1932 to 2007 record (Figure 2-6). The event had a peak flow of 9,470 cfs at the Orestimba Creek at Newman gage and peak flow of 2,340 cfs at the Orestimba Creek near River road gage. Similar to the 1995 event, this shows the substantial volume of floodwaters that was conveyed by the floodplain.

There are three low water crossings of Orestimba Creek where the road dips down into the creek channel and only a small culvert allows the creek flow to pass under the road. When flow in the creek increases beyond what the culverts can contain, water flows up and over the road, easily reaching depths of several feet. These low water crossings at Bell, Jorgenson, and Eastin Roads were identified during the study process as having potentially high risk for anyone needing to cross the creek at these locations. Tragically, in January 2006, a motorist was killed at one of these crossings when attempting to cross the road during high flows in the creek. Subsequently, Stanislaus County installed emergency road closure crossing guards to warn motorists of the danger of crossing the creek at these locations when the water is high.

Figure 2-5: March 1995 Flooding from Orestimba Creek in the City of Newman

Problem: The City of Newman and surrounding agricultural land have incurred damages from past flooding.

Floodwaters have damaged agricultural land and crops, residential and commercial properties, the Delta-Mendota Canal, the CCID Main Canal, bridges, and road crossings. Reported damages from the March 1995 event totaled approximately $7.8 million (2011 prices). A crop storage facility located just north of downtown experienced extensive flood damages that amounted to $500,000 and caused the business to file for bankruptcy shortly after the flood. Damages from the 1998 flood event are unknown. Additional information on the computation of flood damages for this study can be found in Appendix E: Economics.

A structural inventory was completed based on data gathered from the assessor's parcel data and onsite inspection of structures within the flood plain. Table 2-1 documents the potential damageable property within the study area.

Table 2-1: Orestimba Creek Structural Inventory

Economic Impact Area	Residential	Commercial	Industrial	Public	Total
Rural	158	0	0	0	158
Urban	1,122	62	16	7	1,207
Total	**1,280**	**62**	**16**	**7**	**1,365**

The total value of damageable property is comprised of the structural and content values described for the parcels within the 1/500 median ACE flood plain. Table 2-2 shows the total structure and content values by category and economic impact area. In total, the study area has just over $300 million in estimated damageable property.

Table 2-2: Value of Damageable Property within the 1/500 Annual Chance Exceedance Floodplain, October 2011 Price Levels ($1,000s)

Land Use	Structural Value		Content Value		Total
	Rural	Urban	Rural	Urban	
Residential	17,706	123,204	8,853	61,602	211,365
Commercial	0	23,732	0	25,030	$48,763
Industrial	0	13,593	0	20,014	$33,607
Public	0	4,541	0	2,123	$6,664
Total	**$17,706**	**$165,070**	**$8,853**	**$108,769**	**$300,398**

Figure 2-6: February 1998 Flooding from Orestimba Creek in the vicinity of the CCID Main Canal Siphon

Problem: The Orestimba Creek channel has been altered by human activity.

Sand and gravel extraction activities have increased the capacity of the channel between the Delta-Mendota Canal and Jorgensen Road. Reduction of channel slope downstream between Jorgenson Road and Morris Road, with an attendant drop in water velocity, has decreased carrying capacity and increased sediment deposition. This deposition has decreased the sediment supply to reaches of the channel downstream of Morris Road, contributing to down cutting of the channel and exposure of bridge supports. Flow velocities are high enough to move considerable quantities of bed material. The significant transport capacity and reduced sediment load downstream of Jorgensen Road may be the cause of some changes in channel geometry evident in recent years.

In many areas along Orestimba Creek, farming activities have encroached upon the banks of the creek (see Figure 2-7). Riparian vegetation has been removed and it appears that the creek banks have been mechanically altered. Small private levees exist along portions of the creek but there are no levees in the study area belonging to the State or Federal network of levees.

Figure 2-7: Orestimba Creek Downstream of the Railroad Trestle

2.1.2 Opportunities

Opportunity: Reduce the risk of flooding and flood damages through the use of proven environmental design methods for structural and/or non-structural features.

There is an opportunity to reduce the risk to public safety and damages due to flooding from Orestimba Creek.

Opportunity: Sustain and improve aquatic, riparian, and adjacent terrestrial habitats consisting of native plants for use by fish and wildlife.

There is an opportunity to sustain and improve the ecosystem along Orestimba Creek because remnants of the native habitat still exist and could be expanded.

Opportunity: Reduce the risk of flooding and flood damages through the least environmentally damaging structural or non-structural method.

There is an opportunity to reduce the risk to public safety and damages due to flooding from Orestimba Creek.

Opportunity: Restore aquatic, riparian, and adjacent terrestrial habitats consisting of native plants for use by fish and wildlife.

There is an opportunity to restore the ecosystem along Orestimba Creek because remnants of the native habitat still exist and could be expanded.

2.2 OBJECTIVES AND CONSTRAINTS

2.2.1 Federal Objectives

In the Flood Control Act of 1970, Congress identified four equal national objectives for use in water resources development planning. These objectives are: national economic development (NED), regional economic development (RED), environmental equality (EQ), and social well being (OSE, other social effects). These four categories are known as the System of Accounts, whereby each proposed plan can be easily compared to the no action plan and other alternatives. The Federal objective identified in the P&G is:

> "The Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statues, applicable executive orders, and other Federal planning requirements."

In Section 2031 of WRDA 2007, Congress instructed the Secretary of the Army to develop a new P&G for USACE (Public Law 110-114). In an effort to modernize the approach to water resources development, the Obama Administration is expanding the scope of the P&G to cover all Federal agencies that undertake water resource projects. The revised P&G include a number of important changes. These changes are expressed in the following proposed new Federal objectives statement:

> "The national objective of water and related land resources planning is to foster environmentally sound, efficient use of the Nation's resources consistent with public safety. This can be accomplished through watershed analyses that recognize the interdependency of water uses. This is strengthened by capitalizing on a collaborative planning and implementation process which incorporates fully informed participation from Federal agencies, non-Federal interests, non-governmental organizations, State and local and Tribal governments, and a full range of water users and stakeholders."
>
> "Water and related land resources planning that is consistent with the national planning objective seeks to incorporate some or all of these elements: facilitate sustainable national economic development, encourage wise use of water and related land resources – including flood plains, and flood-prone coastal areas, support the protection and restoration of significant aquatic ecosystems, promote the integration and improvement of how the Nation's water resources are managed; and reduce vulnerabilities and losses due to natural disasters."

The Federal objective is not specific enough for the development of a water resource project. The formulation of alternative plans requires the identification of study specific planning objectives.

2.2.2 Non-Federal Objectives

The State of California, recognizing the continuing risk of flooding within the Central Valley, has enacted the Central Valley Flood Protection Act (CVFPA) and other related legislation, which establishes in California law the objective of providing 200 year protection to urban and urbanizing areas. Additionally, the CVFPA requires an immediate analysis of the condition of the system levees, an action plan for achieving the desired level of protection, and associated actions to reduce residual risks to development within the protected area. The State is partnering with Stanislaus County, the study sponsor, to fund the non-Federal portion of the Orestimba Creek Feasibility Study.

2.2.3 Planning Objectives

Planning objectives are more specific than the Federal and non-Federal objectives and reflect the problems and opportunities in the study area; an objective is developed to address each of the identified problems and opportunities. Planning objectives represent desired positive changes in the without-project future conditions. All of the objectives focus on activity within the study area and within the 50 year period of analysis.

The planning objectives are:

- Reduce the probability of Orestimba Creek flooding in the study area consistent with existing land use patterns.
- Reduce the consequence of flooding in the study area with an emphasis on public safety.
- Include environmentally sustainable design during construction of the recommended plan.
- Increase natural functions of Orestimba Creek as an incidental benefit while reducing flood risk in the study area.

2.2.4 Planning Constraints

A planning constraint is a restriction that limits the extent of the planning process. It is a statement of things the alternative plans must avoid. Constraints are designed to avoid undesirable changes between without and with-project future conditions.

The planning constraints are:

- Comply with all applicable Federal laws, regulations, and policies.
- Avoid adverse effects to Federal and California State listed species in the area including the Valley Elderberry Longhorn Beetle (VELB) and the San Joaquin Kit fox.

2.3 INVENTORY AND FORECAST OF FUTURE WITHOUT PROJECT CONDITIONS

The future without project condition is the most likely condition expected to exist in the future in the absence of a proposed water resource project. The future without project condition defines the benchmark against which the alternative plans are evaluated. While most of the documentation of the inventory and forecast of affected resources is located in Chapter 4, a few critical assumptions that affect the plan formulation have been highlighted in this section.

Critical assumptions in defining the future without project conditions include:

- Habitat diversity and quality along Orestimba Creek are anticipated to decrease in the future. There are currently no known plans to restore and preserve land within the lower watershed and on the alluvial fan surface.
- Flood events would continue to erode the bed and banks of Orestimba Creek, removing vegetation, causing banks to collapse, and threatening infrastructure. This condition is usually addressed with the placement of broken concrete or rock, which has little to no habitat value. A decline in resource values within the creek and adjoining properties may be expected to continue in the future.
- Sand and gravel mining within Orestimba Creek would continue to reduce the amount of sediment transported by the creek to downstream reaches causing the creek channel to become further incised. This has tended to be accompanied by a general narrowing of the channel historically. Channel velocities may increase slightly with the deepening and narrowing of the channel, which may allow for an increase in sediment transport capacity. The creek sinuosity and meander-width ratio may also change as the channel system continues to adjust to changing sediment-input conditions.
- The City of Newman and surrounding agricultural areas would continue to accrue flood damages. Expected annual damages are approximately $3,400,000.
- The City of Newman and surrounding agricultural areas would continue to be at risk of flooding from Orestimba Creek.
- Hydrology would not substantially change. The study area would primarily remain non-urban so runoff would not increase. The potential impacts of climate change are estimated to be more significant in the without project condition than with the proposed project. This is because the damages with the project in place were found to be relatively insensitive to peak flow. As a result, the benefits of the

project would be under estimated if flood magnitudes were to increase in the future.

- There would be limited development within the urban area.
- Critical infrastructure, including the California Aqueduct, the Delta-Mendota Canal, the CCID Main Canal, Highway 33, the CNRR, and the existing county roads would remain in place.

Existing Non-Structural Features

There are a number of small non-structural features that have been constructed by private landowners or local or regional governments to reduce the consequences of flooding in the study area. It is assumed that all of these features would remain in place in the future without project condition.

As discussed above in Subsection 2.1.1, there are three low water crossings of Orestimba Creek where the road dips down into the creek channel and only a small culvert allows the creek flow to pass under the road (Figure 2-8). It is assumed that these crossings would remain in the future without project condition.

Figure 2-8: High Water Road Closure on Eastin Road

Several other examples of non-structural approaches to flood risk management exist in the study area. Several floodwalls and small berms have been constructed to prevent floodwater from entering rural residences. (Figure 2-9)

Figure 2-9: Flood Wall Risk Reduction Measure at a Rural Residence near Orestimba Creek

CHAPTER 3 – ALTERNATIVE PLANS*

This chapter, Alternative Plans, includes the main activities of the plan formulation process. The formulation, evaluation, and comparison of alternative plans comprise the third, fourth, and fifth steps of the USACE planning process. These steps are often referred to collectively as plan formulation. Plan formulation is a structured and highly iterative process that involves cycling through the formulation, evaluation, and comparison steps many times to develop and refine a reasonable range of alternative plans. Those plans are then narrowed down to a final array of feasible plans from which a single plan can be recommended for authorization and implementation.

3.1 FLOOD RISK MANAGEMENT MEASURES

A measure is a feature or an activity that can be implemented at a specific geographic site to address one or more planning objectives. Table 3-1 lists the preliminary management measures identified for the feasibility study and identifies the individual objectives to which they contribute.

Measures are the building blocks that are grouped together to form alternative plans. The measures listed below were screened to determine whether each measure should be retained for use in the formulation of alternative plans. Descriptions of the measures and the decision to retain or drop each measure from further consideration are presented next.

These measures primarily achieve flood risk management objectives in the study area, but may also contribute to the environmental quality objectives through sound environmental design of the project. Flood risk management measures can be nonstructural or structural. Nonstructural measures reduce flood damages without significantly altering the nature or extent of flooding. Damage reduction from nonstructural measures is accomplished by changing the use of the floodplains, or by accommodating existing uses to the flood hazard. In contrast, structural measures alter the nature or extent of flooding. Structural measures accomplish flood risk management by modifying the magnitude, duration, extent, or timing of flooding.

When considering if there are opportunities to apply flood risk management measures in the study area, an understanding of the basic magnitude of costs to construct the measures is useful when compared to the maximum potential flood risk management benefits possible. Reduction in flood damages translates into monetary benefits that are used to determine if the benefits of doing something outweigh the costs, which in turn helps determine if the Federal government can participate in a project. For a frame of reference, the maximum flood risk management benefits possible in the Orestimba area would not economically justify flood risk management measures exceeding about $70 million in total costs.

Table 3-1: Initial Screening of Management Measures and Their Effectiveness in Meeting Planning Objectives

General Measures	Objectives			
	Reduce flood risk	Reduce flood damages	Promote Sustainable Environmental Design	Increase natural functions
Early Flood Warning & Evacuation	x	x		
Raise/Floodproof Community	x	x		
Raise/Floodproof Individual Structure		x		
Dry Floodproof Individual Structures		x		
Relocate Community	x	x		
Relocate Individual Structures	x	x		
Acquire Easements or Fee Title in Floodplain Lands	x	x		
Create Bypass Channel	x	x		
Enlarge Orestimba Creek Channel	x	x		x
Construct Standard Levees	x	x		
Construct Setback Levees	x	x		
Construct Chevron Levee	x	x		
Construct Upstream Floodwater Attenuation Basin	x	x		
Construct Downstream Floodwater Attenuation Basin	x	x		
Construct Training Dike	x	x		
Remove Orestimba Creek Channel Constrictions	x	x		x
Use Canals for Flood Conveyance	x	x		
Use Farm Drains for Flood Conveyance	x	x		
Clearing and Snagging	x	x		
Restore Native Vegetation			x	
Removal of invasive plant species[1]			x	

[1] The only invasive species of concern identified in the report is the Giant Reed Bamboo (*Arundo donax*) which is limited to the creek channel.

3.1.1 Non-Structural Measures

Early Flood Warning and Evacuation

Retained for further consideration. This measure would involve the development of an emergency response plan for the watershed. An emergency plan would contain instructions as to where and when residents should be informed as to potentially dangerous situations, how public agencies should respond to a potential flood emergency, what roads might be blocked off to prevent residents from driving into dangerous water crossings, & other information that would assist in an orderly response to the problem. Installation of stream gages and rain gages connected to an electronic system could also help to warn residents of the floodplain as to an impending flood. This would allow residents some time to remove limited household property to a safer location prior to a flood event. Flood warning systems can be integrated into a larger flood response plan, potentially in conjunction with evacuation plans. Stanislaus County has installed automated closures at 3 road crossings to reduce the chance that drivers would attempt to cross the creek when it is flooded.

Raise/Floodproof Community

Dropped from further consideration. There is little community support for this measure as the method of reducing flood damages. This measure reduces the threat to public safety within the community but the flood risk remains in the rural areas. This measure is not cost effective on a large scale, based upon the current number of structures within the floodplain. The current number of structures within the floodplain ranges from 1,300 to 2,000. At an average cost of $65,000 to raise each structure, the total cost of this measure would fall between $90 and $130 million.

Raise/Floodproof Individual Structures

Retained for further consideration. This measure would involve the raising of individual structures above the level of floodwater reached during a flood event. Each structure would be elevated sufficiently to prevent floodwater intrusion into the structure. Commonly, the structure would be raised and a new foundation constructed beneath it at a higher elevation. This could be a cost effective solution since the floodwater is relatively shallow. This measure would not appreciably reduce flood risk since these individual structures would be isolated during high water events and transportation to and from the structure could be dangerous.

Dry Flood Proofing Around Individual Structures

Retained for further consideration. Dry flood proofing involves sealing building walls with waterproofing compounds, impermeable sheeting, or other materials, and using shields for covering and protecting openings from floodwaters. In areas of shallow, low velocity flooding, shields can be used on doors, windows, vents, and other building openings. Dry flood proofing should be employed on buildings constructed of concrete block or brick veneer on a

wood frame. Weaker construction materials, such as a wood frame, will fail at much lower water depths from hydrostatic pressure. This measure could be employed by individual property owners to reduce flood damages.

Relocate Community

Dropped from further consideration. There is little community support for this measure as a method of reducing flood damages and it is not cost effective on a large scale, based upon the current number of structures within the floodplain. The current number of structures within the floodplain ranges from 1,300 to 2,000. At an average cost of $150,000 to relocate each structure, the total cost of this measure would fall between $200 and $300 million.

Relocate Individual Structures Subject to Flooding

Retained for further consideration. This measure consists of relocation by physically moving existing homes and structures that lie within flood-prone areas. There are cases where relocation is not physically and/or economically feasible. In such an event, property owners would be compensated for the value of buildings and urged to move from the flood-prone area. A successful evacuation and resettlement program requires adequate flood-free replacement housing, nonresidential sites, and the willingness of the residents to participate. Many residents depend on the land for their living and cannot be located at distance from the land that they must maintain daily.

Acquire Flowage Easements or Fee Title Interest in Floodplain Lands

Retained for further consideration. Acquiring flowage easements or purchasing lands in fee title to allow flooding and limit future development can reduce flood damages and provide opportunities for improved environmental quality. The availability of willing sellers is uncertain for some potential project lands.

3.1.2 Structural Measures

Bypass Channel

Retained for further consideration. This measure would involve the construction of a channel downstream of the fan apex that would serve to convey excess flows (flows of a magnitude beyond that which can be accommodated by the existing channel) safely down the fan to the San Joaquin River. The bypass channel would consist of a newly constructed channel that would only convey flow when the existing channel exceeded the maximum flow rate possible without breakout. This measure has the potential of routing floodflows from the upper part of the watershed through the affected properties on the fan to a safe discharge location. A channel capable of conveying up to the 1/100 median ACE event would be potentially five to six times the width of the existing channel in its narrowest locations. The

channel would have to occupy a topographically low point on the fan to make best use of its potential.

Channel Enlargement

Retained for further consideration. This measure would involve the enlargement of the existing channel, entirely below the existing level of the floodplain, through excavation for additional capacity. The existing channel would be widened throughout its length between the fan apex and the San Joaquin River. Additional rights-of-way would need to be acquired through the purchase of property from existing landowners. This land would be required to construct the additional channel width. The channel enlargement would also require the replacement of approximately a dozen bridges, which would greatly increase the project cost. The goal of this measure would be to accommodate any excess flow within the Orestimba Creek channel, such that breakouts would not occur up to events beyond the design level. A channel like this could be constructed to almost any dimension. This measure has the potential of routing floodflows from the upper part of the watershed through the affected properties on the fan to the river. A channel capable of conveying all flows up to 1/100 median ACE event could be potentially six times the width of the existing channel in its narrowest locations.

Levees Along Creek

Dropped from further consideration. This measure would involve the construction of earthen levees adjacent to the channel throughout its length between the fan apex and the San Joaquin River. Additional rights-of-way would need to be acquired by purchase of property from existing landowners. This land would be required to construct the levees on top of the existing channel banks. Construction of standard levees immediately adjacent to the channel would likely cause significant environmental effects to existing riparian habitat along the channel without creating opportunities for habitat replacement. Construction of these levees would also require the replacement of approximately a dozen bridges, which would greatly increase the project cost. Standard levees would also require a substantial amount of rock to be placed on the waterside of the levee to reduce the risk of erosion to the levee. The requirement for rock on the levee makes this measure cost prohibitive. Initial cost estimates for the standard levees ranged between $70 and $100 million, which exceeded the potential benefits of this measure.

Setback Levees

Retained for further consideration. This measure would involve the construction of earthen levees on either side of the channel, where needed, to contain flows between the fan apex and the San Joaquin River, but at some distance from the existing channel. This type of levee would create additional capacity without the height requirement needed for traditional levees, while allowing limited inundation of the floodplain in areas on either side of the channel and contribute to improve environmental quality. In addition, the setback levees would be less

susceptible to failure due to bank erosion. Additional rights-of-way would need to be acquired by purchase of property from existing landowners. These lands would be required to construct the levees at some distance away from the existing channel banks. Constructing a setback levee could reduce flood risk and flood damages. Early analysis efforts indicate that it is not likely cost effective for a single-purpose flood risk management project. However, construction of a setback levee would provide an opportunity to restore riparian and other floodplain habitat along the creek. Construction of any levee would include acquiring a flood protection easement for the levee itself and flowage easements for land on the waterside of the levee.

Chevron Levee

Retained for further consideration. This measure, and variations also known as "ring levees", would involve the construction of an earthen levee on the upstream side and flanks of the town of Newman. This measure would protect the town of Newman from flows up to a design-level event. The levee would divert flow away from the town and down a less developed flow path toward the San Joaquin River. This measure would require a right-of-way on which to construct the levee. The chevron levee would require the raising of roads and some other features to accommodate the levee's increased height above the natural ground. This measure would reduce the risk of flood inundation in the City of Newman and agricultural areas east of town, but would not reduce the flood risk to surrounding agricultural land to the north and west of town. This measure may result in increased flow depths in those areas currently inundated that are outside of the proposed levee confines. These increased depths would be analyzed to determine effects and if a takings analysis would be required.

Upstream Floodwater Detention Basin

Retained for further consideration. This measure would involve the construction of a floodwater detention basin upstream of the California Aqueduct. The basin would be created by constructing a dam embankment across Orestimba Creek, which would create a flood pool in the upstream valley. A floodwater detention basin reduces peak discharges by temporarily storing floodwaters in the flood pool by restricting discharge through an outlet. As no gated control structure would be constructed, flow downstream would be entirely a function of the outlet size and depth of water/volume (head) stored behind the dam. A floodwater detention basin may retain some sediment delivered during large flood events, but would retain no more than the existing condition under lesser flow events. A floodwater detention basin may cause impact to the Sycamore Alluvial Woodland within the inundation area of the flood pool. Four versions of this measure were developed and analyzed to determine which version provided the most benefits for the least cost. The four versions are:

- 2,000 cfs Outlet. This version would involve the construction of a floodwater detention basin with an outlet capable of passing 2,000 cubic feet per second (cfs). An outflow of 2,000 cfs would allow the majority of flood events to pass through the outlet while not exceeding existing downstream channel capacity. This means that all flows up to

approximately 2,000 cfs would be routed through the structure without detention or storage of floodwaters. The time of detention would be very short for smaller flood events, but could extend up to several days depending on the design flood event applied. A structure that would retain a 1/100 ACE median design flood event would be 40 to 50 feet in height. Events larger than design would be routed over a spillway crest at the top of the embankment. This version of the floodwater attenuation basin would require a storage volume of over 20,000 acre-feet to detain the 1/100 ACE median design flood outflow within the existing downstream channel capacity.

- 4,000 cfs Outlet. This version would involve the construction of a floodwater detention basin with an outlet capable of passing 4,000 cfs. This means that all flows up to approximately 4,000 cfs would be routed through the structure without detention of floodwaters. Because the existing channel downstream of the structure is incapable of passing 4,000 cfs within its banks, this version would require the enlargement of the channel in constricted locations to provide a uniform capacity of 4,000 cfs or more in the downstream reaches. The time of detention could extend up to 72 hours depending on the design level applied. A structure that would contain a 1/100 median ACE design flood event would be 30 to 40 feet in height. This version of the floodwater attenuation basin would require a storage volume of somewhat less than 20,000 acre-feet to contain the 1/100 median ACE design flood outflow within the improved downstream channel.
- 8,000 cfs Outlet. This version was created to minimize effects to Sycamore Alluvial Woodland, both at the head of the fan upstream of the California Aqueduct, and also in the riparian zone between the California Aqueduct and Delta-Mendota Canal downstream. This version maintains the extent, frequency, and duration of flooding in the riparian zone between the Aqueduct and Delta-Mendota Canal, and minimizes changes in the duration of flooding to the Sycamore Alluvial Woodlands at the head of the fan upstream of the California Aqueduct. It also minimizes changes in the behavior of sediment and runoff in all of the Sycamore Alluvial Woodland areas. This 8,000 cfs outlet version would require enlargement of the existing channel downstream of the Delta-Mendota Canal. The Basin would detain flow above 8,000 cfs. The basin embankment would be approximately 38 feet tall at its highest point with a length of over 4,000 feet. The emergency overflow spillway would be approximately 1,000 feet wide and 7 feet high.
- 10,000 cfs Outlet. A basin with a 10,000-cfs outlet would allow discharge into the downstream channel at a flow rate similar to that currently contained in the channel. This alternative would result in minimal changes to channel behavior, sediment content, and in-channel vegetation or habitat effects, as the in-channel flow rate would be almost duplicative of that currently experienced during large flood events. The duration of flow would be increased somewhat due to the increased detention time of floodwaters upstream. The 10,000 cfs outlet basin was also designed to be a “dry” structure. No significant ponding of water would occur in this basin, as all flow that

entered the inundated area behind the embankment would drain out naturally to the channel downstream.

Downstream Floodwater Detention Basin

Retained for further consideration. This measure would involve the construction of a dry detention basin downstream of the Delta-Mendota Canal. Since the topography in this location does not provide the means to contain stored water, this structure would be larger than that of a detention basin upstream of the Aqueduct. The analysis conducted on this measure was also formulated for a structure that would hold water only during times in which the downstream channel capacity would be exceeded. This means that all flows up to approximately 2,000 cfs would be routed through the structure without detention, or "stored" floodflows. The time of detention would be very short for smaller flood events, but would extend up to several days depending on the design level applied. As no gated control structure would be constructed, flow downstream would be entirely a function of the outlet size and depth of water/volume within the structure. The structure, at 1/100 median ACE design event, would require an embankment length of approximately 4 miles and a height of between 40 to 50 feet. A detention basin would require a storage volume of over 20,000 acre-feet to contain the 1/100 median ACE design flood outflow within the existing downstream channel.

Construct Training Dike

Retained for future consideration. A training dike, considerably less costly than a levee due to its size, could be cost effective based on damages prevented. Construction of a training dike would include acquiring a flood protection easement.

Remove Constriction from Orestimba Creek Channel

Retained for further consideration. Analysis of the without project channel capacity indicates the CNRR trestle over the creek increases the probability of overbank flooding due to debris capture. The wooden support piers for the trestle are skewed to the flow of the creek. During high water events, woody debris become lodged on the piers, blocking the flow path of the creek and causing the water surface elevation to rise. Floodwater then overtops the creek banks on the upstream side of the railroad trestle and flows laterally along the uphill side of the embankment into the town of Newman.

Use of Canals for Flood Conveyance

Dropped from further consideration. This measure would involve the use of both the California Aqueduct and Delta-Mendota Canal for floodwater conveyance. Floodwaters would be routed into one or both of the canals for discharge to a safer location, thus preventing overflow into those areas currently at risk downstream. The capacity of the canal would be inadequate to substantially reduce flood risk. In addition, floodwater can carry large amounts of sediment, which would be costly to remove from the water supply facilities. This measure

does not have the support of the agencies which operate and maintain these facilities (State of California, Department of Water Resources and the Bureau of Reclamation). The cost of removing sediment and debris from the drinking water supply for Southern California outweighs the potential local flood benefits.

Use of Farm Irrigation Supply Canals and Drains for Flood Conveyance

Retained for further consideration. This measure would involve the upgrading and interconnection of farm drains into a comprehensive storm water drainage system for flood protection. At a fully developed condition, this measure could be used to route floodwaters away from affected properties and into a system of drains capable of containing large flood events. The canals have limited excess capacity, so the focus would be on dispersing the flows among several canals so that together, they could effectively transport floodwaters. Some of the canals flow along the topographic contour rather than downstream to a point of discharge, so some additional canals would need to be constructed for use in flood flow conveyance.

Clearing and Snagging

Dropped from further consideration. This measure focuses on increasing capacity of the channel through clearance of impediments to flow, including vegetation, organic and inorganic debris, and human-generated detritus. Analysis of this measure indicates that clearing and snagging in the channel would not significantly increase the capacity of the channel. In fact, no reasonable amount of clearing and snagging would be capable of increasing the channel capacity above a level of 1/5 ACE median event (3,630 cfs). Clearance of vegetation and debris would be needed on a regular basis to maintain any expanded capacity. It would also subject the channel to increased probability of bank erosion and channel instability which would threaten agricultural infrastructure. Regular removal of the riparian vegetation growing along Orestimba Creek would have significant negative environmental effects. The maintenance would be expensive and would conceivably require individual permits each and every time it was needed. However, some limited removal of impediments to flow, specifically non-native invasive vegetation, may be required as part of any alternative carried forward.

Restore Native Vegetation

Retained for further consideration. As part of any channel modifications, restoration of native vegetation could be implemented within the context of environmentally sustainable design.

Removal of Invasive Plant Species

Retained for further consideration. As part of any channel modification alternative, the removal of invasive plant species could be included in order to increase habitat value and reduce roughness within the creek. This measure would be accomplished within the context of environmentally sustainable design.

The next step in the plan formulation process is to formulate alternative plans. Table 3-2 summarizes the measures screening process.

Table 3-2: Summary of Management Measures Retained or Dropped

Measures	Retained	Dropped	Reason for Dropping
Non-Structural Measures			
Early Flood Warning & Evacuation	X		
Raise/Floodproof Community		X	Not cost effective to raise several thousand structures.
Raise/Floodproof Individual Structures	X		
Dry Floodproof Individual Structures	x		
Relocate Community		X	Not cost effective or supported by community.
Relocate Individual Structures	X		
Acquire Flowage Easements or Fee Title in Floodplain Lands	X		
Structural Measures			
Create Bypass Channel	X		
Enlarge Orestimba Creek Channel	X		
Construct Levees along Creek		X	Significant environmental effects, need for rock makes this not cost effective.
Construct Setback Levees	X		
Construct Chevron Levee	X		
Construct Upstream Floodwater Attenuation Basin	X		
Construct Downstream Floodwater Attenuation Basin	X		
Construct Training Dike	X		
Remove Orestimba Creek Channel Constrictions	X		
Use Canals for Flood Conveyance		X	Insufficient capacity. Sediment in floodwaters would contaminate water supply.
Use Farm Drains for Flood Conveyance	X		Use network of multiple irrigation canals and drains to disperse flows.
Clearing and Snagging		X	Increased risk of bank erosion and instability. Doesn't significantly increase channel capacity. Environmentally damaging.
Restore Native Vegetation	X		
Removal of invasive plant species	X		

3.2 FORMULATION AND EVALUATION OF PRELIMINARY FLOOD RISK MANAGEMENT ALTERNATIVE PLANS

A preliminary array of flood risk management alternative plans was developed, and evaluated and compared to identify a plan that reasonably maximizes the net benefits (benefits minus costs). This preliminary array of flood risk management alternative plans primarily consists of various upstream and downstream dry dam configurations, bypass alignments, setback levees, a ring levee, and channel modifications.

The retained measures generally needed to be combined with other retained measures in order to develop complete preliminary alternative plans. Table 3-3 illustrates which measures were combined to form the various preliminary alternative plans. While each individual measure contributes to one or more of the flood risk management objectives, most need to be applied in combination with the others in order to provide a complete plan that achieves the multiple objectives identified by the study. A description of each of the preliminary alternative plans follows Table 3-3.

Table 3-3: Inclusion of Measures in Preliminary Alternative Plans

Measures	**Alt 1** Enlarge Channel/ Remove Constrictions	**Alt 2** Setback Levees	**Alt.3** Chevron Levee	**Alt.4** Bypass Channel	**Alt.5** Up-stream Basin	**Alt.6** Down-stream Basin	**Alt. 7** Chevron Levee & Chan. mods	**Alt 8** Chevron. Levee, Chan Mods and IC	**Alt 9 –** Non-Struct.
Early Floodwarning & Evacuation	X	X	X	X	X	X	X	X	X
Raise/Floodproof Individual Structure	X		X				X	X	X
Relocate Individual Structures	X	X	X				X	X	X
Acquire Flowage Easements or Fee Title in Floodplain Lands	X	X	X	X	X	X	X	X	X
Create Bypass Channel				X					
Enlarge Orestimba Creek	X	X			X	X	X	X	
Construct Setback Levees		X			X	X			
Construct Chevron Levee			X				X	X	
Construct U.S. Floodwater Detention Basin					X				
Construct D.S. Floodwater Detention Basin						X			
Construct Training Dike		X	X						
Remove Or. Creek Channel Constrictions	X	X			X	X	X	X	
Restore Native Vegetation	X	X			X	X	X	X	
Removal of invasive plant species	X	X			X	X	X	X	

3.2.1 Alternative 1 – Enlarge Channel – Remove Constrictions

This alternative would enlarge the existing Orestimba Creek Channel below the existing level of the floodplain, through excavation for additional capacity. The existing channel would be widened throughout its length, where needed, between the fan apex and the San Joaquin River. Additional right-of-way would require purchase of property from existing landowners to construct this alternative. The goal of this alternative would be to accommodate floodflows within the Orestimba Creek channel, so that breakouts would not occur up to events beyond the design level. A channel like this could be constructed to almost any dimension. This measure has the potential of routing floodflows from the upper part of the watershed, through the affected properties on the fan, to the river. A channel capable of conveying all flows up to an assumed median 1/100 ACE event would be potentially six times the width of the existing channel in its narrowest locations. The approximate reach of improvements is between Eastin Road and one mile downstream of the Highway 33 Bridge, a distance of about five miles. Alternative 1 is shown in Figure 3-1

Analysis of the without project channel capacity indicates that the CNRR trestle over the creek increases the probability of overbank flooding due to debris capture. The wooden support piers for the trestle are skewed to the flow of the creek. During high water events, woody debris become lodged on the piers, blocking the flow path of the creek and causing the water surface elevation to rise. Floodwater then overtops the creek banks on the upstream side of the railroad trestle and flows laterally along the uphill side of the embankment into the town of Newman. In addition to the railroad trestle, a number of public and private bridges along this reach of the creek also restrict the channel capacity and would need to be replaced.

Alternative Evaluation

This alternative raises concerns about the channel stability downstream of the modifications. From a geomorphic standpoint, this would be a difficult alternative to implement since the creek is still trying to find equilibrium. Extensive modeling would be needed to determine how the channel would react to changes in channel dimensions. In order to handle large flows (median 1/100 ACE event), the channel would have to be excavated to a size about six times its current geometry. Permitting this excavation work would be difficult due to the existing remnant vegetation along the creek, which would need to be removed. The team decided that this alternative as a stand alone alternative would be eliminated but that parts of it could be incorporated in to other alternatives to form a hybrid alternative.

Historically, a natural channel on an alluvial fan would not be large enough to handle the rare very large flows. This alternative would attempt to create a solution that did not naturally occur. In a natural pattern, the creek would carry the flow during most years, but during very high flow years, flow would overtop and spill out across the floodplain.

Figure 3-1: Alternative 1 – Enlarge Channel – Remove Constrictions

3.2.2 Alternative 2 – Setback Levees along Orestimba Creek

A "setback" levee is a levee constructed at some distance from the river or creek channel. In this case, a setback levee would be two roughly parallel structures, one on either side of the channel, set back from the channel banks of Orestimba Creek at a determined distance. Setback levees require more real estate than a standard levee that is close the channel bank, as the area between the levees would be inundated during a flood event, therefore purchase of the property or a flooding easement would be necessary. A setback levee would require some relocation of structures or infrastructure currently close to the channel. A setback levee would require the same physical characteristics as a standard levee due to the chance that the channel may shift to a location closer to the levee.

The Setback Levee Alternative was initially designed to provide a median 1/100 ACE level of flood risk management for the entire floodplain downstream of Bell Road. Reformulation of the setback levee option resulted in the decision to conduct a cost optimization. This was used to determine the most economical spacing of the levees. The width between the levees was set between 200 and 600 feet apart, in 100-foot increments. The results indicated that a spacing of 300 feet between the inside toes of the levees provided the best combination of levee size and land usage.

Setback levee bottom widths were varied between 200 feet and 600 feet, as measured from the inside toes. Levees were generally centered on the existing main channel. Water surface profiles were computed for the median 1/100 ACE event (14,000 cfs) and the median 1/500 ACE event peak discharges (20,000 cfs). Figure 3-2 shows a map of the setback levee alignment.

The levees would extend from the San Joaquin River confluence to a point where most of the flow is contained within the main channel just below the Delta Mendota Canal. The overall leveed channel length would be approximately 10 miles. For simplicity, it was conservatively assumed that the levee length on both sides of the creek is equivalent to the channel length. There would likely be sections where bends within the creek would be contained within a less sinuous levee alignment.

The modified reach includes 10 bridges. It is assumed that all of the bridges would be modified to span the distance between levees to provide all weather crossings.

Alternative Evaluation

This alternative would include a high level of land acquisition depending on the distance of the setback levees. The preliminary cost estimates indicated that this would be a very expensive alternative to implement compared to other alternatives, mostly due to the number of bridges that would have to be replaced.

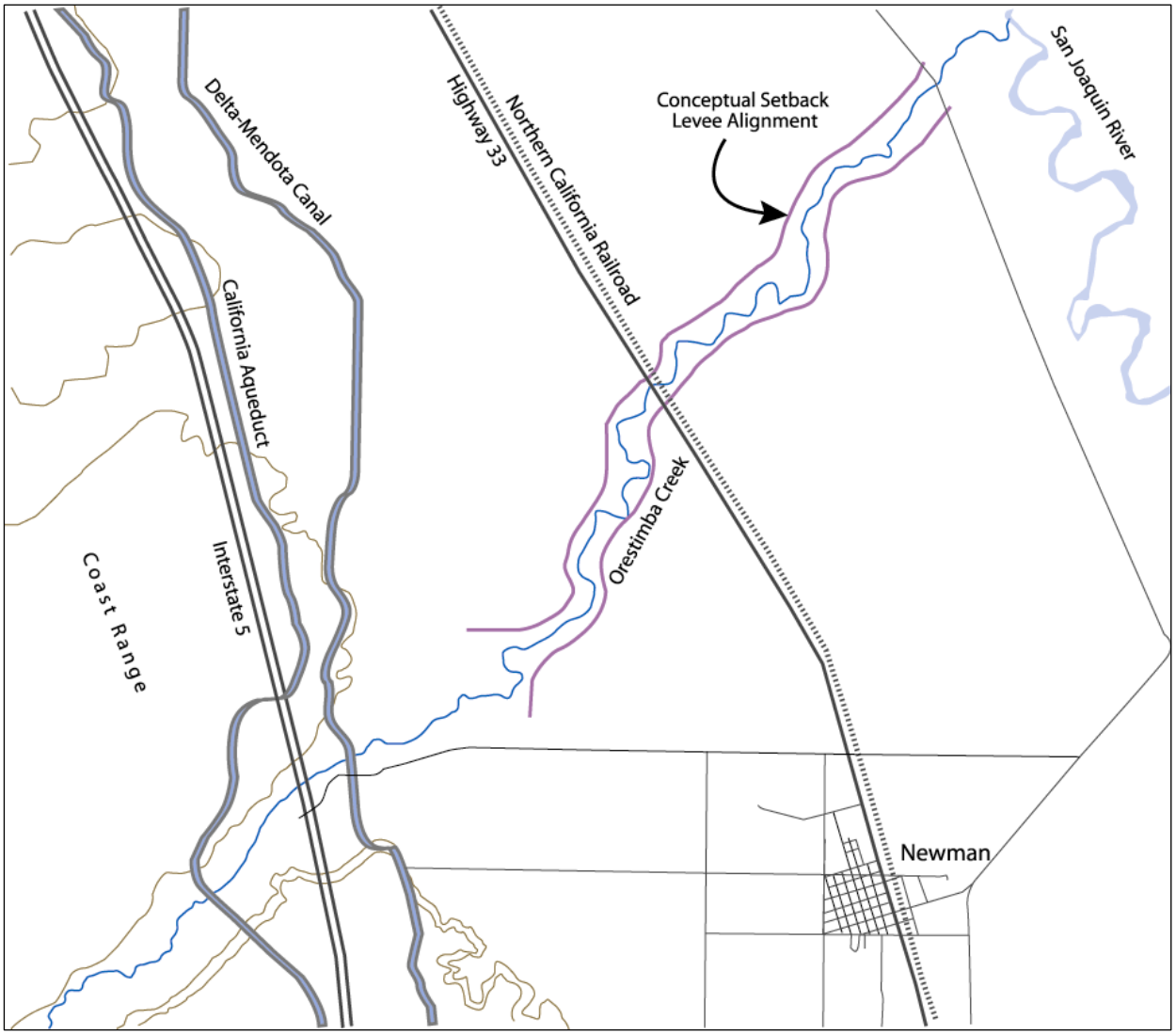


Figure 3-2: Alternative 2 – Setback Levees along Orestimba Creek

3.2.3 Alternative 3 – Chevron Levee

A partial ring levee would be constructed to reduce the risk of flooding to the majority of structures within the City of Newman. The levee would be somewhat horseshoe-shaped, with the open end facing downstream (toward the San Joaquin River). It would divert floodflows that flow overland across the alluvial fan around the City of Newman.

The Newman Chevron Levee Alternative protects the town of Newman from flows that break out of the channel of Orestimba Creek. As shown in Figure 3-3, the levee would start near Highway 33 about 1 mile north of the town, near an unnamed farm road. It would continue to the west in the direction of the CCID Main Canal, and then would run south in a parallel alignment to the canal until it intersects with the Newman Wasteway. The team also designed an alignment with the northern portion of the levee paralleling Stuhr Road. This alignment proved to be more costly than the northern farm road because of the numerous utilities and residences along Stuhr Road that would be affected.

Alternative Evaluation

Given its location outside the channel area of Orestimba Creek, it is anticipated that most effects of the chevron levee would be cultural and social, rather than environmental.

The addition of the chevron levee creates a condition of increased flood depth on the water side of the levee since the flow is diverted from its original flow path. This could result in areas experiencing a higher probability of increased depth and extent of flooding. Several features were analyzed in order to reduce this effect. An interceptor channel was analyzed that could capture the flows just downstream of the Railroad berm and convey the flows to the San Joaquin River. The second measure looked at a bypass just downstream of the Delta-Mendota Canal. Both of these features would require extensive real estate acquisitions and were found to cost more than the benefits they provided. Therefore, these features would not be recommended.

The Chevron Levee Alternative is cost effective and reduces damages in the City of Newman and the rural area east of Newman, but does not reduce damages in the remainder of the study area. A hybrid version of this alternative would combine it with setback levees and channel improvements, which would allow the channel to convey more flow than it currently does. This would reduce the flood risk to the agricultural area, while the chevron levee would provide a higher level of flood risk management to the City of Newman.

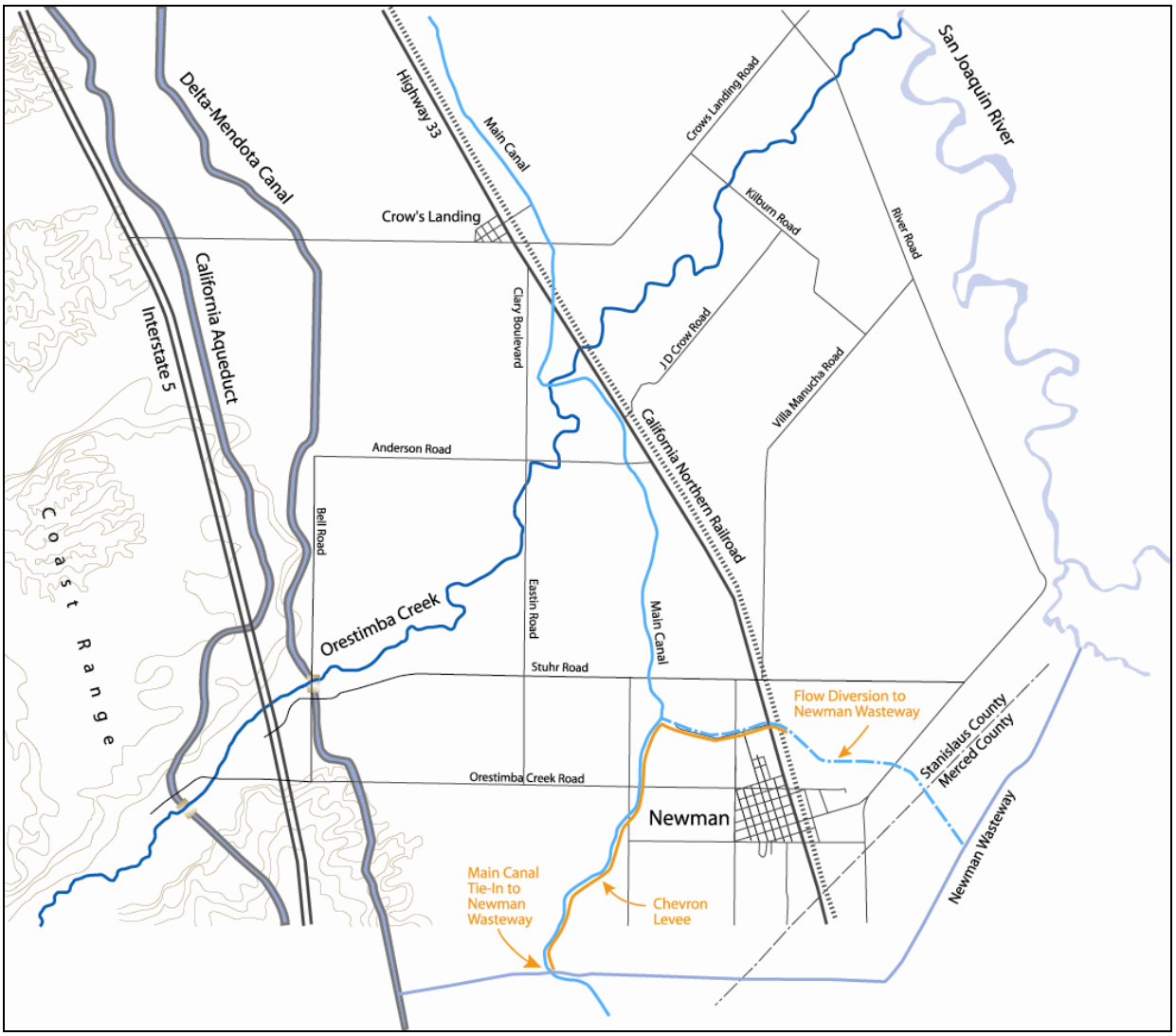


Figure 3-3: Alternative 3 – Chevron Levee

3.2.4 Alternative 4 – Bypass Channel

The Bypass Channel Alternative would mimic the natural flow of floodwaters as they leave the Orestimba Creek channel and spread out on the alluvial fan. This alternative would include the construction of multiple small to midsize channels that collect floodflows and transport them to the San Joaquin River. The bypass channels would be located in the lower half on the alluvial fan where the majority of the flows break out of the creek channel.

As shown in Figure 3-4, six channel alignments were investigated between Orestimba Creek and the City of Newman. The channel alignments were selected to follow general topographic "swales" and to utilize existing agricultural water supply and drainage canals. In some areas, a limited number of new channel lengths would be constructed, and in these cases the alignments would connect existing canals or run parallel to existing roadways to minimize disturbance to existing land uses. Five of the alignments would discharge to the San Joaquin River at three different points. The sixth bypass channel would discharge in to the Newman Wasteway, an overflow channel from the California Aqueduct, which then flows in to the San Joaquin River near the Merced River Confluence.

The channel base widths were selected to optimize channel efficiency and maintain non-erosive velocities to avoid the need for armoring. The channel sizes (bottom widths and depths) and resulting velocities were very similar for each of the alignments. The major difference between the alignments is in the overall channel lengths, which would significantly affect construction costs and impact (channel footprint) areas. This alternative was analyzed to determine the optimal number of bypass channels required and the amount of flow each channel would accommodate. In addition to the construction of the bypass channels, new roadway crossings would also be required for at least some of the existing roads.

The outlets of these channels would concentrate the release of flow to different points along the San Joaquin River. For peak storm events, the current Orestimba Creek floodplain delivers flow to San Joaquin River at a large number of locations with only a small portion of the flood flow actually concentrated in Orestimba Creek at the outlet.

Alternative Evaluation

Alterations to the outlet conditions to the San Joaquin River, either by concentrating the overflow in bypass channels or by changing the location of the outflow, could impact the flow characteristics and habitat along the impacted reach of the river. While the distributed discharge of flow in the without project condition could have localized erosion effects due to the uncontrolled nature of the discharge point, the discharge of high flows at a new location may have effects at that point and downstream. These may include local scour, channel bank erosion, sedimentation within the channel, and vegetation removal by scour effects.

The Bypass Channel Alternative would attempt to control the flows at the point of break out from the creek. Because this is an ephemeral stream with many dry years or years of low runoff, the ideal system would be one in which the natural channel could handle the runoff

during most years, and an auxiliary system could be used in years of heavy runoff. The flood control system could grow as needed. A series of small bypasses that use existing irrigation ditches could form a network of flood flow drainage paths. Each one could be sized for several thousand cfs, and each additional bypass could be put to use as the need arises.

This alternative was found to be infeasible due to its high cost. To achieve substantial reductions in flood risk, the bypass alternative would need to provide a network of significantly sized bypass channels. For example, in order to convey a median 1/100 ACE event, approximately eight additional bypass channels similar in size to the existing creek channel would be required. Due to real estate and construction concerns, in addition to public acceptance, the team did not feel this was a workable option because of the large amount of land that would be required and the numerous features that would need to be constructed.

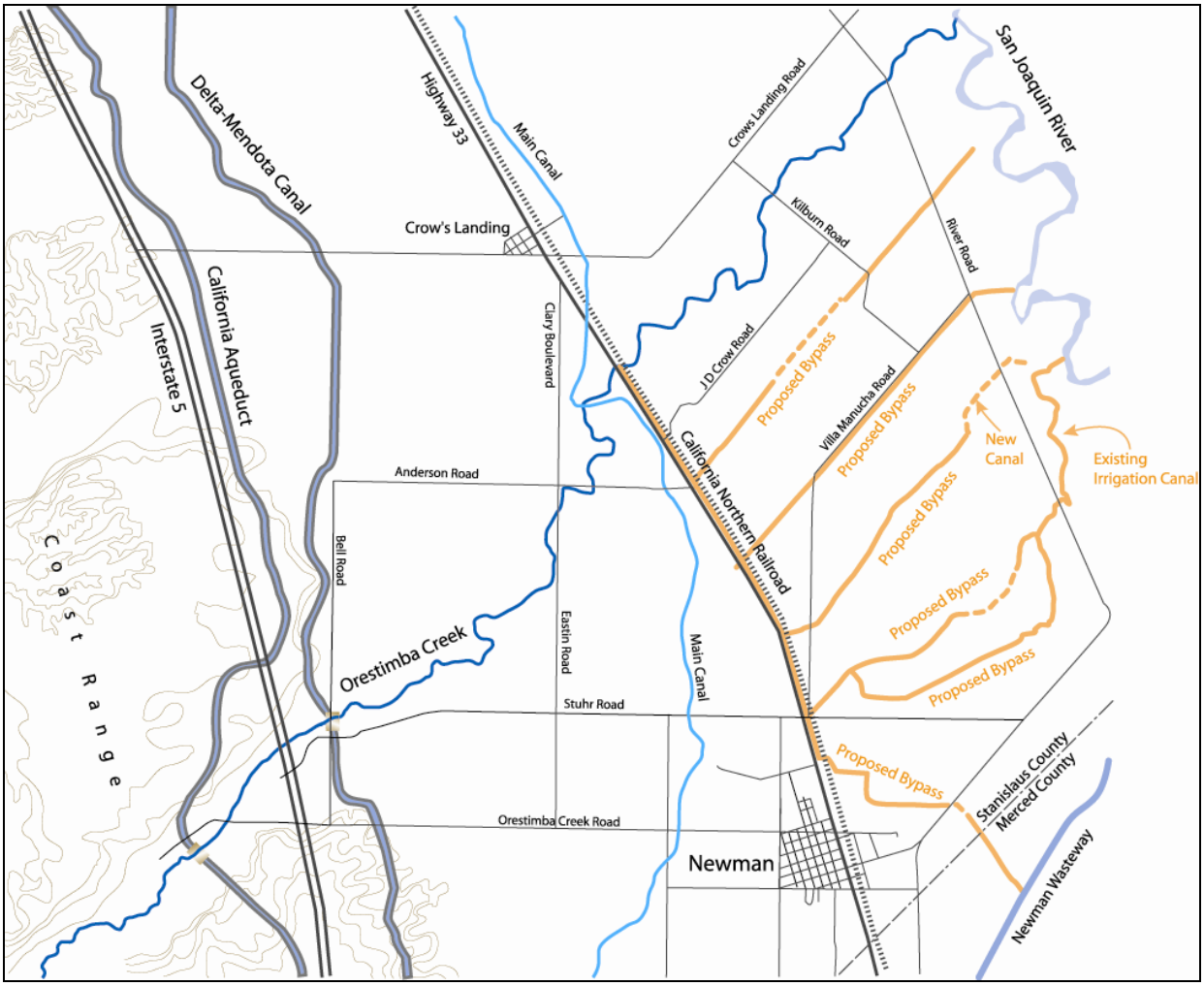


Figure 3-4: Alternative 4 – Bypass Channel

3.2.5 Alternative 5 – Upstream Flood Detention Basin

A floodwater detention basin could be constructed upstream of the California Aqueduct to provide protection from flood events to all properties downstream of the Aqueduct. The site upstream of the Aqueduct is efficient at detaining peak floodflows and releasing the flows at channel capacity. The location within the narrow confines of the hills provides a minimum embankment length for the storage required (Figure 3-5). The floodwater detention basin was designed to be a "dry" structure. Extended storage of water would not occur in this type of basin, as all flow that entered the inundated area behind the embankment would be released immediately following the flood event. No water supply storage was considered. The outlet structure would be ungated. Four versions of this alternative were developed and optimized to determine which version would be carried forward.

Alternative Evaluation

A basin with a 2,200-cfs outlet would allow discharge into the downstream channel at a flow rate similar to that currently contained in the channel. This would minimize any change that would tend to affect channel behavior, sediment content, and in-channel vegetation or habitat effects, as the in-channel flow rate would be duplicated. A basin with a 4,200-cfs outlet would allow discharge into the downstream channel at a flow rate similar to that currently contained in the channel, with enlargement of the channel in certain locations. This would result in greater effects to channel behavior, sediment content, and in-channel vegetation or habitat effects, as the in-channel flow rate would be almost doubled from that currently experienced during large flood events. Basins with an 8,000-cfs outlet and 10,000-cfs outlet were also analyzed but were not carried forward due to the extensive infrastructure and associated costs required downstream.

Potential significant effects may exist, both during and following construction, to the Federally-listed San Joaquin kit fox and California red-legged frog, as well as to the Sycamore Alluvial Woodland at the head of the fan, a CDFG-designated rare natural community. San Joaquin kit foxes are negatively affected by their proximity to the construction and basin/detention pool site. Conservation measures for the kit fox and the California red-legged frog would be incorporated into the analysis of this alternative, should it proceed to the final array of alternatives. The Sycamore Alluvial Woodland would be negatively affected by the removal of some trees at the dry dam construction site, and could be affected by the additional time that the grove would be inundated by floodwater during large flood events. In addition, the Sycamore Alluvial Woodland could be affected by sediment that the floodflows would deposit within the grove, thus affecting surface conditions and subsurface moisture content. Basin reconfiguration was briefly evaluated to determine ways to minimize any significant effects, but no logical alternative was identified. During coordination, USFWS staff communicated their determination that these negative effects to the Sycamore Alluvial Woodland were immitigable.

As the refinement of alternatives continued, it became clear that the costs of constructing a dry dam upstream of the California Aqueduct outweighed the potential benefits. The dam would be required to include a spillway designed to safely pass the probable maximum flood without compromising the integrity of the dam. This translated into a dam that would be 1 mile wide and 60 feet tall. Additional safety concerns were associated with the California Aqueduct, located just downstream from the dam site. The costs of the dry dam approached $75 million, not including mitigation costs. Since other options to protect the City of Newman and the surrounding agricultural land existed, these were examined in detail and the dry dam was not carried forward as part of the preliminary array of alternatives.

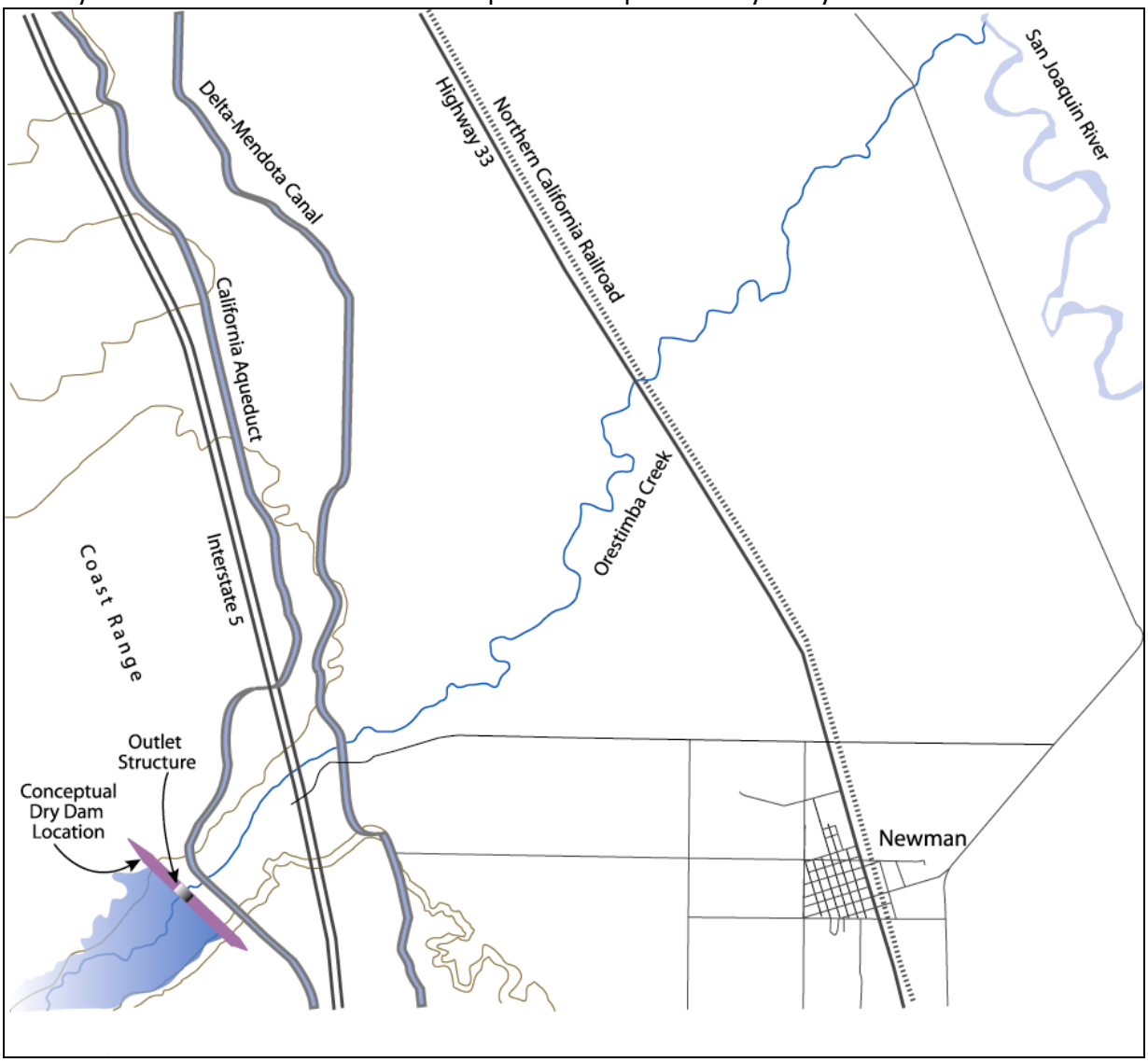


Figure 3-5: Alternative 5 – Upstream Flood Detention Basin

3.2.6 Alternative 6 – Downstream Flood Attenuation Basin

A floodwater attenuation basin could be constructed immediately downstream of the Delta-Mendota Canal and upstream of Jorgensen Road to provide flood risk reduction to properties downstream of that site. The site would require a larger horseshoe-shaped embankment (Figure 3-6). The basin would be designed to be a "dry" structure. Extended storage of water would not occur in this type of basin, as all flow that entered the inundated area behind the embankment would be released immediately following the flood event. No water supply storage was considered. The outlet structure would be ungated.

Alternative Evaluation

The flood attenuation basin would be significantly less cost efficient than the upstream detention basin because of the higher cost of embankment relative to the storage obtained. In addition, the downstream site would require greater real estate acquisitions than the upstream site.

The volume of flow in Orestimba Creek would be increased due to the increased detention time of floodwaters upstream. This increased time of in-channel flow may have effects related to greater amounts of contact time with the water. It would be expected that erosion of the channel could increase, and that water recharge within the channel area would be enhanced. The maintenance of in-channel vegetation would minimize the effects of erosion, and no vegetation removal was considered in this alternative.

This alternative would be located at the site of an existing sand and gravel extraction facility. Coordinated operation of the flood attenuation basin and the sand and gravel extraction facility could be feasible.

Coordination with USFWS staff indicated potential adverse effects, both during and following construction, to the Federally-listed San Joaquin kit fox. Kit fox habitat is located within 10 miles of the construction and basin/detention pool site. Potential impacts would need to be fully investigated under this alternative.

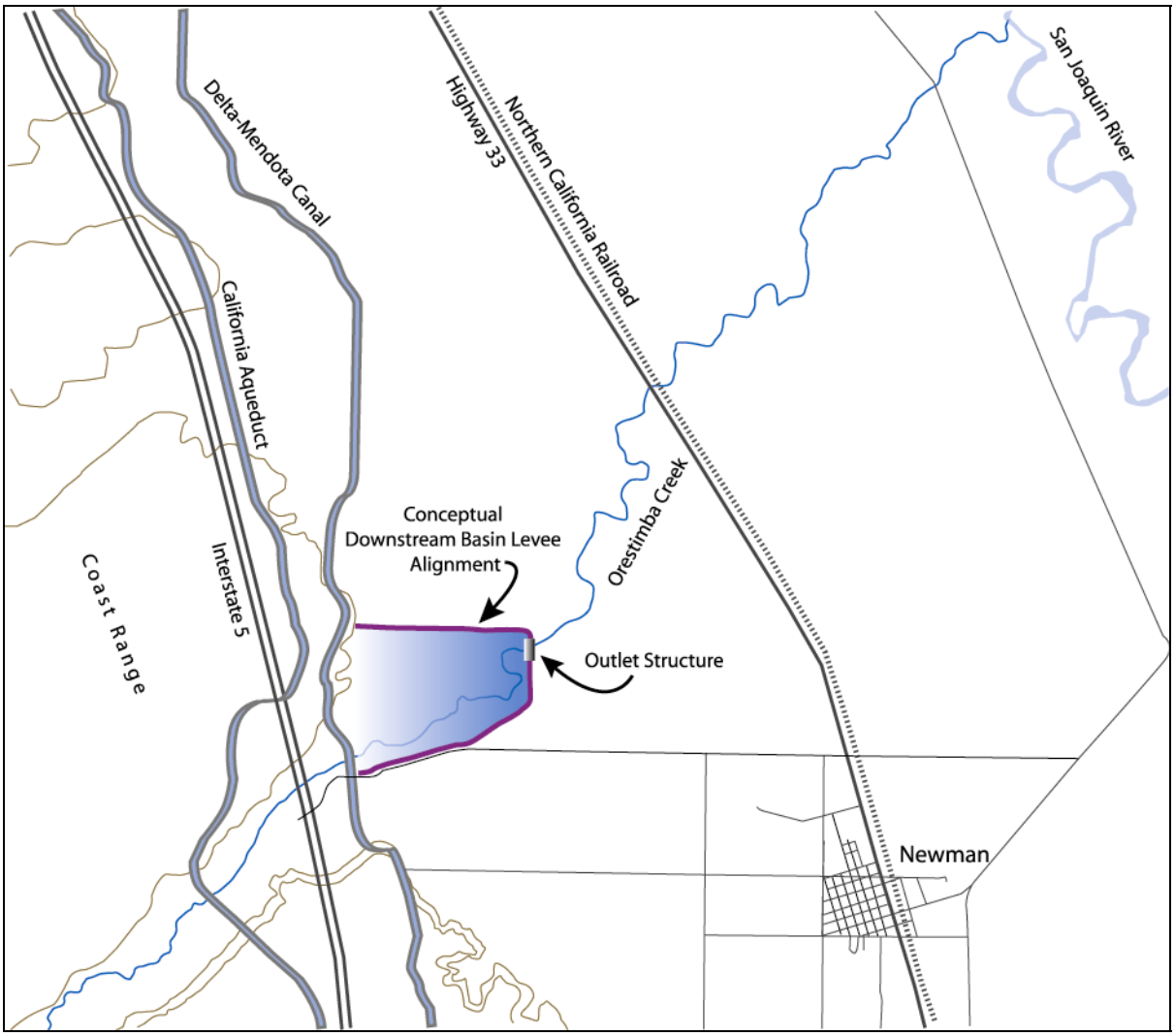


Figure 3-6: Alternative 6 – Downstream Flood Detention Basin

3.2.7 Alternative 7 – Chevron Levee and Channel Modifications

One of the measures identified early in the study process was a chevron levee that would specifically provide flood risk reduction to the City of Newman by directing floodflows away from the urban area. The levee would divert floodflows that break out of Orestimba Creek and flow overland across the alluvial fan. The levee would be comprised of two segments. The first segment of the levee would be constructed north of town along an east-west alignment to intercept floodflows that accumulate along the railroad berm. The second segment would be constructed adjacent to the CCID Main Canal that runs north to south to prevent floodflows from overtopping the canal embankment and flowing into town. Two alignments for the first segment of the Chevron levee were identified: one along Stuhr Road, an existing county road on the northern boundary of the planning area for the City of Newman, and the other alignment about 1 mile north along an unnamed farm road near Lundy Road. These alignments are shown in Figure 3-7. Both alignments would incorporate construction of a levee parallel to the CCID Main Canal.

Stuhr Road Alignment

The Stuhr Road levee would begin where Stuhr Road crosses over the CCID Main Canal. The levee would continue for about 2 miles along the Stuhr Road alignment, ending at the point where floodwaters no longer wrap around the levee and flow in to town. The levee would be constructed just to the north of Stuhr Road and run parallel to it. The levee would intersect both Highway 33 and the CNRR berm, which would both be raised to accommodate the levee. There are numerous utilities along this alignment since it is right at the edge of the urban area. This alignment would require the purchase or relocation of at least seven structures that would be within the levee footprint. This alignment reduced the urban damages, but actually caused an increase of damages to residences located along Stuhr Road east of the CNRR.

Farm Road Alignment

In an effort to reduce the construction costs due to the high amount of utilities and other relocations associated with the Stuhr Road alignment and realize more of the urban benefits near the edge of town, a new alignment was identified along an unnamed farm road located about one mile north of the Stuhr Road alignment. The benefit of locating the levee at this location would be the reduction in overall cost because: (1) less material would be required; (2) there would be fewer utilities to contend with; and (3) re-routing traffic would not be required during construction. Less fill material would be necessary to construct the levee because the top width of this levee would be 12 feet, whereas the Stuhr Road levee width requirement would be 35 feet to replace the existing width of the county road. This alignment allows the levee to tie in to the railroad berm near the location of an existing culvert and natural swale. The probability of induced flooding was found to be less for the farm road levee based on a review of existing condition flood inundation maps.

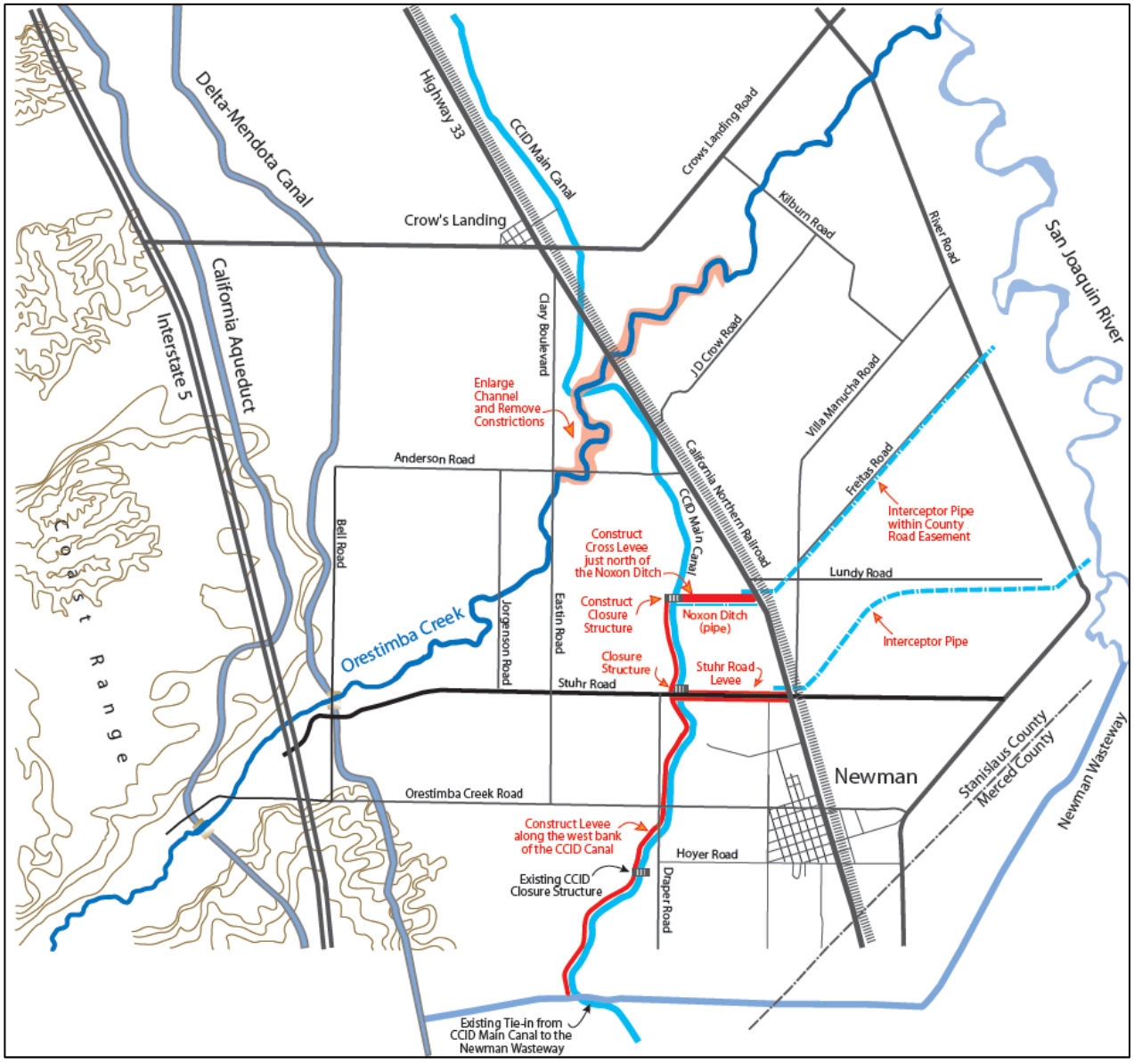


Figure 3-7: Alternative 7 – Chevron Levee and Channel Modifications

Channel Modifications

Construction of a chevron levee reduces damages in the City of Newman and agricultural areas east of town but would not reduce the flood risk to surrounding agricultural land to the north and west of town. In order to reduce the level of flood risk to the agricultural area, modifications to enlarge the Orestimba Creek channel were examined.

The alternative would increase the Orestimba Creek channel capacity between Eastin Road and Morris Road to a capacity similar to the downstream reach. The project would

involve excavating a larger channel cross section and constructing berms along several reaches. The goal of this alternative would be to accommodate flows up to 3,500 cfs within the Orestimba Creek channel; flows higher than this design level would overtop the creek channel and flow overland. The chevron levee would provide the City of Newman with additional flood risk reduction from these overland flows. The approximate reach of the channel modifications is about 5 miles. This increment is shown in Figure 3-8.

The channel modifications target the middle reach of the creek in which the capacity is most constricted (Figure 3-8). Both upstream and downstream the natural channel has the capacity to accommodate larger flows. In order to ensure that the channel modifications do not increase the flood potential for properties along the creek downstream of the channel work, this measure would also include the removal of non-native invasive plant species such as giant reed (*Arundo donax*) which can impede flow in the creek and reduce channel capacity.

Channel stability downstream of the modifications was analyzed to determine how the channel would react to changes in channel dimensions. Large scale channel modification could potentially create instability in the creek. Therefore, the channel modifications were designed to create a sustainable creek channel to optimize the amount of flood water that could be conveyed, while at the same time working within the existing infrastructure constraints such as bridges and siphons.

Historically, the natural channel on the alluvial fan would not be large enough to handle significant flows. The natural flooding pattern would be for the creek to carry the flow most years, and in large flood events high flow would overtop the banks and distribute out across the floodplain. This increment is designed to increase the volume of flow that can be conveyed in the channel, thereby reducing the frequency of flooding in the agricultural area.

Alternative Evaluation

Due to the fact that the chevron levee provided flood risk reduction mainly to the urban area of Newman, there was very little local support for this alternative. The hydraulic and economic modeling of the channel modifications showed that as a stand alone option, it could not provide a high level of flood risk management to Newman. However, when the channel modifications were combined with the chevron levee alternatives, the channel modifications could reduce agricultural damages that the chevron levee alternative could not. By combining these two options into a hybrid alternative, more overall benefits could be achieved. The PDT analyzed several different hybrid options in order to optimize the increments.

As the study progressed in to more detailed design, it became apparent that the channel modifications, in the current design configuration, would not be incrementally justified. The updated cost estimates showed that the channel modifications would be significantly more costly than anticipated at the preliminary design level. The channel modifications provide benefits primarily to the agricultural area. The benefits of reducing flood risk in the agricultural area were about one-half of the costs required to construct the channel modifications. This

means that the channel modifications portion is not incrementally justified and has costs greater than the benefits it provides. Therefore, this alternative was not carried forward to the final array of alternatives.

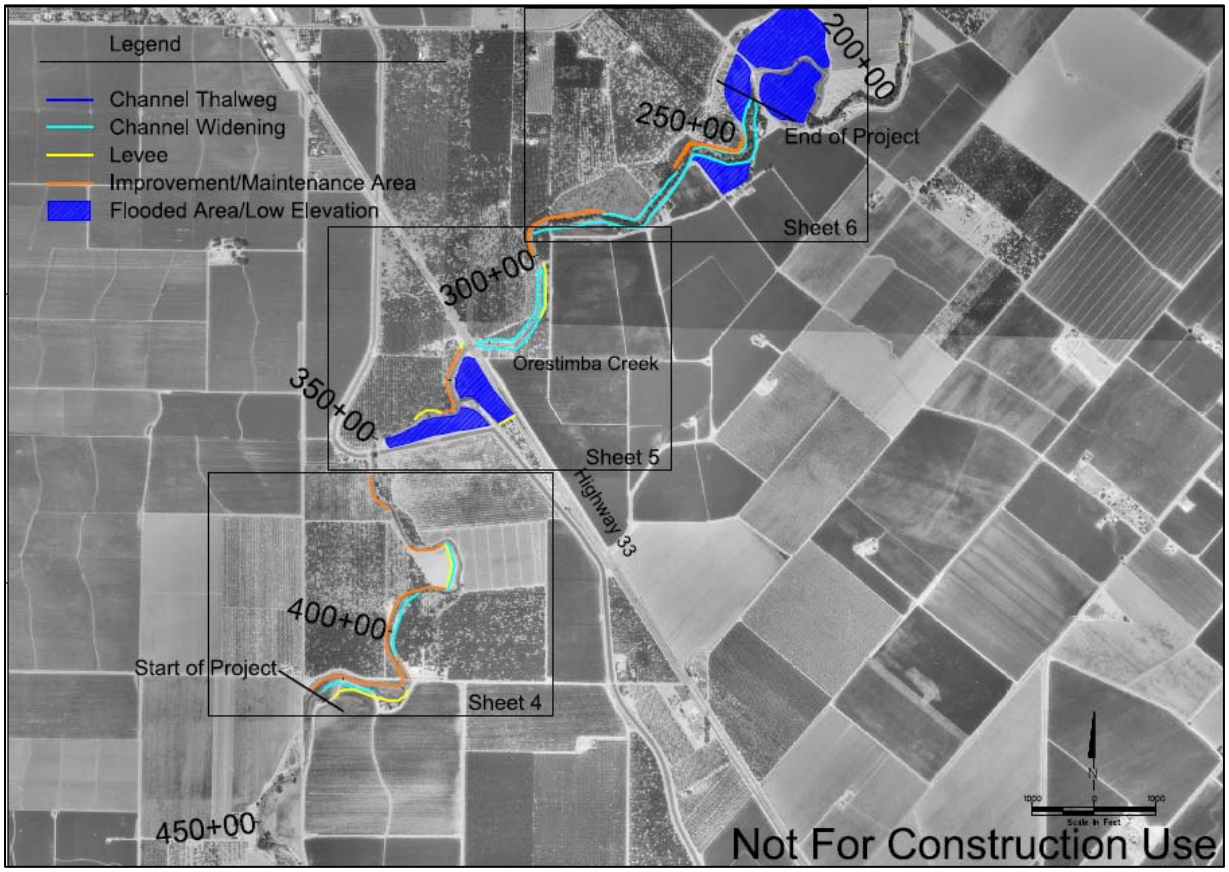


Figure 3-8: Channel Modification Locations

3.2.8 Alternative 8 – Non-Structural Features to Reduce Flood Consequences

The shallow flooding from Orestimba Creek can be effectively managed in part through non-structural measures. Several non-structural flood risk management elements could be added to any of the final array of flood risk management alternative plans to further reduce flood risk and flood damages. Whereas structural project features, such as levees and channel improvements, can reduce the risk of flooding, non-structural features can reduce the consequences of flooding. The combination of both structural and non-structural elements should ideally be used to reduce the flood risk to an area. Figure 3-10 shows this stepped incremental approach to reducing flood risk.

Stanislaus County currently has a floodplain ordinance which restricts development in flood hazard areas as defined by the Federal Emergency Management Agency (FEMA). The floodplain ordinance also specifies building codes for structures in the flood hazard area. Additional non-structural features that could be added to further reduce the consequences of flooding include an advanced warning system based on stream gages at the several points where the creek historically has overflowed its banks. A reverse 911 system could alert surrounding residents of the flood threat, especially if the flood peak occurs during the night, as happened in 1995. Public educational materials could be distributed annually as part of the Orestimba Creek Flood Control District's assessment mailing. The materials should include a floodplain map and description of the nature and type of flooding. The material should also describe the risks of traversing flooded roadways. Informational signs could be placed along roads which alert drivers to the possibility of flooding in the area.

Alternative Evaluation

These features are cost effective and can be implemented as part of any recommended plan.

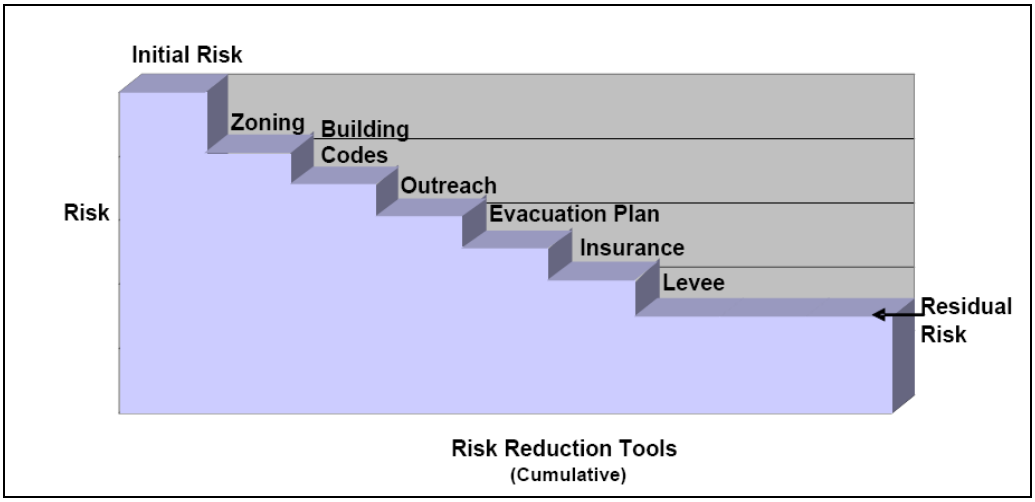


Figure 3-10: Incremental Approach to Flood Risk Reduction

3.3 SCREENING OF THE PRELIMINARY ARRAY OF ALTERNATIVE PLANS

Planning criteria are used to formulate, screen, evaluate, and compare measures and alternative plans. Four specific screening criteria are required in USACE water resource studies: completeness, effectiveness, efficiency, and acceptability. These criteria are generally subjective and are useful in narrowing down the array of possible alternative plans. Other criteria may be identified as well.

Measures and plans that passed the screening criteria were evaluated and compared against more specific evaluation criteria. Evaluation criteria can include costs, outputs, or effects and reflect the planning objectives or constraints. Some or all of the evaluation criteria may be used at various stages in the plan formulation process to compare alternative plans. Effective evaluation criteria must be measurable and reveal differences or trade-offs between alternative plans.

The preliminary alternative plans were screened against the four planning criteria. Standards have been established to determine if the alternative plans meet each planning criteria. The No-Action Alternative plan was not included in this screening process because it must be carried forward in the process in order to serve as the baseline against which all retained alternative plans are compared.

Standards established for each criterion are:

Completeness. To be complete, an alternative must not rely on other activities to function. An alternative plan is either complete or it is not complete. Each alternative plan is considered to be complete.

Effectiveness. An alternative must contribute to at least one of the flood risk management objectives to be considered effective enough to be retained for further consideration. Each alternative plan's ability to meet those objectives is identified in Table 3-4. Each of the alternative plans would meet at least one of the flood risk management planning objectives.

Efficiency. To be considered efficient, an alternative plan must be cost effective. For this screening, all cost effective plans are retained. Cost effective means that for a given level of benefits, no other plan costs less and no other plan yields more benefits for less money.

Acceptability. Acceptability is the workability and viability of the alternative plan with respect to acceptance by State and local entities and the public, as well as compatibility with existing laws, regulations, and public policies. An alternative plan must be considered within these parameters to be a satisfactory way of addressing problems identified. For the purposes of this screening, the question asked is, "In general, do the State, local entities, and public find channel enlargement/removal of constrictions, construction of a flood attenuation basin, flood bypass, setback levees, and/or habitat restoration to be an acceptable method of accomplishing flood risk management, consistent with existing laws, regulations and public policies?" An alternative plan is either considered acceptable or not acceptable.

Table 3-4: Effectiveness of Preliminary Alternatives in Attaining Flood Risk Management Planning Objectives

Preliminary Alternatives	Flood Risk Management Planning Objectives	
	Reduce Probability of Flooding	Reduce the Consequences of Flooding
1–Enlarge Channel/Remove Constrictions	Yes	Yes
2-Setback Levees along Creek	Yes	Yes
3-Chevron Levee to protect Newman	Yes	Yes
4-Bypass Channel	Yes	Yes
5-Upstream Flood Attenuation Basin	Yes	Yes
6-Downstream Flood Attenuation Basin	Yes	Yes
7- Chevron Levee & Channel Modifications	Yes	Yes
8 – Non-Structural	Yes	Yes

The results of the screening of preliminary flood risk management alternatives are shown in Table 3-5. Because the study team did not have actual benefit calculations for the entire preliminary array of alternatives, a more qualitative assessment and screening was done to reduce the number of alternatives carried forward to the final array. This analysis consisted of a relative comparison of the potential acreage of land required for each alternative, the amount of infrastructure or construction required, initial ranges of construction costs, resource agency concerns, and potential environmental mitigation requirements. The retained preliminary alternative plans were evaluated and compared to identify the National Economic Development (NED) plan.

The first round of the preliminary alternatives screenings focused on qualitative assessments of the benefits and effects of the proposed plans. This qualitative work was accomplished prior to the development of hydraulic and economic modeling efforts that would provide quantitative benefits, and also prior to the development of alternative specific costs. Landowners, agencies, and municipalities affected by the potential flood risk management project coordinated in this screening process. The process also applied Federal Water Resource Policy guidance as identified in ER 1105-2-100. Specifically, the PDT applied EO 11988, which seeks to preserve the beneficial uses of floodplains. The results of this screening process are captured in Table 3-6.

Table 3-5: Screening of Preliminary Flood Risk Management Alternative Plans

Preliminary Alternatives	Completeness	Effectiveness	Efficiency	Acceptability	Carried Forward?
1–Enlarge Channel/Remove Constrictions	Yes	Yes	Costly for land acquisition and structure removal	Little support for removal of structures and native vegetation	No
2-Setback Levees along Creek	Yes	Yes	Very costly for land acquisition	Agencies accepted but not locally preferred	No
3-Chevron Levee to protect Newman	Yes	Yes	Very cost effective	Agencies supportive but little local support	Yes
4-Bypass Channel	Yes	Yes	Expensive for land acquisition	Agencies supportive but little local support	No
5-Upstream Flood Attenuation Basin	Yes	Yes	Very expensive with potentially immitigable environmental effects	Local support but agencies opposed to this based on environmental and safety concerns	No
6-Downstream Flood Attenuation Basin	Yes	Yes	Very expensive – land value of mining sites very high	Some local support but agencies less opposed to this as to upstream dam	No
7 – Chevron Levee & Channel Modifications	Yes	Yes	Channel Mods not incrementally justified	Local support	Yes
8- Non-structural	Yes	Yes	Yes	Yes	Yes

Table 3-6: Summary of First Screening of Preliminary Alternative Plans

Preliminary Alternatives	Screening Summary	Carried Forward?
1–Enlarge Channel/Remove Constrictions	Technically difficult to ensure performance of this alternative due to potential channel instability. To handle large flows (median 1/100 ACE event), the channel would have to be excavated to a size about six times its current geometry. Permitting this excavation work would be difficult due to the existing remnant vegetation along the creek, which would need to be removed. Concerns with ramifications to land use changes (EO 11988).	No
2-Setback Levees along Creek	High construction cost for about 12 miles of new levees. Hydraulic mitigation would be required for conveying more water downstream. High real estate costs including land and removal of residences. At least 6 bridges would have to be replaced. Concerns with ramifications to land use changes (EO 11988).	No
3-Chevron Levee to protect Newman	Reduces flood risk in the City of Newman. Benefits exceed the costs.	Yes
4-Bypass Channel	To convey a median 1/100 ACE event, approximately eight additional bypass channels similar in size to the existing creek channel would be required. High real estate costs. New bridges would be required to cross bypass areas. Concerns with ramifications to land use changes (EO 11988).	No
5-Upstream Flood Attenuation Basin	Dam would be 1 mile long and 60 feet tall. Very high construction costs (greater than $75 million). State of California opposed to this alternative due to location immediately upstream of the California Aqueduct – a dam failure could jeopardize Southern California's water supply which is transported by the aqueduct. Concerns with ramifications to land use changes (EO 11988).	No
6-Downstream Flood Attenuation Basin	Very high construction costs (greater than $75 million) in addition to high real estate costs (site of existing gravel mining operation). Concerns with ramifications to land use changes (EO 11988).	No
7 – Chevron Levee & Channel Modifications	Combining the channel modifications with the chevron levee provides a high level of protection for the City of Newman and also reduces damages in the agricultural area. By combining these two options into a hybrid alternative, more overall benefits could be achieved.	Yes

Preliminary Alternatives	Screening Summary	Carried Forward?
8- Non-structural	The shallow flooding from Orestimba Creek can be effectively managed in part through non-structural measures. These features are cost effective and can be implemented as part of any recommended plan.	Yes

Second Screening of Study Alternatives

The chevron levee, a hybrid alternative that combined the chevron levee with other features, and the non-structural alternatives were carried forward for further consideration.

The chevron levee provided protection mainly to the urban area of Newman, thus, there was little local support for this alternative among the rural agricultural landowners. The hydraulic and economic modeling of the channel modifications showed that as a standalone option, it could not provide a high level of flood protection to Newman. However, when the channel modifications were combined with the chevron levee alternatives, the channel modifications could prevent agricultural damages that the chevron levees alternatives could not. By combining these two options into a hybrid alternative, more overall benefits could be achieved.

Various chevron levee alignments and heights were analyzed in the process of identifying the NED plan. Since the topography of the floodplain slopes from the west to the east, only a partial ring levee on the upslope side would be required, rather than a complete ring levee around the town. Flooding threatens the community of Newman only from the west and the north.

Along the west side of town, the CCID Main Canal berm captures flood flows. The berm, in effect, has already established where much of the flooding occurs in the study area. The levee alignment parallel to the CCID Main Canal retains the pattern of flooding that has been established in the rural area. The alignment along the CCID Main Canal is the only alignment which does not induce flooding in the without project condition.

The levee must extend some distance both north and south of Newman to direct flows away from the urban area and prevent flows from wrapping around behind the levee. On the southern side of town, the levee must either extend south to tie in to the Newman Wasteway berm, or the levee would need to be extended along the southern edge of town to prevent wrap-around flooding from the south. Having the levee tie in to the Newman Wasteway berm is preferred because this alignment is shorter, does not induce flooding, and causes effects to fewer existing structures.

On the north side of town, alignments along Stuhr Road and Lundy Road were analyzed. Stuhr Road marks the northern limits of the City of Newman and is a heavily traveled county road which is the most direct transportation route to Interstate 5. Stuhr Road also has

numerous utilities, an irrigation ditch and a number of residences located immediately to the north side of the road. If the levee were constructed along the north side of Stuhr Road, the levee would need to extend east for about 3 miles to reduce the chance of wrap around flooding from the north. The levee alignment would directly affect about a dozen structures located on the north side of Stuhr Road. Lundy Road is located about 1 mile north of town and has very light local traffic. Lundy Road is located near a slight topographic ridge which serves to direct floodflows into a swale which currently conveys flows in the without project condition via an existing culvert. Much like the portion of levee along the CCID Main Canal berm, the Lundy Road alignment is the alternative which most mimics the without project floodplain and therefore has the least effects in terms of induced damages and potential takings of existing structures.

Alignments in which the chevron levee continued further to the north toward Orestimba Creek were also considered but were dropped because the levee would constrict the flood flows and cause deeper flooding than in the without project condition. This northern alignment also directed floodflows to the opposite side of the creek, causing significant induced flooding.

The Lundy Road alignment was identified as the optimal location for the northern segment of the levee. It is located at a topographic high point, near an existing culvert, has the lowest potential for increases of flood depth, and has the least effects to existing infrastructure and private properties when compared to other alignments. The Lundy Road levee would also be shorter in length than either the Stuhr Road alignment or an alignment closer to the creek.

Although the channel modification (and associated hybrid plans) appeared to be incrementally justified during the preliminary screening of alternatives, more detailed cost estimates showed the increment to be significantly more costly. Because the channel modifications are an additional increment to the project after the chevron levee, the benefits for this increment come from the rural damage areas and the ability of the modified creek to better contain some of the more frequent event flows, which cause more significant flooding under existing conditions. The Hydraulics Appendix (Appendix C-2) includes floodplain maps and more detailed information about this residual flooding.

Updated floodplains and economics showed the incremental annual benefits (Table 3-7) for the channel modifications to be around $500,000. Updated (but not completed) costs for the channel modifications were estimated to be around $1.3 million in annual costs ($28 million first costs) on the lower end. These costs are on the low end because they did not yet include environmental mitigation; operations, maintenance, repair, replacement, and rehabilitation (OMRR&R); or real estate costs, which could add another $1 million in annual costs to the increment. Before these additional costs are added to the channel modifications, it has an incremental benefit-to-cost ratio of 0.39 to 1, and thus the hybrid plan was dropped from the consideration as being economically infeasible. Development of more detailed costs for this increment was not done. With the hybrid plan dropping out as economically unjustified, the only remaining plans to move forward were the Chevron Levee Alternative and the Non-structural Alternative. The measures which comprise the Non-structural Alternative have been

folded in to the Chevron Levee Alternative and are carried forward in both the NED and locally preferred plan (LPP) versions of the Chevron Levee Alternative.

Table 3-7: Incremental Annual Benefits of Remaining Alternatives

Alternative	Annual Damages	Annual Benefits	Incremental Benefits
Without Project	5,413	0	0
1. Chevron Levee	2,285	3,128	3,128
2. Chevron Levee + Channel Mods	1,800	3,613	484
3. Local Plan (Levee + Mods)	1,800	3,613	0

3.4 ANALYSIS OF FINAL ARRAY OF FLOOD RISK MANAGEMENT ALTERNATIVE PLANS

As the study progressed into more detailed design, it became apparent that the channel modifications, in the current design configuration, would not be incrementally justified. In order to reduce the risk of flooding to the City of Newman as soon as possible, the study is progressing forward with the chevron levee increment only. The channel modification increment could be the focus of a later study focusing on improving the environmental quality of the creek or could be an initiative proposed by another agency or local group.

Table 3-8 below shows the economic optimization of the chevron levee height along the CCID Main Canal near Lundy Road. The levee elevation heights correspond to the median ACE flood event water surface elevations in the left column. This table shows that there is very little variation in the water surface elevations for the various events. This is due to the fact that flood waters on an alluvial fan spread out over a large area. The levee height optimized at an elevation of 112.8 feet NAVD88, as highlighted in the table below. This is identified as the NED levee.

Table 3-8: Optimization of the Chevron Levee Height (at unnamed farm road and the CCID Canal)

Median Annual Exceedance Probability	**Levee Elevation (feet-NAVD88)**	**Annual Benefits (1,000's)**	**Annual Costs ($1,000's)**	**Net Benefits ($1,000's)**
1/50	111.12	2,172	1568	604
	111.25	2,281	1629	652
	111.5	2,505	1690	815
	111.75	2,705	1751	954
1/500	112	2,878	1812	1,066
	112.25	3,003	1862	1,141
	112.5	3,083	1907	1,176
NED	112.75[1]	3,128	1942	1,186
	113	3,128	2003	1,125
	113.25	3,128	2064	1,064
	113.5	3,128	2125	1,003
	113.75	3,128	2186	942
	114	3,128	2247	881
	114.25	3,128	2308	820
1/200 +3ft	114.8	3,128	2372	756

Notes:
[1] The height of the optimized NED levee height has been rounded to 112.8 FT-NAVD88
[2] Costs and benefits have been interpolated between known points.

The chevron levee height was optimized by inserting incrementally higher levees into the Economic model (HEC-FDA) and comparing the increased benefits to the estimated incremental costs. Costs were estimated by Cost Engineering for a levee equal to the 50-year mean water surface elevation (WSEL) and the 200-year mean WSEL with 3 feet of freeboard. These two values were then used to create a linear interpolation between the two points in order to estimate the cost of incrementally higher levees. This analysis is solely used for optimization of the levee height in order for costs and residual benefits to be determined in more detail on only one plan. As shown in Table 3-8 above, the optimal elevation for the top of levee at this location near Stuhr Road is determined to be around 112.75 feet NAVD88, which equates to a levee 5.5 to 8 feet tall depending on the ground elevation changes along the levee alignment. It is noted here that this height is higher than the mean 1/500-year WSEL, but because of the alluvial fan type of flooding, the mean 1/500-year WSEL is only 9 inches higher than the 1/50-year mean WSEL.

3.4.1 The No Action Plan (Final Alternative 1)

The No Action Plan would essentially be the same as the without project condition described in Section 2.3. The City of Newman and the surrounding agricultural area would remain at risk of flooding.

3.4.2 The Tentative NED Plan (Final Alternative 2 – Levee Elevation at 112.8 feet NAVD88)

The NED plan consists of the construction of a chevron levee along the city of Newman's northwestern perimeter (Figure 3-11). The chevron levee maximizes benefits to the urban area by reducing flood damages associated with Orestimba Creek overflows. The north side of the chevron levee would be constructed along approximately 1 mile of an unnamed farm road about 1 mile north of town. The elevation of the northern segment of levee would increase from where it ties in to the railroad berm to the point at which it meets the CCID Main Canal berm. The western segment would be constructed parallel to the eastern bank of the CCID Main Canal from the farm road south to the Newman Wasteway, a distance of about approximately 4 miles. The design includes four road/railroad stoplog closure structures. The height of the chevron levee would equate to about elevation 112.8 feet NAVD88, which means the levee would be about 5 to 8 feet high, depending on the ground elevation changes along the levee alignment. This levee elevation captured the most benefits for the least amount of costs and was therefore identified as the elevation that would be included in the NED plan.

Various chevron levee alignments and heights were analyzed in the process of identifying the NED plan. Alignments in which the Chevron Levee construction continued further to the north were also considered, but were dropped because of the deeper floodplains which resulted. This northern alignment also directed floodflows to the opposite side of the creek, causing significant induced flooding. A levee alignment along Stuhr Road was also evaluated. The benefit of locating the levee at the farm road location rather than the Stuhr Road location is the reduction in overall cost that would come from less material being required, fewer utilities to contend with, and less traffic to re-route during construction. Less fill material would be required to construct the levee because the top width of this levee only needs to be 16 feet wide, whereas the Stuhr Road levee would need to be 35 feet wide to replace the existing width of the county road. The farm road segment of the levee was refined to a diagonal alignment in order to tie in to the CNRR embankment near an existing culvert to reduce the frequency and duration of floodwater ponding on the north side of the levee.

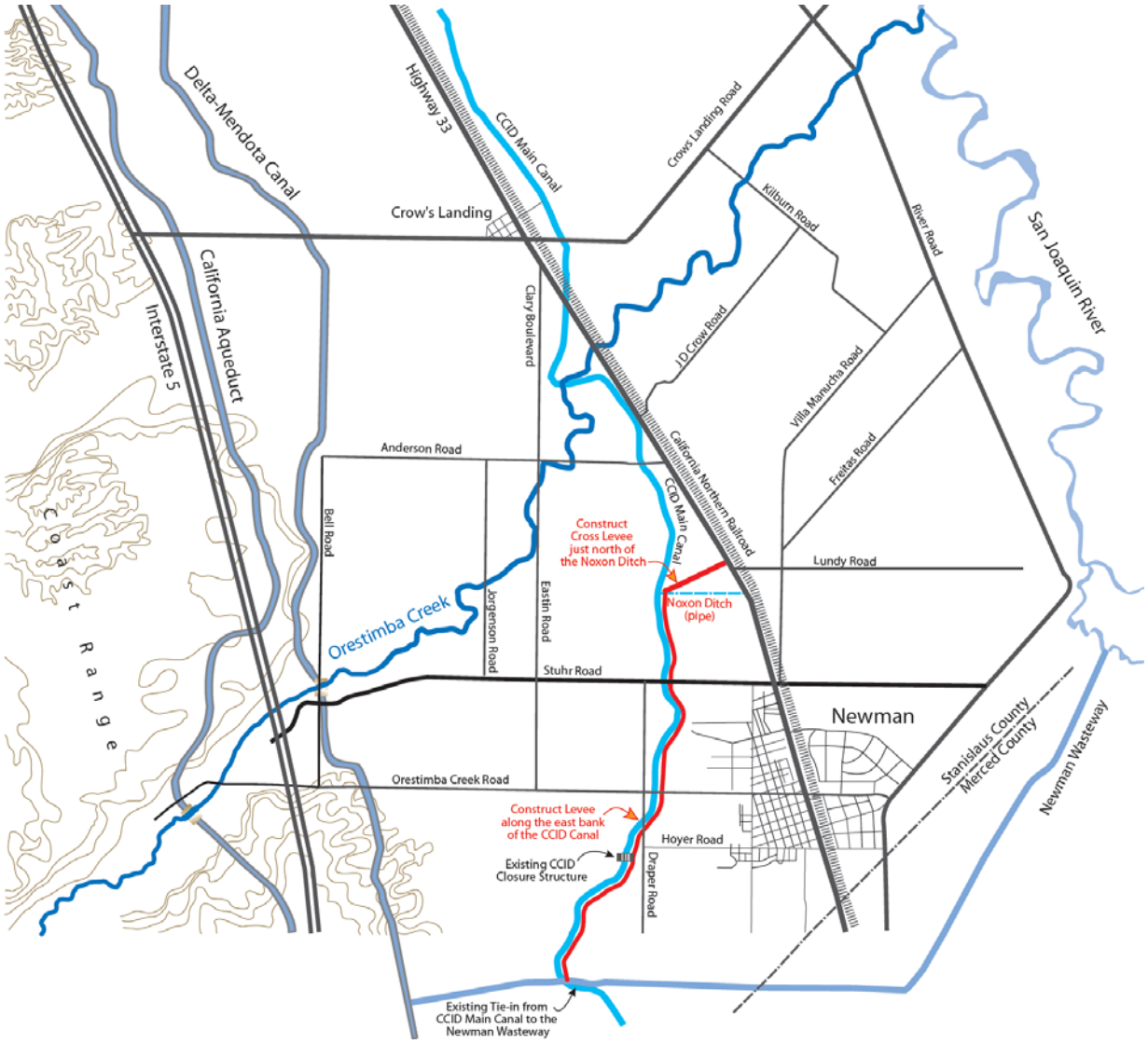


Figure 3-11: The Tentative NED Plan

Based on the results of hydraulic modeling, the area north and east of the levee tie-in with the railroad might experience increased depths in some locations with implementation of the project. The depth of the potential increases during peak flows, which are projected to recede within 24 hours, would vary under each flood event scenario based on the existing topography. The range of depths under each frequency scenario is generally similar under both existing and with project conditions. The main difference would likely be during the 1/10 ACE, in which depths in some places could increase by up to six inches.

Agriculture (row crops) is the primary land use within the area that could experience increased flood depths. Four residences are also located within this area. The potential increased depth

that could occur during the 1/10 ACE at each residence ranges from 3 to 6 inches. A windshield survey determined that each residence is on a raised foundation with several steps required to reach the first floor elevation. In addition, the structures are located on raised building sites, putting the first floor elevation well above the modeled potential depths. The potential for increased depths in areas already flooded under existing conditions was analyzed by USACE real estate specialists and determined not to constitute a taking.

Increased depths of flooding for the 10% (1/10) to 5% (1/20) annual chance exceedance event range from 0 to 0.5 foot on top of an existing flooding between 0.1 to 1.3 feet. For flooding events less frequent than the 5% (1/20) annual chance exceedance event, induced flooding is less than 0.1 foot on average. The current aerial extent affects four residential structures, but it's important to note that alluvial fan flooding extent is uncertain and small changes to topography could impact these flooding boundaries. In general, structures within the vicinity of potential induced flooding are rural homes with an elevated first floor height of at least 1.5 feet. Non-structural mitigation measures were considered for these homes, such as flood proofing or raising at a cost of $15,000 to $50,000 per home ($697 to $2,325 annual cost). Because flooding is shallow and the homes already have a foundation height of 1.5 feet, induced damages are expected to be negligible. Taking into account the ranges listed above, even the worst case of induced flooding ($400,000 structure/contents with no elevated foundation height, zero existing flooding and 0.5 foot of induced flooding for the 10% (1/10) - 5% (1/20) annual chance events, induced annual damages would be around $600/home. Taking this extreme case, and comparing to the cost range, results in a benefit-cost ratio between 0.26 and 0.86. For the most likely scenario ($300,000 structure/contents, with 1.5-foot foundation height, 0.5 foot of existing flooding and about 0.2 foot of induced flooding), the induced annual damage is $170 with a benefit-cost ratio range from 0.07 to 0.24.

Implementation of the project would involve require the levee cross the CNRR embankment to prevent floodwaters from being conveyed south towards Newman. As a result, flood flows may overtop the railroad during more frequent events than under existing conditions. Based on recommendations in the Final Geotechnical Evaluation (Appendix C.5), the tie-in has been designed to mitigate through-seepage and provide erosion protection for the railroad embankment.

In addition to the structural features, the NED plan also includes several non-structural features to further reduce the consequences of flooding. These include an advanced warning system based on stream gages at the several points where the creek historically has overflowed its banks. This flood warning system would be combined with an emergency evacuation plan. A reverse 911 system would alert surrounding residents of the flood threat, especially if the flood peak occurs during the night, as happened in 1995. Public educational materials would be distributed annually as part of the Orestimba Creek Flood Control District's assessment mailing. The materials would describe the residual risk of flooding through the inclusion of a floodplain map and description of the nature and type of flooding. The material would also describe the

risks of traversing flooded roadways. Informational signs would be placed along roads which alert drivers to the possibility of flooding in the area.

3.4.3 The Locally Preferred Plan (Final Alternative 3 - Levee Elevation at 114.8 FT NAVD88)

The LPP includes the same elements as the NED plan (including overall length and number of closure structures), but raises the height of the chevron levee to include 3 feet of freeboard above the median 1/200 ACE water surface elevation. This freeboard was requested by the local sponsor in order to meet State of California requirements for an urban area, which is identified as the 1/200 year median Water Surface Elevation (WSEL) plus 3 feet of freeboard. The LPP levee would be 6 to 7 feet tall or about 2 feet taller than the NED levee.

Pursuant to 44 CFR, Part 65.10, FEMA requires a levee to be either: a) 3 feet above the median 1% WSEL with a 90% assurance for the 1% event or b) 2 feet above the median 1% WSEL with 95 % assurance for the 1% event. The NED levee is about 1.5 feet shorter than these criteria; however, the LPP achieves it. The State of California requires urban and urbanizing areas (with a population of 10,000 or greater) to achieve 1/200 ACE level of protection in order to qualify for State funding of flood management projects. The State's interim levee design guidelines require 3 feet of freeboard above the median 1/200 ACE water surface elevation or higher if required for wind setup and wave run up (Senate Bill [SB] 5, Government Code, Sections 65865.5, 65962, 66474.5). It was determined that additional freeboard to account for wind waves would not be required to meet the criteria. The State's interim urban levee design guidelines also allow for a reduction of freeboard to 2 feet above the median 1/200 ACE water surface elevation if 95% assurance can be provided. The LPP levee height may be reduced during PED if it is determined through more rigorous uncertainty analysis that it will meet FEMA's and the State of California's 95% assurance criteria. The State's "Urban Levee Design Criteria", contained in the "Draft Urban Level of Flood Protection Criteria" (2012), also specifies that civil engineers would be allowed and encouraged to adjust the Design WSEL upward to account for climate change. Additional freeboard was not specified for climate change in the LPP. The median 1/200 ACE water surface profile was found to be relatively insensitive to increased flood discharge.

The difference between the median 1/100 ACE and median 1/200 ACE water surface elevation was found to be less than 0.4 feet along the proposed levee. As discussed for the Tentative NED, construction of the chevron levee would alter the nature of the existing floodplain by increasing the depth of flooding to the north the area north and east of the proposed levee tie-in with the railroad. The potential for increased depths in areas already flooded under existing conditions was analyzed by USACE real estate specialists and determined not to constitute a taking. The tie-in has been designed to mitigate through-seepage and provide erosion protection for the CNRR bed.

In addition to the structural features, the tentatively recommended plan also includes several non-structural features to further reduce the consequences of flooding. These include an advanced warning system based on stream gages at the several points where the creek historically has overflowed its banks. This flood warning system would be combined with an emergency evacuation plan. A reverse 911 system would alert surrounding residents of the flood threat, especially if the flood peak occurs during the night, as happened in 1995. Public educational materials would be distributed annually as part of the Orestimba Creek Flood Control District's assessment mailing. The materials would describe the residual risk of flooding through the inclusion of a floodplain map and description of the nature and type of flooding. The material would also describe the risks of traversing flooded roadways. Informational signs would be placed along roads which alert drivers to the possibility of flooding in the area.

Table 3-9 below shows the economic benefits, costs, and net benefits of the final alternatives. There is basically no quantifiable difference between the benefits attributed to Final Alternative 2 and Final Alternative 3; however final Alternative 3 would allow the sponsor to meet State of California requirements as well as FEMA accreditation requirements. Investment costs, annual costs, and annual benefits for the NED and LPP plans are displayed in Table 3-10 below.

Table 3-9: Orestimba Creek Economic Summary

Alternative	Annual Benefits	Annual Costs	Net Benefits	B/C Ratio
Final Alternative 1 – No Action	0	0	0	0
Final Alternative 2 – Chevron Levee at elevation 112.8	3,128	1,942	1,187	1.61
Final Alternative 3 – Chevron Levee at elevation 114.8	3,128	2,372	756	1.34

Table 3-10: Comparison of Total Annual Benefits and Costs for the NED and LPP[1,2]

Item	NED Plan	LPP Plan
Investment Costs:		
Flood Risk Management First Costs	35,200,000	44,000,000
Less Cultural Resource Preservation[3]	-300,000	-350,000
Interest During Construction	2,100,000	2,700,000
Total	**37,000,000**	**46,350,000**
Annual Cost		
Interest and Amortization	1,726,000	2,159,000
OMRR&R	164,000	180,000
Total	**1,890,000**	**2,339,000**
Annual Benefits	3,128,000	3,128,000
Net Annual Flood Risk Management Benefits	1,238,000	789,000
Benefit to Cost Ratio	1.66	1.34

Notes:
[1] Based on October 2011 price levels, 4 percent rate of interest, and a 50-year period of analysis.
[2] some numbers have been rounded and may be slightly different than those displayed in the appendices.
[3] Cultural Resource costs are a contingency cost based on .4% of project first costs and are not cost shared.

Table 3-11 (Project Performance) shows that both the NED and LPP provide over 99% Assurance (described in the table as conditional non-exceedence probability) of passing the 1% ACE event. The FEMA requirement for accreditation within the NFIP is 95%. Both the NED and the LPP show very little probability of flooding in any given year with an Annual Exceedence Probability of less than 0.04% (1/2,500). Additional information on project performance is located in the Economic Appendix (Appendix E).

Table 3-11: Project Performance – Urban Economic Impact Area

Alternative	Annual Exceedence Probability		Long-Term Risk			Assurance (Conditional Non-Exceedence Probability)			
	Median	Expected	10 year Period	30 year Period	50 year Period	10%	2%	1%	0.20%
No Action	14.43%	15.13%	81%	98%	99%	13%	0%	0%	0%
NED Plan (Chevron Levee at 112.8 feet)	0.01%	0.04%	0%	1%	2%	99%	99%	99%	98%
LPP Plan (Chevron Levee at 114.8 feet)	0.00%	0.00%	0%	0%	0%	99%	99%	99%	99%

Executive Order (EO) 11988

The objective of the study is to reduce flood risk within the study area. EO 11988 has an objective of "avoidance, to the extent possible, of long- and short-term adverse impacts associated with the occupancy and modification of the base flood plain and the avoidance of direct and indirect support of development in the base flood plain wherever there is a practicable alternative". The study is responsive to the EO 11988 objective because the proposed features focus on reducing the threat of flooding to the existing urban area, altering a very small area within the floodplain. These features would reduce the hazard and risk associated with floods thereby minimizing the effects of floods on life safety, health, and welfare, and would preserve the natural and beneficial values of the base floodplain. For these reasons the proposed plan is in compliance with EO 11988.

The proposed project has been optimized to reduce the risk of flooding to the community while removing the minimal amount of land from the floodplain which would preserve the natural and beneficial uses of the vast majority of the remainder of the floodplain. However, since floodplain depths in the study area are shallow, any new construction currently could be elevated above the FEMA base floodplain for a reasonable cost. The team calculated the acres of potentially developable land. The primary assumption is that future development within the floodplain would be limited to areas where a structure's first floor elevation could be economically constructed above the FEMA base floodplain (1% ACE flood depths). The PDT assumed that 3 feet is a reasonable economic limit to raise the 1st floor elevation. Of the remaining un-developed parcels in the study area, all areas that have 100-year flood depths less than 3 feet were identified. These areas were assumed to be potentially developable. The summary of potentially developable land is:

- Without Project = 39,834 acres
- With Chevron Levee Alternative = 39,826.

The results indicate that the 1% ACE flood depth is an insignificant factor in the potential development within the floodplain. This is due to the relatively shallow flood depths. The computation indicates a net eight-acre reduction in potentially developable land. This is probably related to slight increases in temporary flood depths on existing agricultural lands outside the chevron levee.

3.5 SYSTEM OF ACCOUNTS ANALYSIS AND COMPARISON

The system of accounts is a set of categories which provide a comprehensive framework to demonstrate both the positive and negative effects of each plan. The intent is to provide decision makers with plan rankings based on advantages and disadvantages of each alternative. In addition, the accounts provide a visual display and assessment of the effects as required by NEPA.

National Economic Development (NED)

The NED account includes the estimates of project benefits and costs used to calculate net economic benefits. A full display of the analysis for the NED account is located in the Economic Appendix. This analysis establishes the economic feasibility of each plan and is used to identify Federal interest. The NED analysis dates back to the Flood Control Act of 1936 in which Congress determined that the Federal Government should participate in flood management and determine the benefits and costs of those activities. The analysis has been documented and refined over the years in various publications, including the Principles and Standards for Planning Water and Related Land Resources (P&S) and the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G). It was in the P&G that the following additional accounts were identified.

Environmental Quality (EQ)

The EQ account displays the effects on the ecological, cultural, aesthetic, and other attributes of natural and cultural resources. The environmental effects of the various alternatives are classified as direct and indirect. Direct effects result immediately from constructing and operating the project. Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems. Additional information on the EQ analysis is captured in Chapters 4 and 5 of this report.

Regional Economic Development (RED)

The RED analysis measures changes in the distribution of regional economic activity that result from alternative plans. Changes in economic activity and employment that occur locally or regionally when a project is implemented are excluded from the NED Account to the extent that they are offset through transfers of this economic activity and employment to other regions of the Nation. The effects on the regional economy, including income effects, income transfers, and employment effects not addressed in the NED account are evaluated in the RED. Two measures of the effects of the plan on regional economies are used in the account:

regional income and regional employment. Additional information on the RED analysis performed for this study can be found in Attachment C of the Economic Appendix.

National Flood Insurance Program: The LPP would provide RED benefits related to a reduction in NFIP Premiums. The NFIP requires flood insurance for those residential properties with Federally-backed mortgages that are deemed as being within FEMA's regulatory 1% Annual Chance Exceedence event floodplain. Those outside the regulatory floodplain are eligible to purchase flood insurance at the preferred rate, which is significantly less than the standard rate charged to those within the regulatory floodplain area. Discussion with a local insurance representative in Newman indicates that the preferred rate for single family housing, outside the regulatory 1% Annual Chance Exceedence floodplain is $250 annually for insurance for both structure and contents; while structures without adequate certification required annual insurance premium of $900 to $950. The savings of approximately $700 annually is recognized as significant to those residents located in Newman.

Current evaluation of the Newman floodplains shows 1,062 residential structures in the 1% (1/100) ACE floodplain. Theoretically, these 1,062 structures could be in the standard rate area if FEMA was re-mapped. Accordingly, an annual savings of $743,000 ($700 x 1,062) could be attributed to the LPP as a direct result of accommodating the FEMA flood requirements. There are currently approximately 700 residents paying the standard rate, but FEMA is currently re-mapping floodplains.

Other Social Effects (OSE)

OSE relates to the quality of life, health, and safety in the community. Destruction or disruption of the built environment, esthetic values, community cohesion, and availability of public facilities and services has also been analyzed. These include displacement effects to people and businesses, the general population (including minorities and special interest groups), and public health and safety. Assessments of beneficial and adverse effects are based on comparisons of the with project alternative to the without project alternative conditions expected to prevail in the future in the absence of the project. The social effects of the alternatives have both direct effects and indirect effects. Direct effects result immediately from constructing the project. Indirect effects result from the effects of the project on existing patterns, including ecosystem patterns, in the study area. Additional information on the OSE analysis performed for this study can be found in Attachment D of the Economic Appendix.

Table 3-12: Summary System of Accounts Comparison of Final Array of Alternative Plans

	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 NED PLAN	ALTERNATIVE 3 LOCALLY PREFERRED PLAN
1. PLAN DESCRIPTION			
	The No Action provides no physical project constructed by the Federal Government or local interests.	The NED plan is the chevron levee with a top of levee elevation constructed to about 112.8' (NAVD88)	The LPP plan is the chevron levee with a top of levee elevation constructed to about 114.8' (NAVD88)
2. IMPACT ASSESSEMENT			
A. National Economic Development (NED)			
1. Project Cost	$0	$37,000,000	46,350,000
2. Annual Cost	$0	$1,890,000	2,339,000
3. Total Annual Benefit	$0	$3,128,000	$3,128,000
4. Annual Net Benefits	$0	$1,238,000	$789,000
5. Benefit - Cost Ratio	N/A	1.66	1.34
B. Environmental Quality (EQ)			
1. Air/Noise	No construction activities present; Normal noise levels created by traffic, business, and industrial activities.	Temporary increase of criteria pollutants and noise levels during estimated 2 year construction period.	Temporary increased noise levels during estimated 2 year construction period.
2. Water Quality	Significant impacts possible due to chemical storage area flooding.	Reduction chemical storage areas exposure to flooding.	Same as NED.
3. Environmental habitat connectivity	Existing vegetation and habitat typical for agricultural area in the San Joaquin River Basin.	Temporary loss of connectivity due to construction activities.	Same as described for NED.
4. Threatened & Endangered Species	No increased impacts sensitive species.	Temporary disturbance caused by construction. Surveys and monitoring for mitigation.	Same as described for NED
5. Cumulative Effects	No increased effects	Initial construction to effect project area.	Same as described for NED.
6. Cultural Resources & Historic Properties	No increased impacts.	Full coordination and monitoring during construction. Mitigated.	Full coordination and monitoring during construction. Mitigated.

C. Regional Economic Development (RED)			
1. Construction Activities	Future flooding would destroy part of infrastructure resulting in a loss in the region's ability to produce goods and services. Little to no RED benefits	Value added: .325 temporary jobs added within the region and 530 jobs added within the State. The gross regional product for the State is about $34 million while the nationwide amount is about $47 million.	Slightly higher Value added: .382 temporary jobs added within the region and 584 jobs added within the State. The gross regional product for the State is about $34 million while the nationwide amount is about $47 million.
2. Future Residential Development	Parts of the City of Newman lie outside of the FEMA regulatory floodplain and therefore have no development restrictions. New development must be built above the 1% flood elevation, which is economical to accomplish.	Future development associated with the construction of new homes would generate substantial economic activity in the study area. Levee construction would decrease the risk of flooding to the established downtown and older residential areas.	Future development associated with the construction of new homes would generate substantial economic activity in the study area. Levee construction would decrease the risk of flooding to the established downtown and older residential areas.
3. General Economic Gains	Emergency response and recovery activities and reconstructions and repairs. The economic stimulus generated would only be temporary and minor compared to overall losses.	The with project regional economic impacts would emerge from more gradual spending over an extended timeframe. Levee construction is expected to take place over a 2-year period.	The with project regional economic impacts would emerge from more gradual spending over an extended timeframe Levee construction is expected to take place over a 2-year period.
D. Other Social Effects (OSE)			
1. Life, Health, and Safety	Continued flood risk in the City of Newman.	Mitigated by Flood Warning Emergency Evacuation Plan.	Mitigated by Flood Warning Emergency Evacuation Plan.
2. Community Cohesion (displacement of people & businesses)	Future flooding would displace selected businesses and subject the community to potential catastrophic flood risk.	Increased level of protection to homes and businesses within the City of Newman but still within the FEMA regulatory floodplain.	200-year level of protection to homes and businesses within the City of Newman. The City is removed from the FEMA regulatory floodplain.
3. Residual Risk	Residual risk remains high throughout the study area	Residual risk reduced in the City of Newman	Residual risk reduced in the City of Newman.

3.6 The Tentatively Recommended Plan

The tentatively recommended plan is the LPP. Selection of this plan over the NED plan is justified due to overriding reasons based on State and local concerns. This plan allows the local community to meet both FEMA accreditation requirements and the State of California's criteria for funding of flood management projects. This plan meets the study objectives of reducing flood risk and flood damages.

In addition to the structural features, the tentatively recommended plan also includes several non-structural features to further reduce the consequences of flooding. These include an advanced warning system based on stream gages at the several points where the creek historically has overflowed its banks. This flood warning system would be combined with an emergency evacuation plan. A reverse 911 system would alert surrounding residents of the flood threat, especially if the flood peak occurs during the night, as happened in 1995. Public educational materials would be distributed annually as part of the Orestimba Creek Flood Control District's assessment mailing. The materials would describe the residual risk of flooding through the inclusion of a floodplain map and description of the nature and type of flooding. The material would also describe the risks of traversing flooded roadways. Informational signs would be placed along roads which alert drivers to the possibility of flooding in the area.

CHAPTER 4.0 - AFFECTED ENVIRONMENT*

4.1 INTRODUCTION

This chapter describes the existing environmental conditions within the range of potential effects occurring as a result of any alternative potentially being implemented, including the no action alternative. The assessment of baseline conditions for each resource provides a framework for comparison of the quantity and quality of potential impacts resulting from each project alternative. Existing conditions are described for each resource within a geographic boundary limited by the range of potential impacts on that resource. The study area of each affected resource can thus be limited to geologically defined boundaries such as the Orestimba Creek watershed, sociologically defined boundaries such as Stanislaus County, or some other boundary relative to the resource or subject being evaluated. Due to the scope of the project and its potential effects on the human and biological environment, each resource has been evaluated in detail. As noted in the previous chapter, the channel modifications portion of the project is no longer incrementally justified as currently designed. Since this increment was still under consideration when environmental effects were assessed, it is identified in the graphics prepared for this section. The discussion of impacts associated with the section was extracted and placed in Appendix B for reference, should work modifications to the channel be proposed in the future.

4.2 EXISTING CONDITIONS

4.2.1 Seismicity

Two active fault zones, Green Valley and Ortigalita, and one fault line, the San Joaquin, are associated with the Diablo Range and occur in Stanislaus County (U.S. Geological Survey [USGS] and California Geologic Survey, 2006). The San Joaquin fault is the eastern most of these faults and parrellels the Diablo Range near I-5 from Tracy to Newman, California (Figure 4-1). The Ortigalita fault zone is associated with an Alquist-Priolo Earthquake Fault Zone (California Geologic Survey, 2010). Since 1979, one earthquake has been recorded in the vicinity of the study area (USGS, 2008a). This 3.5 magnitude event occurred on February 25, 2007, approximately 2 miles west-southwest of Newman. Seismicity in the Orestimba Creek watershed is of low risk compared to other areas in the San Joaquin Valley. Although not currently a significant problem, seismic activity in the range results from the compression stress created by the collision of the Pacific and North American plates. This stress does create a high potential for landslides, particularly in the headwaters within the Diablo Range.

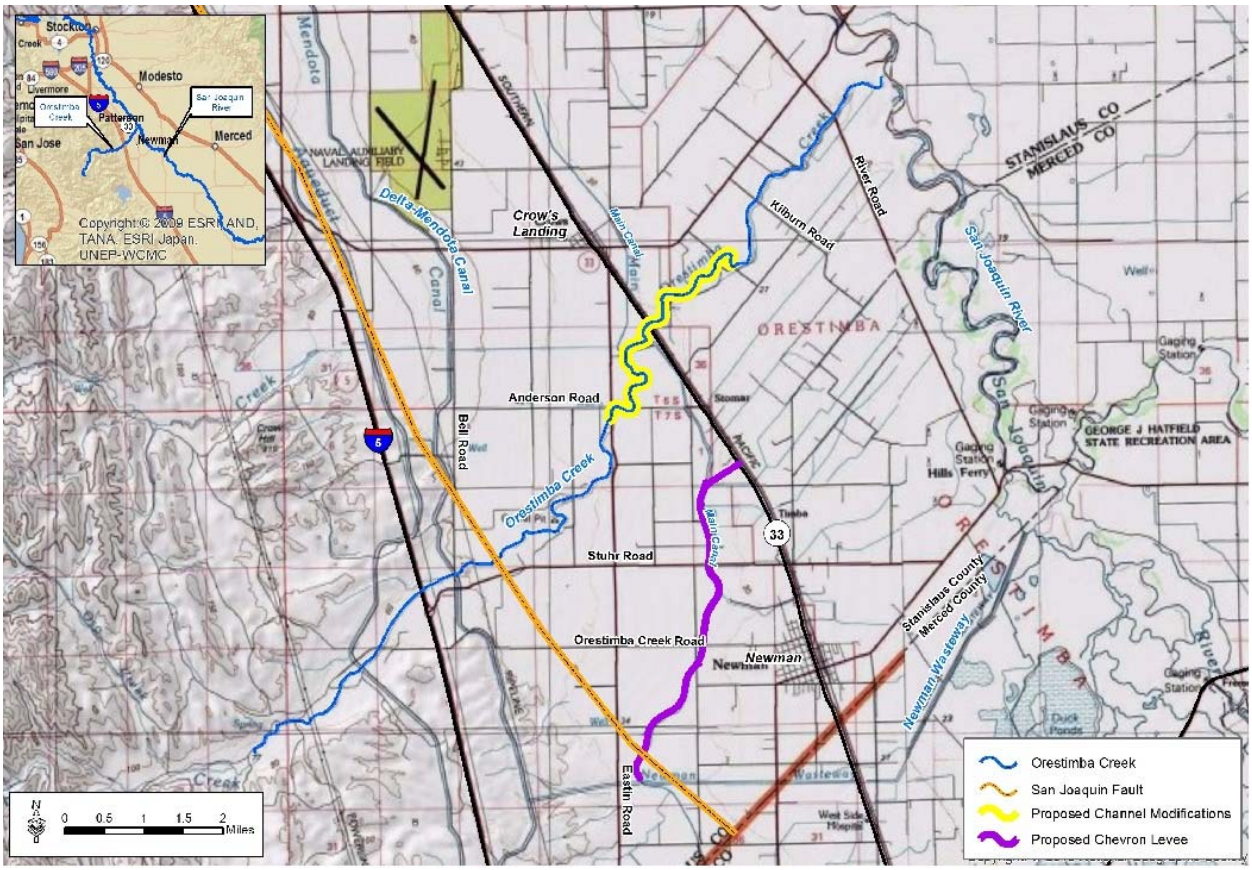


Figure 4-1: Seismic Hazards near the Study Area

4.2.2 Geology

Orestimba Creek drains the Diablo Range and flows west to the San Joaquin Valley. The Diablo Range is part of the Orestimba Block, one of the structural blocks of the California Coast Range (California Division of Mines and Geology, 1966; Wentworth et al., 1999). The California Coast Range consists primarily of deeply incised sedimentary and metamorphic materials of highly varied ages. The basement of the Diablo Range is made up of accreted Franciscan Complex, which is overlain by Coast Range ophiolites and marine clastics from the Mesozoic Great Valley Sequence. Both ranges are north-south trending features, uplifted as a result of tectonic forces. The high rate of uplift has resulted in a land surface that is over-steepened and highly eroded. Cone-shaped colluvial, or "slope wash" deposits lie at the foot of most slopes. The complex tectonic history of the region has created an exceedingly complex geologic setting, with numerous rock types in evidence within the watershed, including shale, serpentine, sandstone, conglomerates, graywacke, chert, and small amounts of limestone.

Orestimba Creek flows in an east-northeasterly direction through the Diablo Range before emerging at the foothills and entering the San Joaquin Valley (California Division of Mines and Geology, 1966). The San Joaquin Valley, approximately 450 miles from north to

south, is a massive elongated north-south trending basin extending all the way from the Sacramento-San Joaquin Delta to southern California. The San Joaquin Valley is dominated by interfingered alluvial fans resulting from erosion and subsequent downstream deposition of materials from the California Coast Range in the west and the Sierra Nevada to the east. The alluvial fans consist of very recent Quaternary materials at the surface, blended in places with older material redeposited from repeated erosion of areas further upstream in the watershed, underlain by sediments of Jurassic age at the foot of the basin.

From the foothills of the Diablo Range, Orestimba Creek flows northeasterly over its historic alluvial fan toward its confluence with the San Joaquin River. The historic alluvial fan surface is composed primarily of upper Holocene Patterson Alluvium and upper Pleistocene to Holocene San Luis Ranch Alluvium. Due to modification of Orestimba Creek's natural hydrology, material carried downstream from the Diablo Range is not typically deposited onto the alluvial surface, but is carried to the San Joaquin River. Some deposition likely occurs adjacent to the middle reach during high flow events, when the capacity of the creek is exceeded.

4.2.3 Soils and Prime Farmlands

Soils in the Orestimba Creek watershed (Figure 4-2) have been deposited as a result of erosion of the many rock types found in the watershed. According to an NRCS soil survey of west Stanislaus County, six general soil map units occur within the 100-year floodplain of Orestimba Creek (NRCS, 2002). General soil map units describe a unique natural landscape and are generally comprised of a soil complex of two or more soil series. A soil series describes soils that have nearly identical profiles and other physical properties.

Soils range from highly sandy to dominantly fine, with fine to extremely coarse gradations. Erosion and expansion potentials are moderate to high for the soil series in the study area. Erosion is not generally a concern in the area due to the relatively level terrain; however, wind can erode exposed and recently disturbed soils. Expansive soils contain a higher content of clay and expand and shrink depending on water content. Subsidence can occur locally as a result of seasonal changes in soil moisture content. Substantial groundwater-related subsidence has occurred throughout the San Joaquin Valley as drainage of lowlands has resulted in the decomposition of organic components in the soils. Avoiding subsidence can be achieved through irrigation management.

In general, soils are highly suitable for agriculture due to their drainage characteristics. Most of the soils in the study area, where irrigated, are considered prime farmland or farmland of statewide importance (NRCS, 2002). Some soils require protection from flooding, or must not be frequently flooded during the growing season, to be considered prime farmland. Flooding is considered frequent if it occurs on average more than once every 2 years (1/2 Annual Chance Exceedence [ACE]). Within Newman's sphere of influence (SOI) (see section 4.2.14 below), there are 1,729 acres of Prime Farmland, 710 acres of Unique Farmland, and 196 acres of Farmland of Local Importance. With implementation of Newman's General Plan, most

or all of these lands would be developed for urban uses in the future. The proposed footprint of the chevron levee is also within Newman's SOI and includes approximately 152 acres of soils classified as prime farmlands.

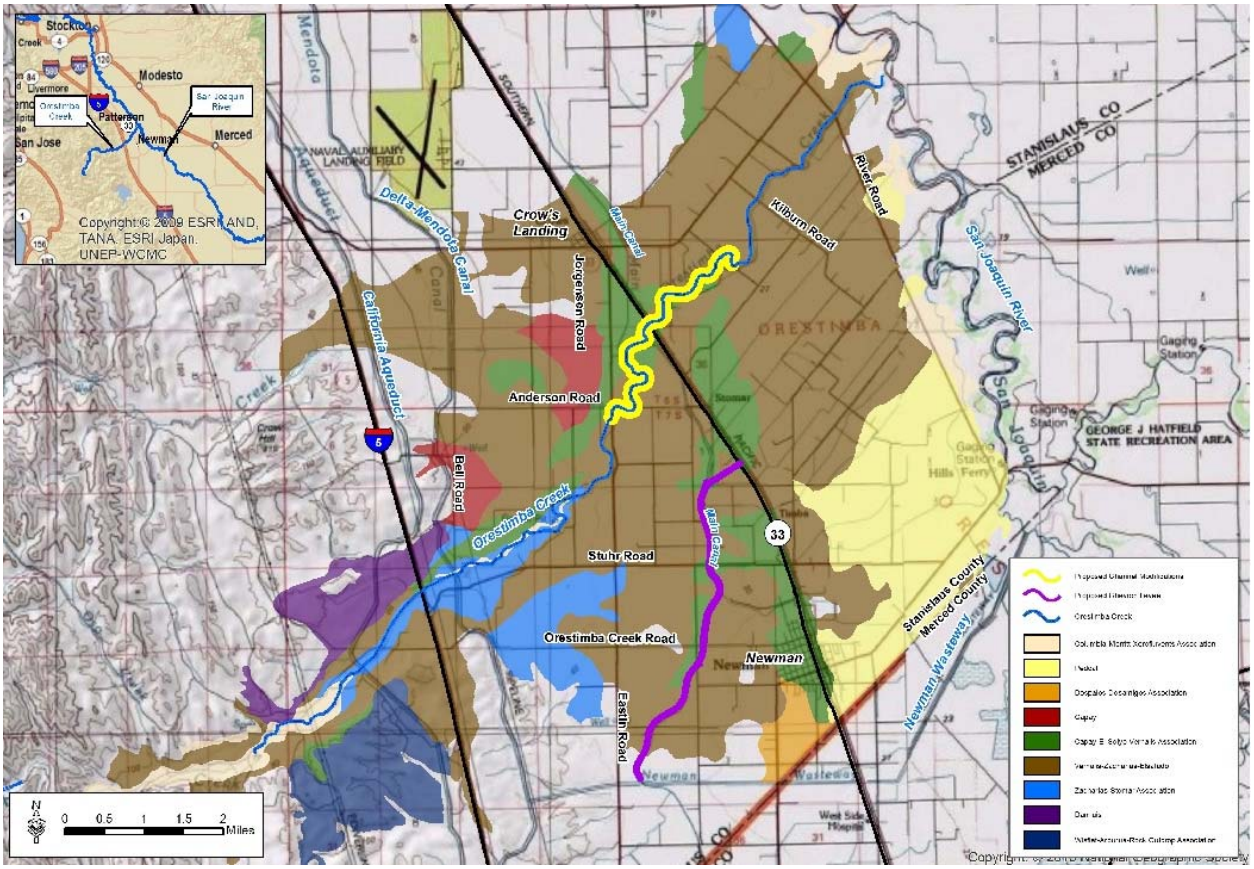


Figure 4-2: Soils within the Alluvial Fan of Orestimba Creek

4.2.4 Hydrology

Flow Gauges

There are two continuous record stream gauges in the Orestimba Creek watershed (USGS 2008a). Both gauges are located on the mainstem of Orestimba Creek: one 20 feet downstream of the California Aqueduct (USGS Gauge Orestimba Creek at Newman) and the other a short distance upstream of the San Joaquin River (USGS Gauge Orestimba Creek at River Road near Crows Landing). The Orestimba Creek at Newman Gauge has been in operation since 1932 and recorded a peak flow record of 12,000 cubic feet per second (cfs) on March 10, 1995 (Figure 4-3). Over the 75 year period of record, peak flows have exceeded 4,000 cfs 17 times, and peak flows have been less than 1,000 cfs 34 times, including 11 years of no flow. Downstream, the Orestimba Creek at River Road Gauge has only been in operation since 1992. Peak flows at this gauge, for the period of record, have been less than 3,000 cfs including the

1995 flood year. Peak flows in this reach have been less than 1,000 cfs for half of the recorded years and were nearly 0 in 1992, 1994, 2007, and 2009 (Figure 4-4).

Overbank flooding does occur as a result of small, intense flash flood events resulting from summer thunderstorms and longer duration storms typical of winter and spring. The majority of rainfall occurs in the upper watershed with less rainfall over the alluvial fan. As cool, moist air masses descend into the valley, increasing air pressure warms the air and increases its ability to hold moisture. Winter and spring storms are often of low to moderate intensity and may cover the entire drainage basin. Summer thunderstorms are often shorter in duration and isolated to a particular portion of the basin. While flash floods are capable of producing significant amounts of runoff over a short time period, it is the more sustained storms that produce peak runoff rates and volumes.

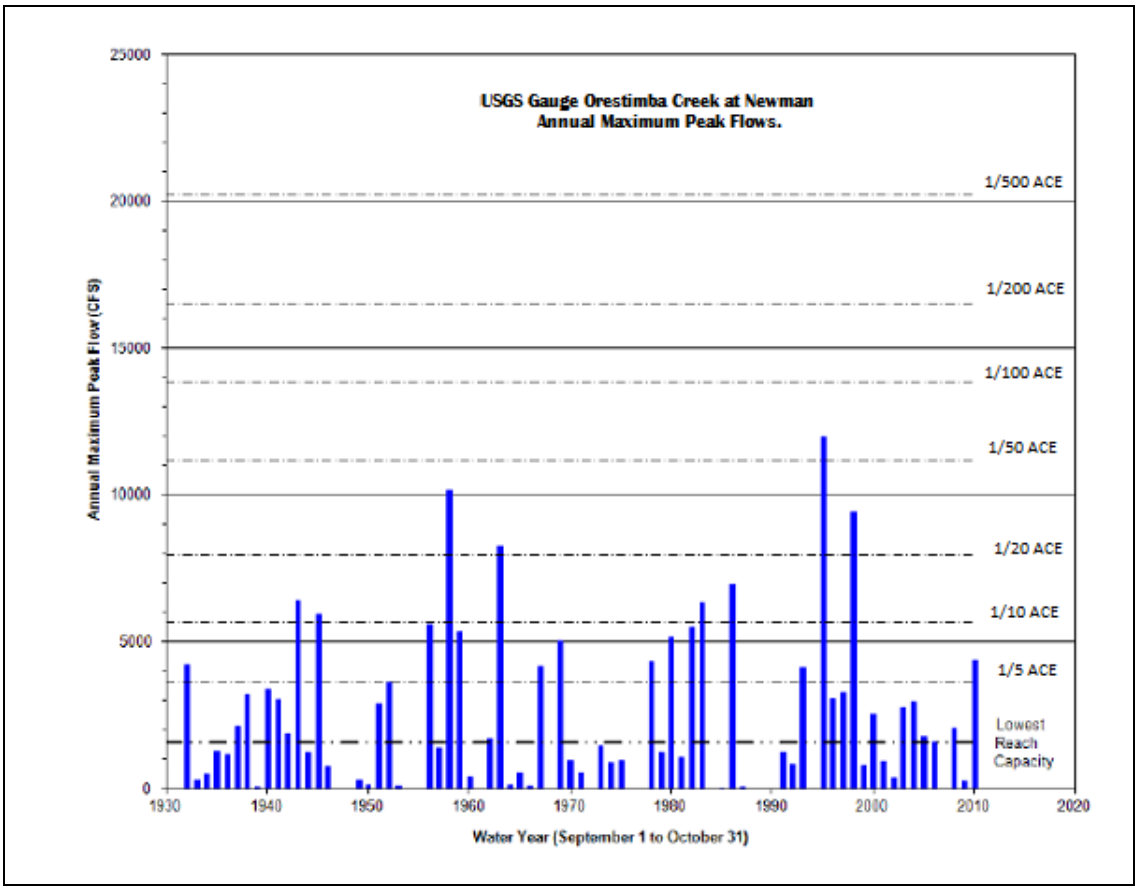


Figure 4-3: Annual Maximum Peak Flows (cfs) - USGS Gauge Orestimba Creek at Newman (1932 to 2007). Source: USGS 2009

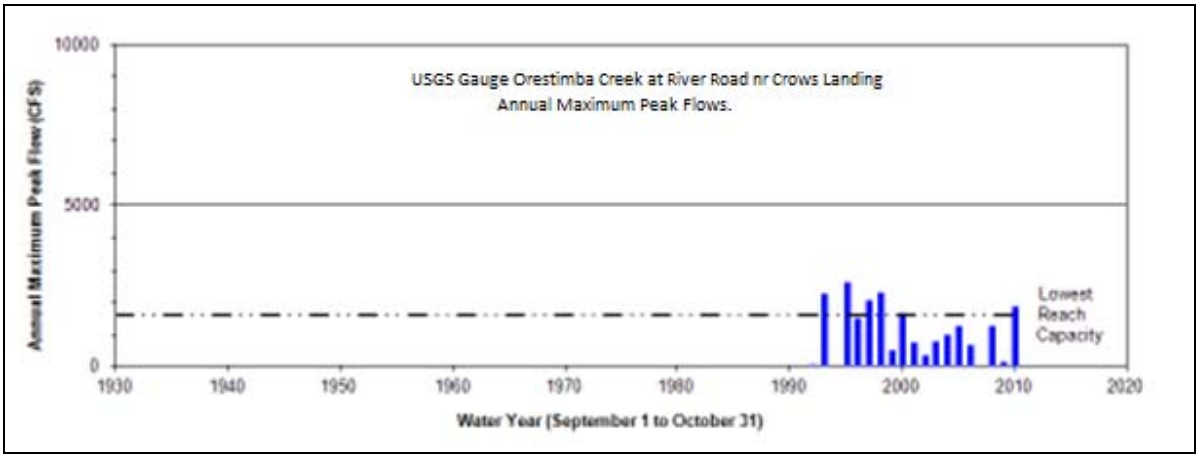


Figure 4-4: Annual Maximum Peak Flows (cfs) - Orestimba Creek at River Road nr Crows Landing (1992 to 2009). Source: USGS 2009

Examination of the stream gauge records confirms that Orestimba Creek is ephemeral in its upper reaches (Table 4-1). Over the 77-year period of record, the average monthly flow at the Orestimba Creek at Newman Gauge is less than 1.0 cfs for the months of June through November. Runoff during the remaining months is sporadic with large volumes (100 to 800 cfs) occurring during winter months of some years and limited to no discharge during most years. In general, runoff begins to appear at this location during mid-November, climbs through December and January, peaks in February and March, and then declines to almost zero in July. August, September, and October are extremely dry months this high on the alluvial fan. Annual stream flow in some years has been zero, with no significant historic trends evident that would indicate a causal relationship.

Table 4-1: Average Monthly Stream Flow

Month	Average Monthly Flow (cfs)	
	Orestimba Creek at Newman Gauge	Orestimba Creek at River Road (Crows Landing)
January	73	89
February	113	122
March	50	70
April	15	53
May	3	42
June	1	25
July	0	24
August	0	19
September	0	12
October	0	29
November	0	30
December	13	22

Source: USGS, 2009

At the Orestimba Creek at River Road Gauge, average monthly flow is consistently higher than the average monthly flow at the Orestimba Creek at Newman Gauge (Table 4-1). Monthly records indicate that peak discharges for several events are lower at the Orestimba Creek at River Road Gauge than at the Orestimba Creek at Newman Gauge. This occurs due to the regulation of flows by channel constriction of the Highway 33 Bridge and the CNRR trestle, which results in a significant portion of flows overtopping the channel between the two gauge sites that does not reenter the channel. The return of irrigation water is the most likely source of flows in the lower reach when nearly no flows are recorded at the Orestimba Creek at

Newman Gauge. A comparison of average annual discharge at each gauge shows similar trends in relative flow volumes (Table 4-2).

Table 4-2: Average Annual Discharge

Year	Average Annual Discharge (cfs)	
	Orestimba Creek at Newman Gauge	Orestimba Creek at River Road (Crows Landing)
1993	45.5	56.8
1994	0.0	15.7
1995	45.0	57.0
1996	33.6	53.9
1997	49.6	94.1
1998	83.4	133.8
1999	4.6	49.5
2000	11.5	35.6
2001	4.5	34.2
2002	33.0	21.7
2003	9.1	15.3
2004	4.9	14.1
2005	26.5	40.4
2006	14.7	53.1
2007	0.0	12.8
2008	14.7	6.95
2009	3.0	19.4

Source: USGS, 2009

Flood Frequency and Floodplain

The Hydrologic Engineering Center (HEC) Flood Frequency Analysis (FFA) computer program was used to compute the annual peak flow frequency curves using 76 years (1932-2007) of peak flow records and 75 years of daily flow records (1933-2007) at the Orestimba Creek at Newman Gauge (Appendix C). The HEC-FFA output is based on a modeled storm event which simulates the volume and duration of flows carried within the creek. Given the 1,800-cfs minimum carrying capacity of Orestimba Creek, each year there is a 20 percent chance (1/5 ACE) that peak flow volumes will result in flooding (Table 4-3). Storm events with a 10 percent chance of occurring each year (1/10 ACE) with a duration of 1 day would also result in flooding.

Table 4-3: Modeled Peak and Average Daily Flows by Flood Frequency

Duration	Flow Volumes (cfs)					
	1/500 ACE	1/200 ACE	1/100 ACE	1/50 ACE	1/10 ACE	1/5 ACE
Peak	20,255	16,533	13,831	11,208	5,679	3,634
1-Day	7,398	6,026	5,035	4,093	2,132	1,405
3-Day	4,825	3,908	3,250	2,627	1,344	876
7-Day	3,039	2,467	2,052	1,657	838	539
15-Day	1,685	1,408	1,196	985	516	334

Source: Appendix C

During flood events that exceed the capacity of the channel, flooding proceeds as shallow to moderate depth sheet flow across the cone-shaped, convex alluvial fan surface, generally following topographic depressions. Floodflow, which is augmented by additional runoff from rainfall on the alluvial fan surface, is then diverted by surface features including roads, highways, canals, and ditches. These features divert flow contrary to the direction it would naturally proceed, most notably toward Newman. Once flow has ponded to the depth of the tops of these features, it overtops the feature and resumes its historical course to the San Joaquin River. Because of its location along Highway 33 and the railroad, Newman is subject to flooding from flow diversion along these features.

Flood damage reduction structures are limited to short segments of earthen levee along the creek bank, drainage ditches, and a recently constructed detention basin and floodwall near Newman. Runoff from agricultural irrigation or excess rainfall flows follows a path of drainage ditches, which have been constructed by local interests to direct flow. These ditches are small earthen features with an extremely small capacity. They serve no significant flood damage reduction function, but do guide small flows along a path of field boundaries, roads, and other man-made features. Because the banks of Orestimba Creek are higher than surrounding fields in the lower reach, most of this flow is carried directly to the San Joaquin River.

Hydraulic conditions were evaluated for delineation of "existing condition" floodplains. The delineation of floodplains involves modeling of the watershed to determine the direction of floodflows and depth of flooding. It indicates ponding and potential "choke point" locations. For instance, the hydraulics of the watershed will determine where flow might break out of the channel and the water's likely flow path. Modeling of the existing condition involved the creation of a hydraulic model of Orestimba Creek and its environs utilizing both USACE's HEC-2 model to determine channel capacity and Tetra Tech, Inc.'s FLO-2D model to evaluate flooding within the study area. The HEC-2 model served as the basis for channel geometry in the FLO-2D model. All significant structures that might restrict flow, such as bridges, siphon crossings, and

culverts, were evaluated. Because the entire length of the channel is incapable of conveying peak flows larger than a 1/10 ACE event, the channel of Orestimba Creek does not play a major role in conveying floodflows. Floodflows not carried in the channel run overland through agricultural and residential properties on their way to the San Joaquin River (Figure 4-5).

Topography used in the modeling effort was based on aerial survey data collected by USACE and Stanislaus County expressly for this study. The majority of the data were collected to support 5-foot contour accuracy, with the exception of areas along the stream between the towns of Patterson and Newman where data were collected to support 2-foot contour accuracy.

Orestimba Creek was modeled from just downstream of Oso Creek (upstream of the canyon mouth) to the San Joaquin River. Flows remain relatively confined between Oso Creek and the gravel pits just upstream of Jorgensen Road. Downstream of Jorgensen Road, the channel capacity diminishes. Initial breakout from the channel occurs at Horseshoe Bend between Anderson Road and the CCID Main Canal, which exhibits a channel capacity of approximately 1,800 cfs.

Flow restriction was modeled for all of the existing obstructions along Orestimba Creek (Tetra Tech, Inc. 2001). Structures modeled include Anderson Road, the CCID Main Canal, the CNRR trestle, Highway 33, Morris Road, Kilburn Road, and River Road. Additional obstructions are created by the embankments of the CNRR trestle, the CCID Main Canal, Anderson Road, Clary Road, Crows Landing Road, Morris Road, and JT Crow Road, and these obstructions were included in the modeling.

No soil hydraulic conductivity or soil suction data are available for the Orestimba Creek watershed. Soil parameters used in the hydraulic modeling were derived from detailed studies conducted by DWR on the Arroyo Pasajero watershed. This watershed exhibits similar characteristics and land uses similar to those of Orestimba Creek.

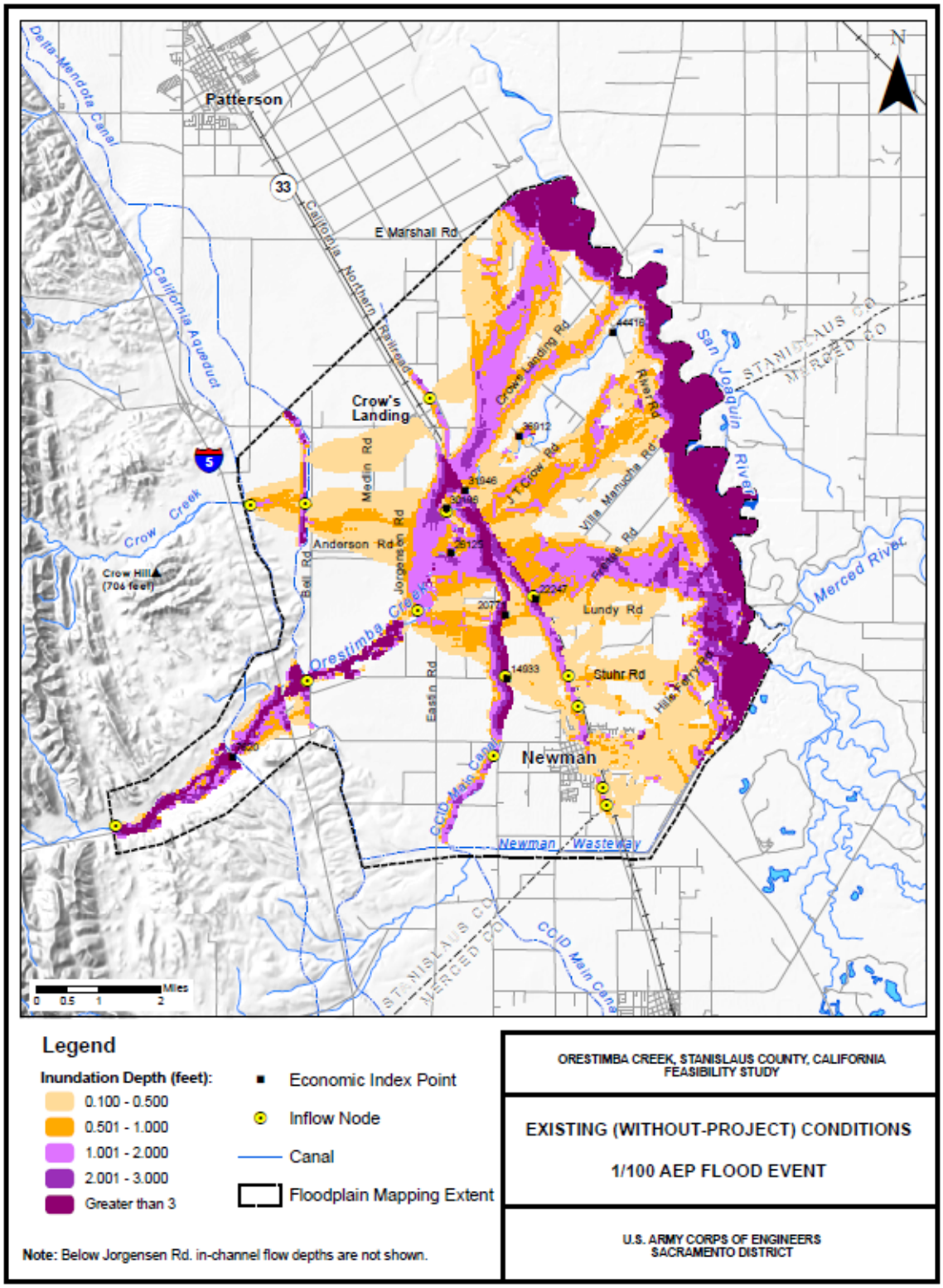


Figure 4-5: 1/100 ACE (100-year) Floodplain of Orestimba Creek

Model calibration was based on the area inundated, as indicated on aerial photographs taken during the flood events of 1995 and 1998. Additional calibration was done using high-water marks generated during these same events. Flood replication, including the area of inundation, was almost exactly the same as those results generated by hydraulic modeling (Tetra Tech, Inc., 2001).

Floodplains were delineated for the 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, and 1/500 ACE events. In all flood scenarios, floodflows exceed channel capacity first at Horseshoe Bend. Downstream flow is somewhat diverted by the CCID Main Canal towards Newman. Eventually, flow diverted by Highway 33 and the CNRR trestle inundates Newman. Flow overtopping Highway 33 and the CNRR continues downslope across fields and farm roads until it reaches the San Joaquin River. Because of the extremely small capacity of the channel, the progression of events during each of these floods is similar; the progressions differ in regards to extent of inundation and depth. All floods between 1/10 and 1/500 ACE events inundate significant areas of agricultural land and residential property.

4.2.5 Water Quality

Surface Waters

Surface waters in the Orestimba Creek watershed include the creek and its tributaries, the California Aqueduct, Delta-Mendota Canal, CCID Main Canal, and secondary canals and irrigation ditches (Figure 4-6). Several tributaries converge with Orestimba Creek in the Diablo Range before it emerges from the foothills, including Red Creek, South Fork Orestimba Creek, North Fork Orestimba Creek, and Oso Creek. The mountainous portion of the watershed catches and delivers the majority of rainfall and runoff evident in the basin. Runoff is substantial after any given amount of rainfall due to the high clay content and shallow depths of soils, which allow for little infiltration of rain water. Most infiltration occurs in the alluvial fan portion of the watershed where soils are sandy and have less clay than those upstream. The California Aqueduct, Delta-Mendota Canal, and CCID Main Canal travel in a general north-to-south direction through the watershed and cross beneath Orestimba Creek via siphons. Although the aqueduct and canals have no direct connection to surface waters, the irrigation water from the canals is indirectly connected to watershed through irrigation return flows. Secondary canals and irrigation ditches generally parallel Orestimba Creek and typically drain into the San Joaquin River.

Surface Water Quality

In the San Joaquin Hydrologic Region, the overarching water quality issues are a result of depleted freshwater flows, municipal and industrial waste water discharges, salt loads in agricultural drainage and runoff, and other pollutants associated with agricultural irrigation and production (such as nutrients, selenium, boron, and organophosphate pesticides) (Central Valley Regional Water Quality Control Board [CVRWQCB], 2007). In urban areas, stormwater

drainage systems may contain heavy metals and chemicals generated from vehicles and yard chemicals from residential and commercial areas.

The Central Valley, which includes Orestimba Creek, has 40 water bodies impaired due to agriculture, including 800 miles of waterways (CVRWQCB, 2007). Relative to other basins, discharges from irrigated lands have their greatest impact in the Central Valley, which covers 40 percent of California's land area, and contains 7 million irrigated acres and at least 25,000 individual agricultural dischargers.

Under Section 303(d) of the Clean Water Act (CWA), the CVRWQCB has developed a Water Quality Control Plan (CVRWQCB, 2007) and maintains a list of impaired waters (CVRWQCB, 2011). The most recent listing cycle ended in 2006. Waters on the 303(d) list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The CWA requires that jurisdictions establish priority rankings for waters on the 303(d) list and develop action plans, incorporating total maximum daily loads (TMDLs), to improve water quality.

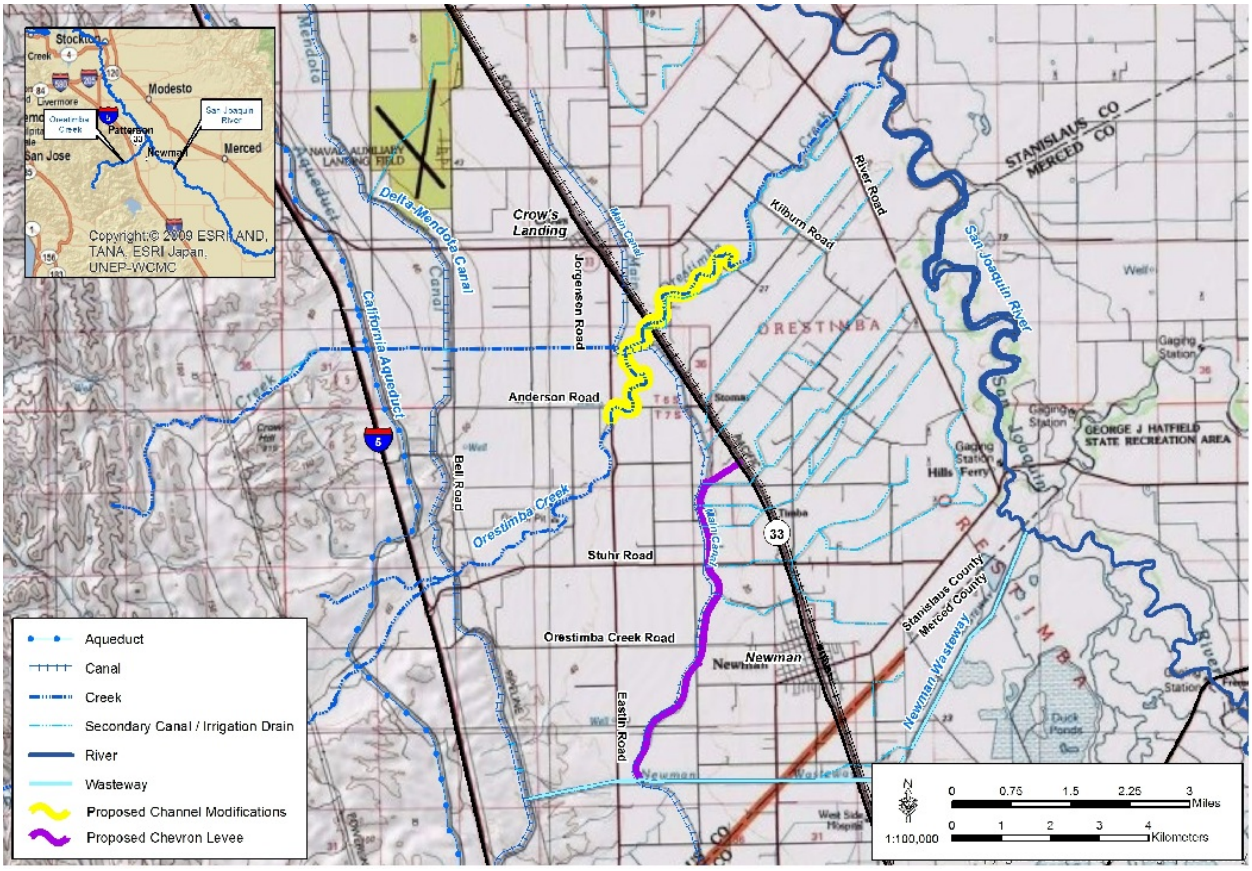


Figure 4-6: Surface Waters in the Orestimba Creek Study Area

The study area is located in the San Joaquin Hydrologic Region. For the purposes of surface water quality monitoring, the CVRWQCB has divided the San Joaquin Hydrologic Region into distinct catchment basins. Orestimba Creek lies within the Greater Orestimba Minor Subarea. The Greater Orestimba Minor Subarea is a 285-square-mile subset of the Northwest Side Subarea located in southwest Stanislaus County and a small portion of western Merced County. It contains the entire Orestimba Creek watershed and the remaining area that drains into the Lower San Joaquin River from the west between the Crows Landing Road Bridge and the confluence of the Merced River, including Little Salad and Crow Creeks. Orestimba Creek is further divided into two segments: one above Kilburn Road and one below Kilburn Road.

The CVRWQCB list of impaired waters includes both monitored segments of Orestimba Creek and the San Joaquin River from the Merced River to the Tuolumne River. Beneficial use of both segments of Orestimba Creek is impaired by high levels of agricultural pollutants including: Azinphos-methyl, Chlorpyrifos, DDE, and Diazinon. The segment below Kilburn Road is also impaired by sediment toxicity of unknown origin and by an unknown toxicity of agricultural origin. Beneficial use of the San Joaquin River is also impaired by high levels of agricultural pollutants including Chlorpyrifos, DDT, and group A pesticides, and is also impaired by high levels of mercury. Designated beneficial uses of the San Joaquin River downstream of the study area include: irrigation; stock watering; industrial processing; canoeing, rafting, and other noncontact recreation; warm freshwater; warm and cold migration; warm spawning; and wildlife habitat. Beneficial use designations of the San Joaquin River are extended to its tributaries, including Orestimba Creek.

CVRWQCB has developed a Water Quality Control Plan for the Sacramento and San Joaquin River Basins and has established the following TMDLs: Central Valley Pesticide TMDL and Basin Plan Amendment; San Joaquin River Organophosphorus Pesticide TMDL; San Joaquin River Dissolved Oxygen TMDL; and the San Joaquin River Upstream Salinity and Boron TMDL. In an effort to address pesticide-related impairments and their effects, CDFG and the California Department of Pesticide Regulation (CDPR) have developed a water monitoring program that encompasses Orestimba and Del Puerto Creeks (Ensminger, 2007). CVRWQCB has initiated a pesticide runoff control program to address Diazanon and Clorpyrifos levels in the region (CVRWQCB, 2007). This program includes load allocations for all National Pollution Discharge Elimination System (NPDES)-permitted discharges and for non-point source discharges. CVRWQCB has also signed a Memorandum of Understanding with the CDPR to ensure that pesticides registered in California are used in a manner that protects water quality and recognizes the need for pest control.

Water quality in Newman is an area of concern because the population is growing quickly and because a large portion of Newman's runoff is discharged into the Newman Wasteway without any water quality treatment. Newman's population reached 10,140 in 2006, and Newman may now become subject to NPDES Phase II Stormwater Program requirements. The Phase II Stormwater Program requirements would require Newman to obtain a permit and develop a stormwater management program designed to prevent harmful pollutants from being carried by stormwater runoff into local water bodies. The program would include public

education, public participation and involvement, illicit discharge detection and elimination, construction site runoff control, post-construction runoff control and pollution prevention, and good housekeeping measures.

4.2.6 Groundwater

The San Joaquin River Hydrologic Region is divided into three groundwater basins, which are divided into nine subbasins totaling 9.7 million acres in area (DWR, 2009). The headwaters of Orestimba Creek are located within the Los Banos Creek Valley basin and the alluvial fan is located in the Delta-Mendota subbasin of the San Joaquin Valley basin. The region heavily relies on groundwater, which accounts for about 30 percent of the annual water supply used for agricultural and urban purposes. Groundwater has been used conjunctively with surface water to meet water needs in the area since the beginning of the region's agricultural development. Groundwater is used when and where surface water is unable to fully meet demands.

Few studies have been conducted in the Los Banos Creek Valley basin. The shallow depth to bedrock in this basin generally prevents storage of a significant amount of groundwater in aquifers, and groundwater is rapidly released into streams and aquifers in the Delta-Mendota subbasin. The soils of the Delta-Mendota subbasin are generally well drained, and groundwater barriers do not appear to exist. Natural recharge is estimated to be 8,000 acre-feet, and applied water recharge is approximately 74,000 acre-feet (DWR, 2009). Annual urban and agricultural extractions are estimated to be 17,000 acre-feet and 491,000 acre-feet, respectively. Other extractions are approximately 3,000 acre-feet, and subsurface outflow has not been determined. Thus, total estimated extraction exceeds total estimated recharge by 429,000 acre-feet.

In the Delta-Mendota subbasin, shallow and saline groundwater occurs within about 10 feet of the ground surface (DWR, 2009). There are also localized areas of high iron, fluoride, nitrate, and boron. Total dissolved solids values in the portion of the subbasin underlying the study area range from 400 to 1,600 milligrams per liter. A total of 47 public supply wells were tested for primary and secondary inorganic contaminants, radiological contaminants, nitrates, pesticides, and volatile organic compounds. Except for secondary inorganic compounds, concentrations exceeded U.S. Environmental Protection Agency (USEPA) maximum contaminant levels (MCL) in less than one percent of the wells. Concentrations of secondary inorganic compounds exceeded the USEPA MCL in nearly 40 percent of tested wells.

4.2.7 Waters of the U.S. and Wetlands

The National Wetland Inventory (NWI) indicates several wetlands within and adjacent to the Orestimba Creek riparian zone; however, there are no NWI wetlands identified in the project area as defined by the proposed chevron levee (Figure 4-7). NWI wetlands are typically delineated using USGS soil surveys and aerial photography and should be verified through a

formal wetland delineation to determine their jurisdictional status. Any wetland delineated by an NRCS office will also be included on the NWI maps.

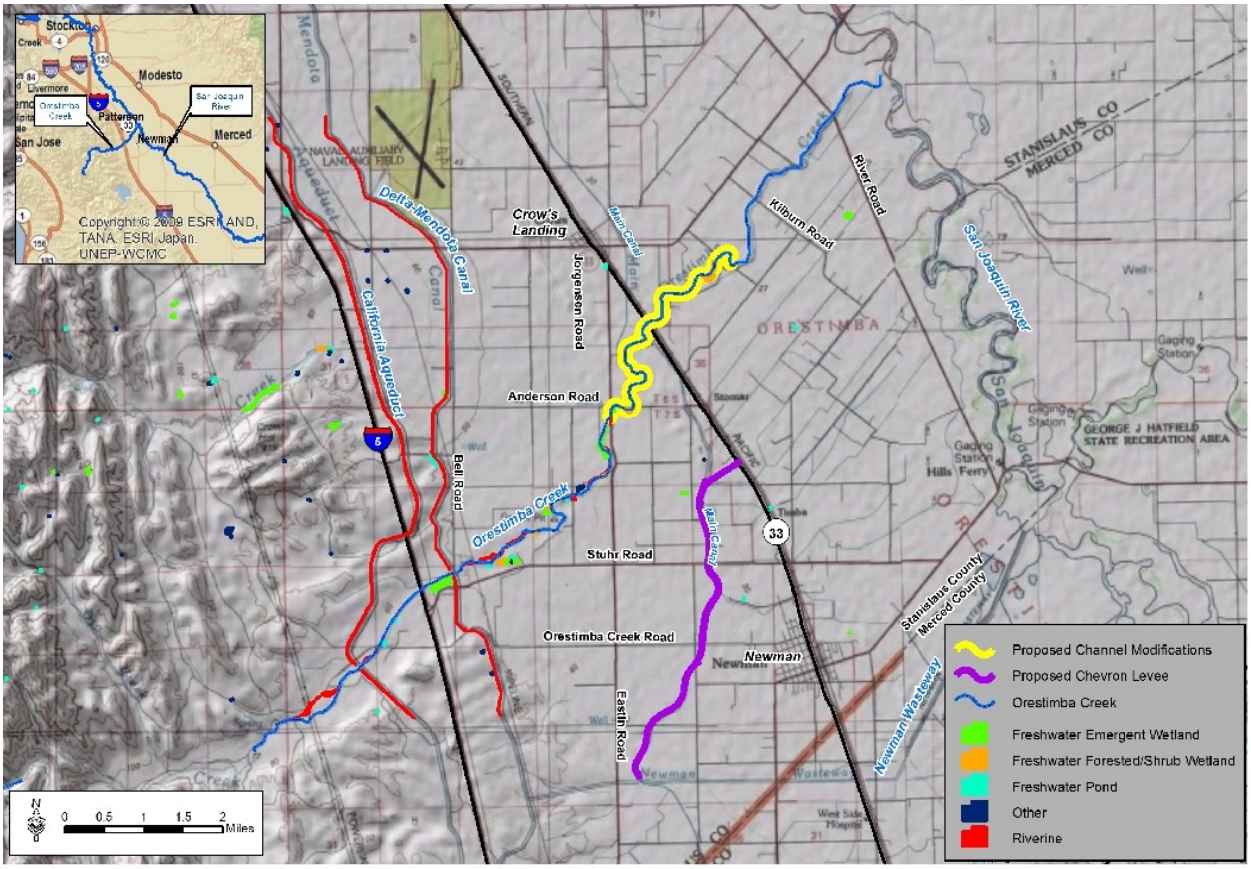


Figure 4-7: NWI Wetlands occurring in the Orestimba Creek Study Area

4.2.8 Air Quality

Orestimba Creek and Newman are located in the San Joaquin Valley Air Pollution Control District (Valley Air District). Air in the Valley Air District does not meet air quality standards for 1-hour and 8-hour ozone (O_3) and particulate matter less than 10 microns in diameter (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) (Table 4-4).

O_3 is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic carbons (VOC), oxides of nitrogen (NO_x), and oxygen. O_3 formulation is enhanced by warm temperatures and sunlight. O_3 is a highly reactive gas that damages lung tissue, reduces lung function, and sensitizes the lung to other irritants. Although stratospheric O_3 shields the earth from damaging ultraviolet radiation, terrestrial O_3 is a highly damaging air pollutant and is the primary source of smog. O_3 is controlled by regulating sources of VOC and

NO_x. NO_x is a brownish, highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. The two primary sources of NO_x are stationary and mobile source fuel combustion.

Table 4-4. Valley Air District Attainment Status

Pollutant	Federal Status	State Status
Ozone - 1 hour	No Federal Standard	Nonattainment/Severe
Ozone - 8 hour	Nonattainment/Extreme	Nonattainment
PM_{10}	Attainment/Maintenance Area	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead (Particulate)	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

Source: Valley Air District, 2011

PM_{10} is composed of dust, ash, soot, smoke, or liquid droplets emitted into the air by industrial sources, fires, construction activities, use of unpaved roads, and by natural sources such as wind-blown dust. The large area of agriculture surrounding Orestimba Creek and Newman is a substantial source of PM_{10}. Small particulates are most likely to cause adverse health effects because they can be inhaled into the thoracic or lower regions of the respiratory tract, where they can cause aggravation of existing respiratory disease and a decline in lung function (USEPA, 2003).

$PM_{2.5}$ can be emitted directly or formed secondarily in the atmosphere (by sulfates from SO_2 emissions and nitrates from NO_x emissions). Health studies have shown a significant association between exposure to $PM_{2.5}$ and premature death from heart or lung disease (USEPA, 2003). Fine particles can aggravate the heart and lungs and have been linked to effects such as cardiovascular symptoms, cardiac arrhythmias, heart attacks, respiratory symptoms, asthma attacks, and bronchitis.

California's State Implementation Plan (SIP) introduces and enforces control measures to reduce emissions of pollutants. Measures to control one criteria pollutant are often utilized to control other non-attainment pollutants. Several control measures in the O_3 SIP are also included in the $PM_{2.5}$ SIP. These measures include controls on fugitive emissions from petroleum and chemical production plants, improvements to school bus fleets, and bans on

burning agricultural wastes. SIPs also include incentive plans to reduce emission from mobile sources such as automobiles, trucks, and construction equipment. These incentive plans apply to both O_3 pollutants and PM pollutants.

Greenhouse Gases and Climate Change

Global climate change refers to a change in the average weather on the earth. Greenhouse Gases (GHGs) are gases that trap heat in the atmosphere. They include water vapor, carbon dioxide (CO_2), methane (CH_4), NO_x, fluorinated gases including chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC), and halons, as well as ground-level O_3 (California Energy Commission, 2007).

The major GHG-producing sectors in society include transportation, utilities (such as coal and gas power plants), industry/manufacturing, agriculture, and residential. End-use sector sources of GHG emissions include transportation (40.7 percent), electricity generation (22.2 percent), industry (20.5 percent), agriculture and forestry (8.3 percent), and other (8.3 percent) (California Energy Commission, 2007). The main sources of increased concentrations of GHG due to human activity include the combustion of fossil fuels and deforestation (CO_2), livestock and rice farming, land use and wetland depletions, landfill emissions (CH_4), refrigeration system and fire suppression system use and manufacturing (CFC), and agricultural activities, including the use of fertilizers (California Energy Commission, 2007).

Final Mandatory GHG Inventory Rule

In response to the Consolidation Appropriations Act (House Resolution [H.R.] 2764; Public Law 110–161), USEPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires large sources that emit 25,000 metric tons (27,557 U.S. tons) or more per year of GHG emissions to report GHG emissions in the U.S., collect accurate and timely emissions data to inform future policy decisions, and submit annual GHG reports to the USEPA. The final rule was signed by the Administrator on September 22, 2009, published on October 30, 2009, and made effective December 29, 2009.

4.2.9 Vegetation Communities

EDAW conducted field surveys of the study area between April and October 2001 (USACE, 2002). The purpose of these surveys was to characterize general biological resources and to determine if sensitive biological resources occur in the project area. Botanical surveys were conducted in the study area west of the California Aqueduct during the weeks of April 23 and July 2, 2001. These surveys included identifying plants, characterizing native plant communities, and assessing the suitability of habitats for special status plant species. Vegetation communities were first delineated on aerial photography and then verified on the ground. Gulf South Research Corporation (GSRC) also conducted biological reconnaissance in August 2008 within the Orestimba Creek Riparian Zone; the results of this study are included in

Appendix B. Vegetation communities within the project area as defined by the proposed chevron levee are discussed below.

Non-native Annual Grassland

This vegetation community is equivalent to the California annual grassland series of the CNPS system. Dominant plant species observed were limited to a few non-native, herbaceous species such as wild oats (*Avena fatua*), slender wildoat (*A. barbata*), soft chess, foxtail barley (*Hordeum marinum*), Italian ryegrass (*Lolium multiflorum*), foxtail fescue, hare barley, ripgut grass (*Bromus diandra*), redstem filaree (*Erodium cicutarium*), smooth cat's ear (*Hypochoeris glabra*), and shortpod mustard (*Hirschfeldia incana*), as well as many other introduced grasses and forbs.

Agricultural Lands

This vegetation community is intensively managed row crops and tree orchards. Plant species include domesticated crop species such as alfalfa, beans, broccoli, cantaloupe, oats, sugarbeet, tomato, winter wheat, and orchards of walnut, almond, apricot, and cherry trees. Besides these crops, other vegetation found along fence lines, roads, and fallowed fields include mustard, common cocklebur, common sunflower, yellow starthistle, and other ruderal (weedy) species.

Developed Areas

Nonnative communities occur in areas developed for urban use in the project area. Developed areas include sidewalks, roadways, buildings, driveways, parking lots, and recreational trails. This community provides little to no habitat for wildlife, and has little to no vegetation and ground cover.

4.2.10 Wildlife and Fisheries

Wildlife

EDAW (2002) conducted field surveys of the study area between April and October 2001, and GSRC conducted a reconnaissance in August 2008. Additional observational surveys were conducted by USFWS personnel in April 2012. The purpose of these surveys was to characterize general biological resources and to determine if sensitive biological resources occur. Other wildlife species were also noted during these surveys and their occurrence within each vegetation community is provided in the following paragraphs.

Wildlife species commonly observed in the Non-native Annual Grassland in the study area include black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), Heermann's kangaroo rat (*Dipodomys heermanni*), lark sparrow (*Chondestes grammacus*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila*

alpestris), gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus viridis helleri*). Additional species were also recorded in the field surveys, including badger (*Taxidea taxus*) and coyote (*Canis latrans*). While these species were recorded in other parts of the study area outside of the agricultural areas, they may occasionally forage in nearby agricultural lands. Agricultural lands also provide important foraging habitat for many species of raptors in the study area.

Agricultural land and lands dominated by urban development support many wildlife species, most of which are highly adapted to these disturbed environments. Agricultural land is not generally considered important wildlife habitat, but is used by many species, particularly as foraging habitat. Wildlife found in agricultural areas varies by crop type and time of year. Animals observed in these areas included Audubon's cottontail, California vole (*Microtus californicus*), western scrub-jay (*Aphelocoma coerulescens*), American crow (*Corvus brachyrhynchos*), barn owl (*Tyto alba*), and yellow-billed magpie (*Pica nuttalli*). Wildlife found in urban areas is often dependent upon surrounding land uses and the presence or absence of nearby natural vegetation. In the more urbanized areas, a large percentage of the wildlife can be made up of exotic species such as rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), house mouse (*Mus musculus*), and brown rat (*Rattus norvegicus*).

Fisheries

While the San Joaquin River above and below Orestimba Creek is designated Essential Fish Habitat (EFH) for Pacific salmon under the Magnuson-Stevens Fisheries Conservation and Management Act (Pacific Fishery Management Council, 1999), the project area as defined by the proposed chevron levee is not considered EFH. The CCID canal may contain native fish species, including Sacramento sucker (*Catostomus occidentalis*) and Sacramento pikeminnow (*Ptychochelius grandis*). A variety of introduced species may also be present in the CCID canal, including various species of catfish, carp, mosquitofish, and members of the Centrarchidae family such as green sunfish, black crappie (*Pomoxis annularis*), and largemouth bass (*Micropterus salmoides*). Amphibian species observed include the American bullfrog (*Lithobates catesbeianus*) and the American toad (*Anaxyrus americanus*).

4.2.11 Special Status Species

Certain special status species and their habitats are protected by Federal, State, or local laws and agency regulations. The Federal Endangered Species Act (ESA) of 1973 (50 CFR 17) provides legal protection for plant and animal species in danger of extinction. This act is administered by USFWS and NMFS. The California Endangered Species Act (CESA) of 1977 parallels the Federal ESA and is administered by CDFG. Other special status species lack legal protection, but have been characterized as "sensitive" based on policies and expertise of

agencies or private organizations, or policies adopted by local government. Special-status species are those that meet any of the following criteria:

- Listed or candidate for listing under the Federal ESA (50 CFR 17).
- Listed or candidate for listing under CESA.
- Nesting bird species and active nests of birds listed under the Migratory Bird Treaty Act.
- Species listed in the Bald and Golden Eagle Protection Act.
- Essential Fish Habitat listed under the Magnuson-Stevens Act.
- Fully protected or protected species under stated CDFG code.
- Wildlife species of special concern listed by the CDFG.
- Plant species listed as Rare under the California Native Plant Protection Act.
- Plant species listed by the California Native Plant Society.
- Species protected by other local ordinances, goals, and policies.

Lists of special status species and candidate species that may be found in the United States Geological Survey quad Newman were obtained November 5, 2012 via the USFWS website and the California Natural Diversity Database (CNDDB). The USFWS and CNDDB lists are included in Appendix B, as well as in Table 4-5.

Table 4-5: Special Status Species and Critical Habitats

Species/Critical Habitat	Status	Potential to Occur*
INVERTEBRATES		
Vernal pool fairy shrimp *Branchiecta lynchi*	Threatened	None; primarily occurs in vernal pools, which are located on the east side of the county
Critical Habitat	Final	None
Vernal pool tadpole shrimp *Lepidurus packardi*	Endangered	None; primarily occurs in vernal pools, which are located on the east side of the county
Critical Habitat	Final	None

Species/Critical Habitat	Status	Potential to Occur*
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	Federally Threatened	Low; blue elderberry shrubs have been known to occur in the area but habitat suitability is limited by fragmentation and use of pesticides. No species occurrences identified by Critical Habitat Portal or biological surveys
FISH		
Green sturgeon *Acipenser medirostris*	Federally Threatened	None; spawns in rivers north of the San Francisco Bay
Delta smelt *Hypomesus transpacificus*	Federally Threatened	None; occurs in the San Joaquin River about 50 miles downstream of Orestimba Creek
West Coast Steelhead, California Central Valley Distinct Population Segment (DPS) *Oncorhynchus mykiss*	Federally Threatened	None; this anadromous fish is known to occur in the San Joaquin River above and below its confluence with Orestimba Creek; due to its flashy hydrology, suitability of Orestimba Creek is limited but could provide habitat in some years
Critical Habitat	Final	None; water quality of San Joaquin River above and below Orestimba Creek is a primary constituent element of critical habitat
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	Federally Threatened	None; this anadromous fish is known to occur in the San Joaquin River above and below its confluence with Orestimba Creek; due to its flashy hydrology, suitability of Orestimba Creek is limited but could provide habitat in some years
Central Valley winter-run Chinook salmon *Oncorhynchus tshawytscha*	Federally Endangered	None; this anadromous fish is known to occur in the San Joaquin River above and below its confluence with Orestimba Creek; due to its flashy hydrology, suitability of Orestimba Creek is limited but could provide habitat in some years
AMPHIBIANS		
California tiger salamander, central population *Ambystoma californiense*	Federally Threatened	None; suitability of habitats is limited by presence of predators such as bullfrogs and fish which were observed in standing pools of water during 2001 and 2008 biological surveys
Critical Habitat	Final	None

Species/Critical Habitat	Status	Potential to Occur*
California red-legged frog *Rana aurora draytonii*	Federally Threatened	None; focused surveys of the upper portion of Orestimba Creek were conducted by EDAW in 2001, and the species was not detected; habitat suitability limited by predators such as bullfrogs and predatory fish observed in standing pools of water during 2008 biological surveys
REPTILES		
Blunt-nosed leopard lizard *Gambelia (=Crotaphytus) sila*	Federally Endangered	None; no longer present in areas that have been significantly altered by agriculture and urban development
Giant garter snake *Thamnophis gigas*	Federally Threatened	None; Orestimba Creek riparian area is somewhat limited in suitability due to a general lack of basking areas and upland refugia, and the species is not known to occur within Orestimba Creek but has been recently sighted in San Joaquin Valley
MAMMALS		
Fresno kangaroo rat *Dipodomys nitratoides exilis*	Federally Endangered	None; there are no known populations in Stanislaus County
San Joaquin kit fox *Vulpes macrotis mutica*	Federally Endangered	Low; the CCID embankment may be used as a migratory pathway between existing populations
BIRDS		
Tricolored blackbird *Agelaius tricolor*	SSC	Low; occurs in marshes above the Delta-Mendota Canal, may utilize agricultural lands
Western burrowing owl *Athene cunicularia*	SSC	Low; occurs in grasslands above Delta-Mendota Canal, may utilize agricultural lands
Swainson's hawk *Buteo swainsoni*	State Threatened	Moderate; occurs in woodlands upstream of Delta-Mendota Canal
Mountain plover *Charadrius montanus*	SSC	Low; could occur in grasslands and plowed fields during winter

Species/Critical Habitat	Status	Potential to Occur*
California horned lark *Eremophila alpestris*	SSC	Low; occurs in grasslands upstream of Delta-Mendota Canal, may utilize agricultural lands
Loggerhead shrike *Lanius ludovicianus*	SSC	Low; occurs in grasslands upstream of Delta-Mendota Canal, may utilize agricultural lands
PLANTS		
Hoover's spurge *Chamaesyce hooveri*	Threatened	None; primarily occurs in vernal pools, which are located on the east side of the county
Critical Habitat	Final	None
Colusa grass *Neostapfia colusana*	Threatened	None; primarily occurs in vernal pools, which are located on the east side of Stanislaus
Hairy Orcutt grass *Orcuttia pilosa*	Endangered	None; primarily occurs in vernal pools, which are located on the east side of the county
Critical Habitat	Final	None
Hartweg's golden sunburst *Pseudobahia bahiifolia*	Endangered	None; remaining populations are concentrated in La Grange east of San Joaquin River
Greene's tuctoria *Tuctoria greenei*	Endangered	None; extirpated from Stanislaus County
Critical Habitat	Final	None
Fleshy owl's-clover *Castilleja campestris ssp. succulenta*	Threatened	None; occurs in beds of vernal pools in valley grasslands in the eastern San Joaquin Valley
Critical Habitat	Final	None

Source: CNDDB, 2012 and USFWS, 2012
* None = no suitable habitat or extirpated; Low = potentially suitable habitat, but no record of occurrence in potentially affected area; Confirmed = suitable habitat with known occurrence in potentially affected area
SSC: State Species of Special Concern

Of the species identified in the study area, only eight have potential to occur in the project area as defined by the area affected by the proposed chevron levee. These species are briefly discussed below.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) is patchily distributed throughout the remaining riparian forests of the Central Valley from Redding to Bakersfield. The VELB appears

to be only locally common (found in population clusters that are not evenly distributed across the Central Valley). Extensive loss of California's Central Valley riparian forests has occurred since 1900, declining by 80 to 96 percent depending on the region (USFWS, 2006). Low density and limited dispersal capability may cause the VELB to be particularly vulnerable to population isolation as a result of habitat fragmentation. Insecticide and herbicide use in agricultural areas and along road rights-of-way may be factors limiting the VELB's distribution. The age and quality of individual elderberry shrubs as a habitat for the VELB may be a factor in its limited distribution. Numerous blue elderberry shrubs were observed within the intact portions of the Orestimba Creek riparian zone. However, the fragmented nature of these habitats and the use of insecticides in adjacent agricultural fields likely limit the suitability of the study area for this species. The California Natural Diversity Database (CNDDB) records several occurrences of this species in Stanislaus County east of the San Joaquin River (CNDBB 2011).

USFWS released a 5-year status review for the VELB on October 2, 2006 (USFWS, 2006). This review reported an observed population increase and the concurrent protection and restoration of several thousand acres of riparian habitat suitable for VELB. The USFWS status review determined that this species is no longer in danger of extinction, and recommended that the species no longer be listed under the Federal ESA. This recommendation is not a guarantee that the species will be delisted, however, because formal changes in the classification of listed species require a separate USFWS rulemaking process distinct from the 5-year review. In August 2011, USFWS initiated a status review to determine if delisting is warranted (USFWS, 2011). On October 2, 2012, USFWS announced a proposed rule to remove the VELB from the Federal List of Endangered and Threatened Wildlife. This proposed rule is currently in public review.

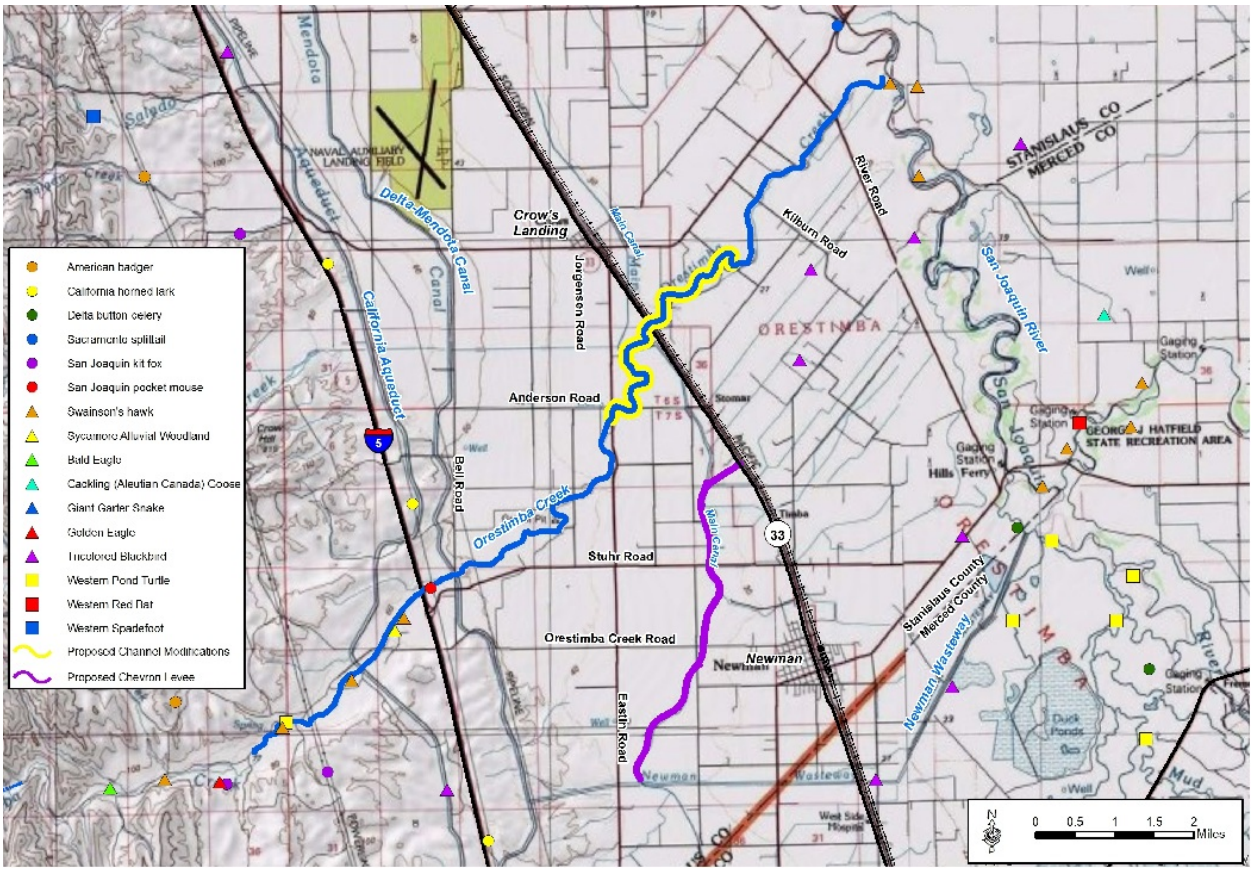


Figure 4-8: CNDDB Occurrences within the Study Area

San Joaquin Kit Fox

The San Joaquin Kit Fox inhabits grasslands, scrub and shrub communities, and agricultural lands. They will use multiple dens in a year, often enlarging holes started by ground squirrels. They will also use man-made structures such as culverts and pipes with small enough entrances to exclude coyotes. While the project area as defined by the proposed chevron levee is unlikely to provide habitat for the San Joaquin Kit Fox, they may use the CCID embankment as a migratory pathway.

Tricolored Blackbird

Tricolored blackbirds nest in dense emergent or riparian vegetation, especially where cattails and bulrush (*Scheonoplectus* spp.) are dominant (Beedy, 2008). This species was occasionally observed during 2001 biological surveys and numerous CNDDB records occur within Stanislaus County, with one record near the California Aqueduct southwest of Newman and three records located within agricultural fields east of Highway 33 (CNDBB, 2011).

Western Burrowing Owl

In California, the western burrowing owl can be found throughout the Central Valley, in the interior portion of the Coast Ranges, and along the coast (Howard, 1996). The population of burrowing owls has declined primarily because native grassland habitats have been converted for agricultural uses. Current threats to remaining populations include urban development and conversion from agricultural crop types that are compatible with burrowing owl occurrence to those that are incompatible. Optimal habitat conditions include open, dry, and nearly level grasslands or prairies. In the Central Valley, burrowing owls often nest along roadsides adjacent to agricultural fields, along field borders, in annual grasslands and dryland pastures, and along levee embankments that are open to adjacent fields. The species was observed above the Delta-Mendota Canal in the 2001 surveys, and CNDDB records also indicate occurrences near Salado Creek and Del Puerto Canyon (CNDBB, 2011). Although not observed near Orestimba Creek below the Delta Mendota Canal, surrounding agricultural fields could provide suitable habitat.

Swainson's Hawk

Swainson's hawks prefer to nest in riparian areas with isolated trees bordered by suitable foraging habitat (grasslands, active agriculture, or fallow fields) (Johnsgard, 1990). Agricultural fields provide important foraging habitat for Swainson's hawks. Alfalfa, fallow fields, dry and irrigated pastures, and other low-growing row crops (including corn after harvest) are preferred foraging habitats for Swainson's hawks. Swainson's hawks are summer residents in the Central Valley, and typically arrive in April to breed. The species was observed upstream of the Delta-Mendota Canal in 2001 and 2008. There are numerous CNDDB occurrences of Swainson's hawk throughout the Orestimba Creek riparian area (CNDBB, 2011) .

Mountain Plover

From September through March, mountain plovers spend the winters in northern California (Knopf and Rupert, 1995). In order of preference, habitats include alkali flats, heavily grazed native grasslands, and recently cultivated croplands. Alkali flats are virtually non-existent and were historically found in the eastern half of the San Joaquin Valley. Mountain plovers remain dependent upon alkali flats, especially in October and November, and the lack of these habitats near Orestimba Creek may limit the suitability of secondary habitats found in agricultural fields. CNDDB records indicate one occurrence near Turlock Lake approximately 10 miles east of the San Joaquin River (CNDBB, 2011).

California Horned Lark and Loggerhead Shrike

The California horned lark and the loggerhead shrike both use grasslands for foraging and nest in shrubs (American Ornithologists Union, 1983). Both species were commonly observed during 2001 biological surveys in grasslands and riparian area surrounding Orestimba

Creek upstream of the Delta-Mendota Canal. CNDDB records indicate a loggerhead shrike occurrence near Patterson and the Delta-Mendota Canal approximately 10 miles north of Orestimba Creek, and California horned lark occurrences in the vicinity of Orestimba Creek near the California Aqueduct and near the Newman Wasteway (CNDBB, 2011).

4.2.12 Invasive Plants and Noxious Weeds

Of the approximately 1,400 non-native plant species occurring in California, the California Invasive Plant Council has identified approximately 200 species of invasive plants that are considered a threat to wildlands based upon their ecological impact and invasive potential (California Invasive Plant Council, 2010). Wildlands are public and private lands that support native ecosystems, including grazed rangeland and active timberland. A total of 22 species considered to be a threat to wildlands were observed within the study area. Giant reed (Figure 4-9), yellow star-thistle, and common fig (*Ficus carica*) are classified as invasive plants having severe impacts. Curly doc, black mustard (*Brassica nigra*), ripgut grass, Italian thistle (*Carduus pycnocephalus*), tocalote (*Centaurea melitensis*), Bermuda grass (*Cynodon dactylon*), Tasmanian blue gum (*Eucalyptus globulus*), Mediterranean barley (*Hordeum marinum* subsp. *gussoneanum*), hare barley, smooth cat's-ear (*Hypochoeris glabra*), tree tobacco, olive (*Olea europa*), and foxtail fescue are classified as having moderate impacts. Depending on the species, tamarisk is classified as either limited or severe in impacts and invasiveness. The remaining invasive species identified in the study are classified as having limited impacts.

Figure 4-9: Giant Reed along Agricultural Margins in the Lower Reach of Orestimba Creek

The California Department of Food and Agriculture lists 171 plants as noxious weeds (3 CCR § 4500). A noxious weed is defined as any plant species that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate. Any area that is infected with any pest, including noxious weeds, is considered a public nuisance, is unlawful for any persons to maintain, and should be abated (California Food and Agriculture Code Sections 5402-5403).

Within the project area as defined by the proposed chevron levee, at least three noxious weeds occur: yellow-star thistle, Italian thistle, and Bermuda grass. Each of these species is given a rating of C by the California Department of Food and Agriculture, and as such they are not subject to State-enforced action outside of nurseries, except to retard spread.

4.2.13 Socioeconomics and Environmental Justice

The study area is located in the southwestern portion of Stanislaus County, in what is referred to by the U.S. Census Bureau (USCB) as the Newman Division. Orestimba Creek stretches approximately 7.5 miles within the Newman Division after having left the foothills of the Diablo Mountain Range. It is estimated that in the 500-year flood event the floodplain would encompass approximately 20,000 acres, including Newman (Appendix C). Newman is home to the world's first school bus company. It is also home to some of California's most efficient and important agricultural industries, such as tomato and vegetable processing, cheese manufacturing, and turkey hatching. The area is acknowledged for crop diversity and productivity, which can be accredited to a combination of exceptional factors such as soil quality, air quality, climate, and water supply.

Population and Diversity

Over the last decade, Newman grew much faster than Stanislaus County and California, increasing by more than 44 percent from 7,093 in 2000 to 10,224 in 2010 (USCB, 2000 and 2010) (Table 4-6). Stanislaus County experienced a higher population growth rate than California as a whole, and some of this growth is attributable to growth in Newman.

The populations of Newman, Stanislaus County, and California are all predominantly comprised of minority races. Persons reporting in 2010 that they are "white, not Hispanic or Latino" make up approximately 32 percent of the population of Newman, 47 percent of the population of Stanislaus County, and 40 percent of the population of California. Newman is more than 61 percent Hispanic/Latino, while Stanislaus County is approximately 42 percent Hispanic/Latino. Relative to California, a substantial portion of growth experienced in Stanislaus County, and especially Newman, can be accounted for by increases in minority populations, primarily by individuals of Hispanic or Latino origin. Newman's Hispanic/Latino population grew by more than 72 percent from 2000 to 2010, compared to 52 percent in Stanislaus County and 28 percent in California over the same decade.

Table 4-6: California, Stanislaus County, and Newman Population (2000 & 2010)

Population	2000	Percent	2010	Percent	Percent Change
California	**33,871,648**		**37,253,956**		**10.0**
White, not Hispanic or Latino	15,816,790	46.7	14,956,253	40.1	-5.4
Hispanic or Latino	10,966,556	32.4	14,013,719	37.6	27.8
Other Minority*	7,088,302	20.9	8,283,984	22.2	16.9
Stanislaus County	**446,997**		**514,453**		**15.1**
White, not Hispanic or Latino	256,001	57.3	240,423	46.7	-6.1
Hispanic or Latino	141,871	31.7	215,658	41.9	52.0
Other Minority	49,125	11.0	58,372	11.3	18.8
Newman	**7,093**		**10,224**		**44.1**
White, not Hispanic or Latino	2,987	42.1	3,319	32.5	11.1
Hispanic or Latino	3,648	51.4	6,299	61.6	72.7
Other Minority	458	6.5	606	5.9	32.3

Source: USCB, 2000 and 2010.
* "Other Minority" includes the Black or African American, American Indian & Alaska Native, Asian, Native Hawaiian & Other Pacific Islander, Other Race Alone, and Two or More Races categories.

Income and Poverty

California's 2009 per capita personal income ($42,395) was above the national average per capita income of $39,635 by nearly 10 percent (Table 4-7). However, the per capita personal income in Stanislaus County of $31,248 was only 79 percent of the national average. Although the Newman median household income was noticeably below the median household income for California, median household income in Newman and Stanislaus County are very near the U.S. average (American Community Survey [ACS], 2010). As discussed below, California supports a higher proportion of high-salary occupations statewide when compared to the more rural areas of Newman and Stanislaus County. Median household income for Newman is slightly greater than the county. The ACS estimates the 9.9 percent poverty rate for Newman, which is noticeably lower than the 17.0 percent poverty rate for Stanislaus County. California's poverty rate is similar to the U.S. rate, 14.2 and 14.3 percent, respectively.

Table 4-7: Newman, Stanislaus County, California and U.S. Income and Poverty (2009*)

Income and Poverty	Newman	Stanislaus County	California	U.S.
Per capita personal income **		$31,248	$42,395	$39,635
Per capita income as a percent of U.S.		78.8%	107.8%	
Median Household Income (2005-2009)	$49,856	$48,550	$58,925	$50,221
Persons of all ages below poverty level, percent, 2005-2009	9.9%	17.0%	14.2%	14.3%

Source: USCB, 2010; ACS 2010
* Estimates for 2009 reflect county population estimates available as of April 2010.
** Per capita personal income was computed using Census Bureau midyear population estimates.
Personal and per capita state and local area dollar estimates are in current dollars (not adjusted for inflation).
BEA does not calculate personal or per capita income for small communities, so these data are not available for Newman.

Employment

The proportion of individuals employed within each occupational category listed by the USCB is relatively similar for California, Stanislaus County, and Newman (Table 4-8). California employs a greater proportion of individuals in the management, professional, and related occupations relative to Stanislaus County and Newman. The service occupations and sales and office occupations are nearly equally represented among the three geographic areas, with Newman providing the lowest proportion of employment in these two categories. Farming, fishing, and forestry occupations provide a greater proportion of employment in Stanislaus County, and especially Newman, than in California as a whole. In Newman, this occupational group did not grow as fast as other groups over the last decade. Construction, extraction, maintenance, and repair occupations, as well as production, transportation, and material moving occupations, each account for a relatively large proportion of jobs in Stanislaus County and Newman, and the proportion of jobs in each of these categories has increased over the last decade.

USACE estimated that approximately 18,400 acres of agricultural land exist within the 1/500 ACE floodplain (Appendix C). Agricultural use consists primarily of orchards, row crops, and field crops. About 3,400 acres of the affected floodplain is devoted to high-value orchard production with about 8,500 acres planted annually, to crops including tomatoes, broccoli, beans, and other crop types. The remaining acreage is primarily devoted to field crops such as pasture and alfalfa hay. Much of the cropland is plowed and planted annually, with a small percentage left fallow. Through a farm budget analysis, USACE estimated agricultural damages to be approximately $1.2 million as a result of a 1/5 ACE storm event and approximately $7.1 million as a result of a 1/100 ACE storm event (Appendix C). The farm budget analysis included estimates of damages to equipment and crops, loss of net income during reestablishment of lost acreage, removal of trash, and reestablishing the land to pre-flood conditions.

Table 4-8: California, Stanislaus County, and Newman Employment by Occupation

Occupation	2000		2005-2009	
	Individuals	Percent	Individuals	Percent
California				
Management, professional, and related occupations	5,295,069	36.0	5,938,977	35.9
Service occupations	2,173,874	14.8	2,827,174	17.1
Sales and office occupations	3,939,383	26.8	4,221,825	25.5
Farming, fishing, and forestry occupations	196,695	1.3	229,497	1.4
Construction, extraction, and maintenance occupations	1,239,160	8.4	1,478,041	8.9
Production, transportation, and material moving occupations	1,874,747	12.7	1,855,192	11.2
Stanislaus County				
Management, professional, and related occupations	46,182	26.5	55,785	27.1
Service occupations	26,856	15.4	34,131	16.6
Sales and office occupations	44,706	25.6	52,261	25.4
Farming, fishing, and forestry occupations	6,226	3.6	6,512	3.2
Construction, extraction, maintenance, and repair occupations	19,877	11.4	23,601	11.5
Production, transportation, and material moving occupations	30,481	17.5	33,788	16.4
Newman				
Management, professional, and related occupations	548	23.7	954	24.2
Service occupations	306	13.3	473	12.0
Sales and office occupations	486	21.1	827	21.0
Farming, fishing, and forestry occupations	237	10.3	244	6.2
Construction, extraction, and maintenance occupations	280	12.1	611	15.5
Production, transportation, and material moving occupations	451	19.5	826	21.0

Source: USCB, 2010; ACS, 2010

Environmental Justice

EO 12898, Environmental Justice, was issued by President Clinton on February 11, 1994. Objectives of the EO, as it pertains to this assessment, include development of Federal agency implementation strategies, identification of minority and low-income populations where proposed Federal actions have disproportionately high and adverse human health and environmental effects, and participation of minority and low-income populations.

Accompanying EO 12898 was a Presidential Transmittal Memorandum that referenced existing Federal statutes and regulations to be used in conjunction with EO 12898. The memorandum addressed the use of the policies and procedures of NEPA. Specifically, the memorandum indicates that, "Each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. section 4321, et.seq."

Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, or Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low-income populations as of 2010 are those whose income are $22,050 for a family of four and are identified using the Census Bureau's statistical poverty threshold. USCB defines a "poverty area" as a Census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. This is significant because the social and economic welfare of minority and low-income populations may be positively or disproportionately impacted by the proposed action alternatives and because of public concerns about the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of Federal laws, regulations, policies, and actions. A potential disproportionate impact may occur when the percent minority in the study area exceeds 50 percent and/or the percent low-income exceeds 20 percent of the population. Additionally, a disproportionate impact may occur when the percent minority and/or low-income in the study area are meaningfully greater than those in the reference community. The State of California, Stanislaus County, and Newman all had less than 20 percent of the population below the poverty level, while the poverty rate in Newman was a relatively low 9.9 percent (Table 4-9).

Table 4-9. Minority Population and Poverty Data

Location	Minority Population (percent)	All Ages in Poverty (percent)
California	59.9	14.2
Stanislaus County	53.2	17
Newman	67.5	9.9

Source: USCB 2010 and ACS 5-Year Estimates, 2005-2009.

4.2.14 Land Use

Above the study area, the headwaters of the Orestimba Creek watershed are in open space usage, as very little of the mountainous portion is suitable for development. Open space land uses in the headwaters include ranching, recreation, and ecological preservation, with a small portion of the watershed bisected by roads and site development. The Nature Conservancy manages the 33,000-acre Simon-Newman Ranch as an ecological reserve. California State Parks operates Henry Coe State Park, which is located nearly 20 miles above the study area on South Fork Orestimba Creek. CDFG manages portions of Orestimba Creek and the surrounding grasslands upstream of the study area above the Delta-Mendota Canal.

Downstream of the Delta-Mendota Canal, land use within the Orestimba Creek floodplain is characterized by scattered rural-residential development and isolated centers of urban development surrounded by extensive agricultural development. Gravel mining, located just downstream of the Delta-Mendota Canal, is the only in-channel land use activity in the study area. In the lower reach, where overbank flooding is less common, houses and associated structures are located near both banks of the creek.

Newman and Crows Landing

Newman and the Village of Crows Landing include commercial, government, and residential land uses. Newman is a small town with a vibrant historic downtown surrounded predominantly by single-family residential neighborhoods and also by agricultural and ranch lands (Newman, 2008). The downtown is centered along Main Street and consists of one- and two-story commercial buildings, many of which are historic and dating from the early 20th century. The area east of Highway 33, extending from the center of town to Newman's southern boundary, is predominantly in industrial and commercial use.

An inventory of structures identified a total of 2,087 parcels with structures located within the 1/500 ACE floodplain of Orestimba Creek (Appendix C). The results of this inventory are shown in Table 4-10. Crows Landing includes a relatively small area of industrial, commercial, and residential land uses. The shipping yard along the railroad at Crows Landing plays an important role in the import and export of agricultural supplies and commodities.

Table 4-10: Number of Parcels with Structures within the 1/500 ACE Floodplain by Land Use

Economic Impact Area	Single-Family Residence	Multiple-Family Residence	Commercial	Industrial	Public	Total
Rural	146	0	0	0	0	146
Urban	1,657	173	75	26	10	1,941
Total	1,803	173	75	26	10	2,087

Source: Appendix C

Newman has established four increasingly inclusive areas which define the extent of planning efforts relative to anticipated development over time (Figure 4-10). The city limits define the area of lands that are already annexed. The primary SOI defines the area that is anticipated to be annexed and would accommodate urban development for the next 10 years (through 2016). The SOI defines the area expected to be annexed and developed for urban land use over the next 20 years. The Newman General Plan anticipates and plans for a mixture of urban development, including commercial, industrial, residential, and other uses. The Planning Area is an area outside of Newman's jurisdictional boundaries that is included in the General Plan to provide recognition to the county and other nearby local and regional authorities, because development in these areas could have an impact on future land use in Newman.

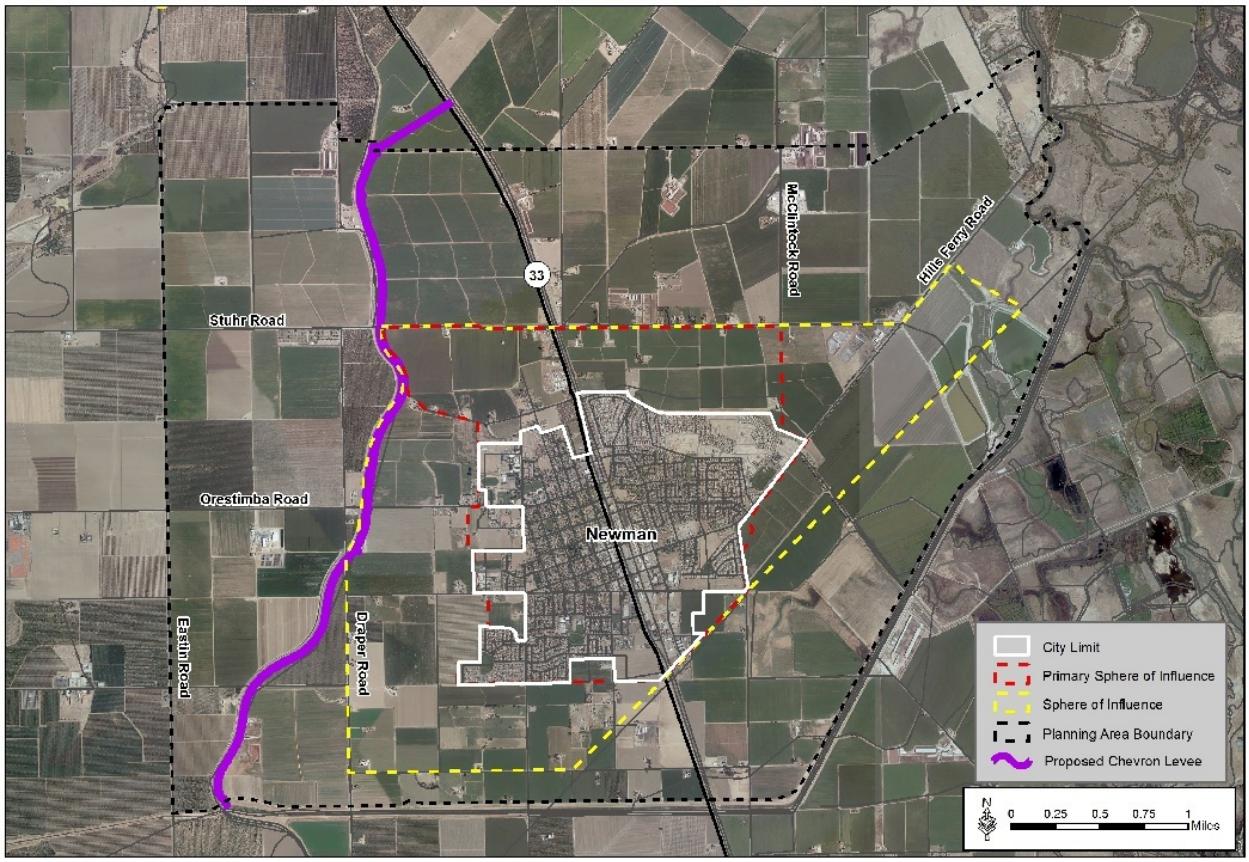


Figure 4-10: Newman Planning Boundaries

Agriculture

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments, which are much lower than normal because they are based upon farming and open space uses as opposed to full market value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971. State financial support for the Williamson Act was recently eliminated; however, Senate Bill 863 was passed in 2010 as a short-term solution for preserving the program. As of January 1, 2011, counties are allowed to establish new contracts with a reduction in terms from 10 to 9 years and a reduction of tax benefits by 10 percent. Stanislaus County holds Williamson Act Contracts with the land owners of the majority of agricultural parcels in the county (Figure 4-11). There are approximately 480 acres of lands within the Newman SOI currently held under Williamson Act contracts. Non-renewal forms have been filed for nine of these parcels, and these contracts will expire between 2012 and 2014 (Newman, 2007).

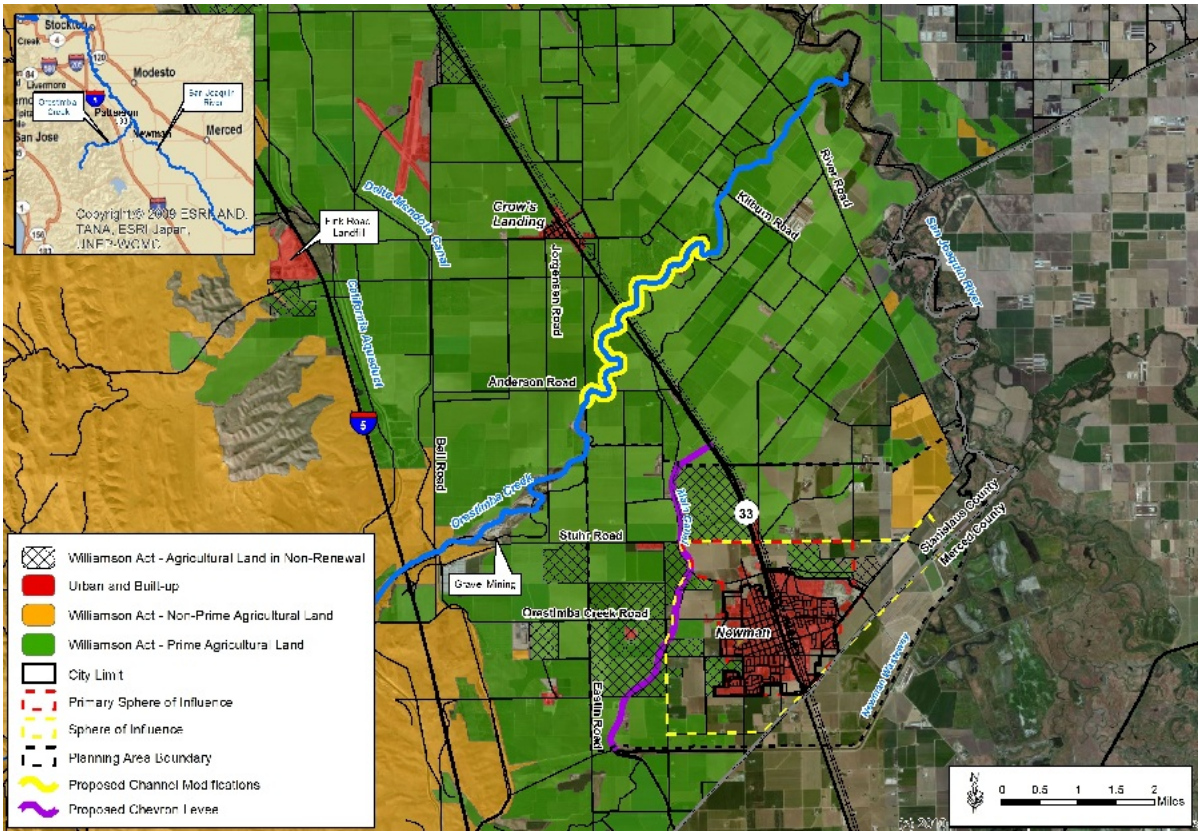


Figure 4-11. Williamson Act Contracts in the Study Area

The Stanislaus County General Plan (1994) designates lands outside of the accepted Newman SOI as agricultural and outlines a number of policies concerning its governance of land use within the county. It is the county's policy, among others, to: (1) restrict the use of lands designated as agricultural to uses that are compatible with agricultural practices, including natural resource management, open space, outdoor recreation, and enjoyment of scenic beauty; (2) protect the riparian habitat along the rivers and natural waterways to the extent possible; (3) deny all uses that intrude into or are located adjacent to an agricultural area if they are detrimental to continued agricultural usage of the surrounding area; (4) promote and protect agriculture as the primary industry of the county; (5) minimize conflict between various land uses resulting from urban expansion; and, (6) promote the diversification and growth of the local economy.

Newman has adopted a right-to-farm ordinance (Municipal Code Section 5.23.140), which recognizes that agricultural operations frequently become the subjects of nuisance complaints and seeks to reduce the premature conversion of farmland by clarifying the circumstances under which an agricultural operation may be considered a nuisance. The ordinance declares it the policy of Newman that commercial agricultural uses in the SOI, or

areas not annexed by Newman, are a priority use, and inconveniences or discomforts arising from such a use shall not be a nuisance. The ordinance also requires discretionary development approvals to require a good faith effort to coordinate with adjacent agricultural operations to reduce potential conflicts.

Newman General Plan

The Newman General Plan is a land use and development plan that is required by state law. It outlines the vision for the future and provides the regulations necessary for the community to manage the growth pressures it now faces. These regulations are designed to allow Newman to manage growth while preserving its small-town atmosphere, high quality of life, and connections to agriculture. While focused on managing growth, the Newman General Plan outlines for growth of Newman that includes the development of farmland within the SOI.

The Newman General Plan proposes land use changes to existing zoning that could result in substantial conversion of farmland to non-agricultural uses. However, existing measures in the Newman General Plan would delay, control, and minimize impacts on farmlands.

The Stanislaus Local Agency Formation Commission (LAFCO) cannot approve Newman's proposed changes to its SOI if the area includes lands under a Williamson Act contract. There are currently three properties within the proposed expansion of the SOI that are under Williamson Act contracts (Figure 4-11). These three properties are located just north of Hallowell Road and abut the southernmost boundary of the proposed SOI. Section 56426.5 of the California Code of Regulations allows LAFCO to approve a change to the SOI when the area includes land under a Williamson Act contract if certain findings can be made. One of the findings that can be made is that "the change would facilitate planned, orderly and efficient patterns of land use or provision of services, and the public interest in the change substantially outweighs the public interest in the current continuation of the contract beyond its current expiration date." Because the Newman General Plan provides for the planned, orderly, and efficient use of land, requiring the development of master plans prior to the development of most of the non-urbanized land within the proposed SOI, and because there is public interest to create a logical, clearly defined southern boundary to Newman that does not create small islands of agricultural land, LAFCO could make the finding necessary to approve the proposed expanded SOI.

The policies and actions of Newman's General Plan would result in the conversion of up to 1,729 acres of Prime Farmland, 710 acres of Unique Farmland, and 196 acres of Farmland of Local Importance to non-agricultural uses and constitute a significant impact on these valuable resources. The majority of farmlands within Newman's SOI are not located within the FEMA 100-year floodplain and development of these lands is not limited by lack of available flood insurance. As discussed below in Section 5.2.14, Williamson Act contracts existing within the proposed Newman SOI are set to expire in 2012 and 2014. Once contracts expire, these lands are likely to be developed for commercial or residential use to compensate for the substantial

increase in property taxes. Stanislaus County has designated most of the undeveloped lands within the proposed Newman SOI as agricultural lands. However, as discussed above, these lands would be zoned for development once annexed by Newman. The General Plan includes the conversion of approximately 0.67, 2.26, and 0.24 percent of the Stanislaus County Prime Farmland, Unique Farmland, and Farmland of Local Importance, respectively. Efforts to mitigate these impacts include designation of an SOI, Newman's Right-to-Farm Ordinance, and requirement of County-approved development plan prior to annexation of lands to Newman.

New development within the Newman SOI would minimize potential incompatibilities between agricultural and urban uses through the careful allocation of land uses, the layout of roads, parks, and public facilities, density controls and transfers, design guidelines for buildings and public and private improvements, and possibly the use of buffers that restrict uses adjacent to agricultural land. Newman would continue to enforce its Right-to-Farm Ordinance (municipal Code Section 5.23.140), that protects owners of agricultural land at the urban fringe from unwarranted nuisance suits brought by surrounding landowners and provides for resolution of urban-agricultural disputes. An Agricultural Mitigation Fee would be implemented as a private, market-based approach to mitigate the loss of agricultural land. The mitigation fee would be used to acquire easement or fee interest in agricultural land that restricts the use to agricultural production in perpetuity. These measures would reduce and partially offset farmland conversion impacts. Nonetheless, even with the mitigation fee, design provisions, agricultural buffer, and Right-to-Farm Ordinance included in the proposed General Plan, a substantial area of Prime Farmland would be converted to urban uses.

The proposed urban land use designations contained in the city limits and proposed SOI would in time lead to the conversion of farmland to urban uses as the Newman General Plan is implemented. The Newman General Plan designates agricultural land within the SOI and on Urban Reserve lands outside the SOI as supporting urban uses in the future. As a result of these urban designations, owners of farmland under Williamson Act contracts may be encouraged to file for non-renewal or early cancellation of their contracts in anticipation of developing their properties.

Agriculture is a significant socioeconomic driver in the study area and surrounding region, and it is important to Newman residents that new development minimizes loss of agricultural land. The Newman General Plan contains a number of policies that provide for the long-term preservation and orderly conversion of farmland within Newman's SOI and planning area.

4.2.15 Transportation

Flow of traffic and safety conditions are typically categorized according to Level of Service (LOS) on a scale from A to F. A roadway categorized as LOS A supports free-flow operations where traffic flows at or above posted speed limits and all motorists have complete mobility between lanes. A roadway categorized as LOS F represents a breakdown in vehicular flow where every vehicle moves in response to the vehicle in front of it and frequent slowing and stopping are required. A roadway functioning at LOS C represents conditions with free-flow operations and few restrictions. Planners typically establish a threshold of LOS C to provide the most efficient flow of traffic without affecting driver comfort and safety. The roadways discussed below are those which cross Orestimba Creek via either low water crossing or bridges and may be impacted by the project (Figure 4-12).

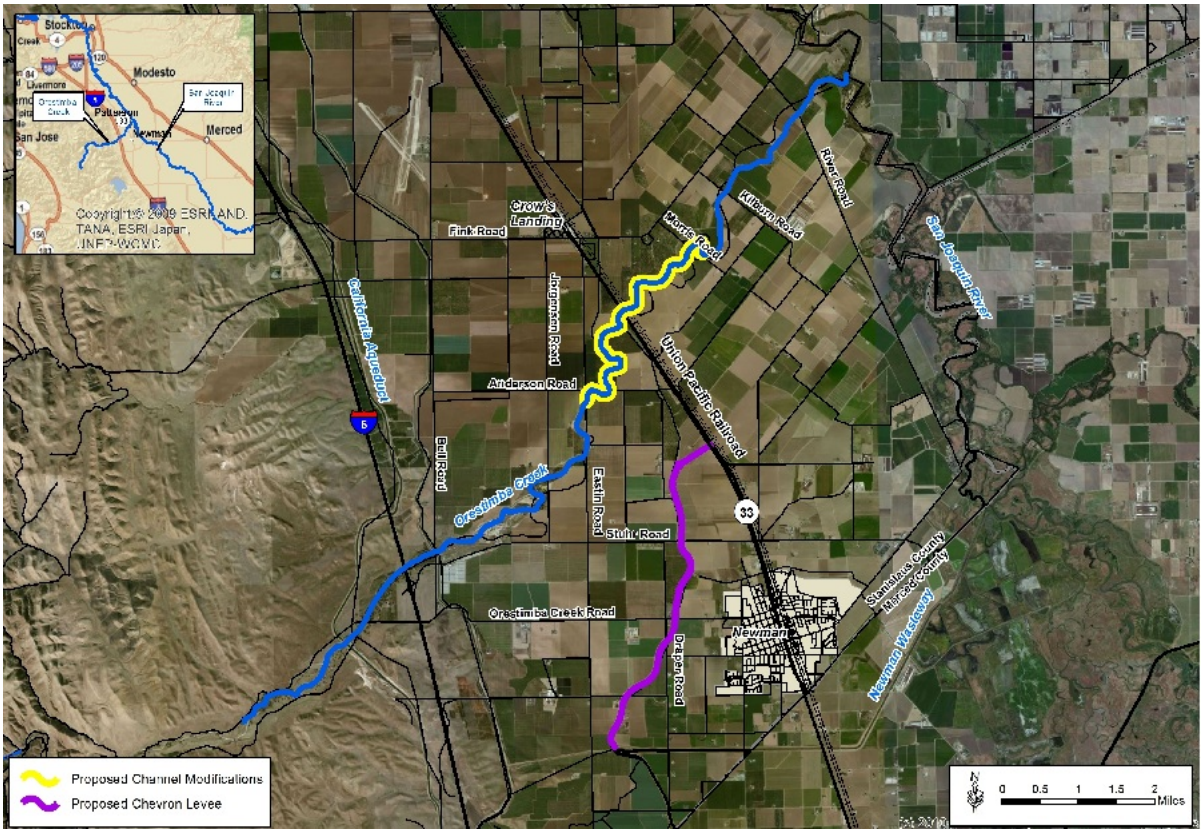


Figure 4-12: Transportation Routes

State-Maintained Highways

There is one interstate highway, I-5, and one state highway, Highway 33, that cross Stanislaus County in or near the study area.

I-5 and Highway 99

I-5 traverses Washington, Oregon, and California from north to south, connecting Vancouver, Canada to Tijuana, Mexico, and is an important corridor for both commuter and freight traffic. As I-5 enters the Central Valley from the south, it splits from Highway 99 and skirts the more remote western extremity of the valley. Highway 99 travels through the Central Valley east of the San Joaquin River and services the larger population centers of the valley, including Bakersfield and Fresno.

Highway 33

Highway 33 has a northwest-southeast alignment and generally parallels I-5 from Patterson to Gustine. Highway 33 can be accessed from I-5 via Stuhr Road. In 2008, the California Department of Transportation (Caltrans) reported average daily traffic (ADT) volumes of 6,900 and 4,600 trips, respectively, for southbound and northbound traffic on Highway 33 at Stuhr Road (Caltrans, 2009). This is somewhat less than ADT volumes in for the same segments reported in 2006 (7,200 and 4,750 trips) and for 2007 (7,300 and 4,800 trips) (Caltrans, 2009). The LOS on Highway 33 is "C or better" according to the Stanislaus County General Plan (Stanislaus County, 1994).

County-Managed Roadways

The different types of Stanislaus County-managed roadways include major, collector, and local roads (Stanislaus County, 2008). The function of a major road is to carry moderate-to-high-volume traffic to and from collectors to other major roads, expressways, and freeways with a secondary function of land access. Collectors generally serve as transition facilities, carrying traffic from lower to higher level roads but also provide access to abutting property. Local roads serve as land access facilities in the agricultural areas of the county. The LOS classifications for Stanislaus County roads that serve the rural portions of the study area are good (LOS C or better with most roads graded LOS A) (Newman, 2007). Potentially affected roads which cross Orestimba Creek or the CCID Main Canal are briefly described below.

Stuhr, Fink, and Draper Roads

Stuhr, Fink, and Draper roads are classified as major roads by Stanislaus County (Stanislaus County, 2008). Stuhr and Draper roads are classified as two-lane arterials by the City of Newman (Newman, 2007). Stuhr Road currently consists of two lanes from I-5 to Highway 33. Stanislaus County has adopted an Official Plan Line for Stuhr Road outside of Newman's Planning Boundary. Adoption of an Official Plan Line indicates possible future improvement of this road. There is no traffic signal at the intersection of Stuhr Road and

Highway 33. The Stanislaus Council of Governments assumes that Stuhr Road will be upgraded to a four-lane road by 2030 to accommodate increased growth. Because Stuhr Road is the most direct access from Newman to I-5 and because the City of Newman anticipates future growth, it is highly likely that this road will require upgrades, including additional lanes and a signal at Highway 33, to maintain its current LOS. Fink Road intersects Highway 33 approximately 6 miles north of Stuhr Road and provides access to I-5 from Crows Landing. Draper Road extends south from Stuhr Road approximately 0.5 mile west of Newman and crosses the CCID Main Canal within the proposed chevron levee alignments.

Orestimba Road

Orestimba Road is classified as a collector road by Stanislaus County (Stanislaus County, 2008) and as a two-lane arterial by Newman (Newman, 2007). Orestimba Road begins in the foothills west of I-5 and continues due east into Newman where it becomes Yolo Street. Orestimba Road crosses Orestimba Creek approximately 0.25 mile west of the California Aqueduct via a two-lane bridge.

Eastin and River Roads

Eastin Road and River Road are classified as collector roads by Stanislaus County (Stanislaus County, 2008) and are outside Newman's Planning Area. Eastin Road extends south from Highway 33 near Crows Landing and crosses Orestimba Creek via a low water crossing south of Anderson Road. River Road generally parallels the San Joaquin River and serves as a loop for Highway 33 from near Patterson to Newman. River Road crosses Orestimba Creek via a two-lane historic bridge.

Bell and Jorgenson Roads

Bell and Jorgenson roads are classified as local roads by Stanislaus County (Stanislaus County, 2008). Both roads extend south from Anderson Road and cross Orestimba Creek via low water crossings. Bell Road connects Stuhr and Fin roads east of the Delta-Mendota Canal and provides access to Anderson Road from the west.

Anderson, Morris, and Kilburn Roads

Anderson, Morris, and Kilburn roads are classified as local roads by Stanislaus County (Stanislaus County, 2008) and are between and generally parallel to Highway 33 and the San Joaquin River. Each of these roads crosses Orestimba Creek via a low water crossing.

City-Managed Roadways

Newman manages roadways within the city limits, including Highway 33. Bicycle paths are planned along Jenson Road and the Sherman Parkway from the CCID Main Canal to McClintock Road, along the CCID Main Canal, and along other roadways within Newman's SOI.

Newman has a number of designated truck routes within the city limits to allow for the safe passage of trucks.

Public Transit

The Newman area is served by Stanislaus County Transit's Westside Runabouts, which combine fixed stops and curb-to-curb service. Westside Runabouts travel along Highway 33 connecting Newman with the communities of Crows Landing and Patterson.

Railroad

CNRR operates freight service in northern California along 250 miles of leased Union Pacific Railroad's (UPRR) rail lines (UPRR, 2008). UPRR provides 54.7 miles of freight service to Stanislaus County, including a stop at Crows Landing, over a line extending from Los Banos to a connection with the UPRR at Tracy. Commodities carried include lumber, wine, beer, food products, steel pipe, agricultural products and construction material.

4.2.16 Utilities

Water Services

Groundwater is Newman's potable water source. All areas of the proposed project are underlain with groundwater, and water levels vary from 30 to 50 feet below ground surface (Newman, 2007). Groundwater wells are typically drilled to a depth of approximately 500 feet. Water quality is an area of concern due to high salinity levels; however, taste of Newman water is generally more of a concern rather than health. Currently, Newman has no treatment measures to reduce the salinity of groundwater, although several have been explored and rejected due to the special requirements for handling and disposal of byproducts that are produced in the treatment process. In order to meet future water supply needs, Newman and CCID are actively exploring the acquisition of surface water from the Delta Mendota Canal (Newman, 2007).

In 1982, most of Newman's water mains were enlarged, gridded, and connected for increased fire flow and improved water supply. New development is required to provide a looped water system to ensure greater water supply and pressure. The new water mains are required to have a minimum diameter of 8 inches for service mains and 10 and 12 inches for all distributing mains. Connection fees and fees for new construction are also levied on new development. A new well is needed for approximately every 600 units (Newman, 2007). In addition, when the water mains were replaced, new steamer-type hydrants with three hose connections replaced 276 old hydrants. The new hydrants now supply water for fire flow that is deemed satisfactory for Newman.

There are currently four wells that serve Newman. The maximum pumping capacity of all four wells combined is 6,000 gallons per minute or 8.6 million gallons per day (Newman, 2007). This capacity is sufficient to serve future expansion of the current city limits, and it is

expected that there will continue to be sufficient groundwater available to serve future growth with new wells.

Waste Water

Newman's Waste Water Treatment and Disposal Facility (WWTDF) is located 1 mile northeast of Newman on 450 acres land along Hills Ferry Road and adjacent to the San Joaquin River. The facilities provide primary and secondary waste water treatment, and the WWTDF are currently in compliance with all applicable waste water discharge and monitoring requirements (Newman, 2007).

Treated water is disposed through overland flow irrigation and flood irrigation. A total of 239 acres of agricultural land is currently irrigated and farmed by a third party contracted by Newman. The irrigation system includes a 29-acre storage reservoir, an irrigation canal, a recovery/circulation ditch, a tailwater collection pond, and a return pump station. The current irrigation acreage and storage capacity are adequate to handle flow from the proposed project. Into the future, however, it is anticipated that Newman would need an additional 406 acre-feet of storage pond in order to meet the projected 2025 waste water flows of 2.22 million gallons per day (mgd) average dry weather flow (Newman, 2007).

The WWTDF have a current operational capacity of 1.37 mgd and a permitted capacity of 1.69 mgd (Newman, 2007). It is anticipated that the projected operational capacity would be slightly exceeded with the building of all currently approved subdivisions within Newman; however, this exceedance would not cause a public health or safety issue since it is within the permitted capacity. Peak flows generally occur in the summer months due to increased inflow and infiltration of agricultural irrigation and are projected to be 1.60 mgd in the near future (Newman, 2007). The capacity of the waste water treatment plant is currently a major factor limiting growth in Newman. The City of Newman is actively working to create and approve a plan for additional waste water facilities.

Stormwater

The City of Newman is responsible for stormwater collection, drainage, and disposal and maintains and services all storm drains within the city limits. In addition to storm drains, some agricultural ditches used for irrigation supply and tailwater runoff are located within the area. These ditches are maintained by the CCID.

Drainage within the area generally flows from west to east. Storm runoff is collected in underground pipes and CCID ditches and then piped to a pump station at Inyo Avenue and Canal School Road. A main pipe along Inyo Avenue collects drainage from Newman pipe system north of Inyo Avenue. This pipe is the primary bottleneck in the current system. Newman has plans to upgrade approximately 750 to 1,000 feet of pipe to 60-inch diameter (Newman, 2007). After this upgrade, the storm drain system would be adequate to serve existing and approved new development. Currently, this pump system is operating below capacity.

The stormwater system also includes an open channel storm drain that runs from the railroad west to Hills Ferry Road along Sherman Parkway and collects runoff from the northeast areas of Newman. In the southwest portion of Newman, the CCID Clery Ditch collects stormwater from the Creekbridge subdivision, and the CCID Miller Ditch runs near Shiells Road and drains the Stephens Ranch and Canyon Creek areas. At this time, a large portion of Newman discharges into the Wasteway without water quality treatment. As the Newman population continues to approach 10,000 residents, Phase II NPDES permitting, which would likely involve the treatment and monitoring of stormwater, would be required.

Solid Waste

The Bertolotti Disposal Company serves as the waste hauler for Newman. They serve approximately 3,000 households and businesses in and around Newman (Newman, 2007). Bertolotti Disposal Company collects recycling once every 2 weeks, as well as normal household waste weekly. In 2000, approximately 49 percent of Newman's waste came from households, and 51 percent came from businesses. Newman disposed of 3,344 tons of household waste, with a residential daily disposal rate of 3 pounds per resident per day. Business waste disposal was approximately 3,480 tons, with an employee daily disposal rate of 12.7 pounds per day in 2000 (Newman, 2007). Of the 6,824 tons of non-recycled waste disposed of by Newman, 2,253 tons were taken to the Fink Road Landfill, and 4,571 tons were burned at the Covanta Stanislaus Transformation Facility (Newman, 2007).

Nearly 70 percent of the total waste received at the Fink Road Landfill is processed at the on-site waste-to-energy cogeneration plant run by Covanta Energy. The waste-to-energy plant generates approximately 30 tons of ash per day. The remaining 30 percent of waste, approximately 300 to 400 tons per day, is deposited in the landfill. The Fink Road Landfill has a permitted capacity until 2022 or 2023, depending on the type of permitted waste (such as ash) generated by the cogeneration versus municipal solid waste. In order to accommodate waste after 2023, the Fink Road Landfill is currently undergoing a permitting process with Stanislaus County to expand its site westward onto adjacent property owned by the county. A recycling center would also be included in this expansion in order to reduce the total amount of landfill waste. The Fink Road Landfill is currently permitted to accept up to 2,400 tons of waste per day (Newman, 2007).

Energy Use and Conservation

In Newman, energy conservation efforts aim to reduce electricity and private automobile use, encourage alternate energy sources, efficiently site buildings for optimal sun exposure, and implement land use and transportation policies that encourage fewer and shorter vehicle trips. Newman enforces the State (Title) 24 Building Codes on energy efficiency for all new development and also standard conditions for incorporation of solar energy conservation. Additional energy efficiency would be achieved by requiring that all new residential development meet the State Energy Star qualifications.

4.2.17 Recreation

Henry W. Coe Park (Coe Park), located 20 miles west of the study area along the headwaters of Orestimba Creek, is the largest state park in northern California, with over 87,000 acres of wild open spaces (Coe Park, 2008). The terrain of the park is rugged, varied, and beautiful, with lofty ridges and steep canyons. Within Coe Park are the headwaters of Coyote Creek, long stretches of Pacheco and Orestimba creeks, and a 23,300-acre wilderness area. The park is open year-round for hikers, mountain bikers, backpackers, equestrians, car campers, picnickers, photographers, and other visitors.

Newman provides three city parks, Harold R. Densmore, Pioneer, and Hurd Barrington parks, within its city limits (Newman, 2007). Other recreational opportunities near the study area include a community swimming pool, a youth center, and a public library. The Newman General Plan proposes to construct a bicycle path west of and parallel to the CCID Main Canal. There are no other existing or planned recreation features in or near the proposed chevron levee footprint. There is no established recreation on Orestimba Creek, and recreational access to the area above the California Aqueduct is restricted by penalty of law.

4.2.18 Aesthetics

An area's visual character is determined by the variety of the visual features present, the quality of those features, and the scope and scale of the scene. The visual components of a particular area consist of such features as landforms, vegetation, man-made structures, and land use patterns. The quality of these features depends on the relationship between them and their scale in the overall scene.

In assessing the aesthetic effects of a project, the visual sensitivity of the site must be considered. Areas of high visual sensitivity are easily visible to the general public. Scenic highways, tourist routes, and recreation areas generate sensory reactions and evaluations by the observer. The evaluations of a particular scene will vary depending on the perceptions and values of the observer. The determination of significance of potential aesthetic effects is based on the change in visual character as determined by the obstruction of a public view, creation of an aesthetically offensive public view, or adverse changes to objects having aesthetic significance.

The study area is a primarily rural environment in the southern portion of the San Joaquin Valley of central California. The area possesses a pleasant atmosphere, oriented around its agricultural heritage. Newman possesses a small town feel, with a quaint, partially rehabilitated central core. Entry corridors are important visual amenities to travelers to and from Newman, and designated gateways can greatly enhance Newman's small-town image. There are three existing or proposed gateways located on Stuhr Road at the following intersections: CCID Main Canal, Highway 33, and Hills Ferry Road.

The alluvial fan around Newman is dominated by row cropping and orchards. The Diablo Range and its foothills rising above the town provide a pleasing backdrop to the populated portion of the watershed. Both the foothills and the mature stand of Sycamore Alluvial Woodland are easily visible from the I-5 Bridge over Orestimba Creek. The mountainous headwaters are almost completely undeveloped, and provide a stark contrast to the developed portion of the watershed further downstream. The watershed possesses an aesthetic quality that appeals to people not oriented toward an urban lifestyle.

4.2.19 Noise

The area surrounding Orestimba Creek and Newman is extremely rural and the typical noise environment is relatively quiet. Agricultural and gravel mining operations, vehicle traffic on I-5 and Highway 33, and intermittent trains are the primary sources of noise levels greater than ambient conditions. Thresholds for noise exposure are normally expressed using an average daily exposure level over an extended period of time, or average day-night-level (DNL). To account for greater noise sensitivity during evening hours, nighttime noise exposure is more heavily weighted than daytime exposure in the calculation of DNL. Short-term noise levels measured over a brief period are expressed as Leq. Sound intensity is measured in decibels (dB). Because the intensity of noise does not increase linearly with increasing dB, noise levels are often expressed using the A-scale (dBA), so that a doubling of dBA represents a doubling of intensity.

The City of Newman measured ambient noise levels within the study area during development of the 2007 General Plan. To characterize the noise exposure along Highway 33, a noise measurement was taken just north of Crows Landing approximately 50 feet from the centerline of the highway. The measured noise level was approximately 72 dBA DNL. The average hourly noise level ranged from approximately 65 to 70 dBA during the daytime, and dropped to approximately 57 dBA at night. Noise measurements of approximately 70 to 74 dBA were also recorded at a location 75 feet from Stuhr Road and Highway 33 (Newman, 2007).

Currently, one freight train goes southbound through Newman to Volta and then returns back through town northbound each weekday along the UPRR line, during daytime hours. Train movements typically generate maximum noise levels of about 90 dBA at a distance of 100 feet. In locations without horn soundings, train operations generate noise levels of about 54 dBA DNL at a distance of 100 feet from the tracks. Where warning horns are used, the DNL is approximately 60 dBA at a distance of 100 feet. DNL generated by traffic along Highway 33 dominate the noise environment along the tracks at many locations.

4.2.20 Hazardous, Toxic, and Radiological Materials and Waste (HTRW)

Products as diverse as gasoline, paint solvents, film solvents, household cleaning products, refrigerants, and radioactive substances are categorized as hazardous materials. What remains of a hazardous material after use or processing is considered to be a hazardous

waste. Many of the commercial and industrial operations in Newman use hazardous materials and generate hazardous materials as part of their daily operations. Some examples of hazardous material users include gasoline stations, dry cleaners, and automotive repair shops. Additionally, hazardous materials are used by agricultural operations in the form of pesticides, herbicides, and fertilizers; and by residential households, including cleaning supplies and paints. A search of Federal, state, local, and tribal databases was conducted in 2010 (Environmental Data Resources, Inc. [EDR], 2010) for records of historical and existing hazardous material generation, handling, transport, or storage facilities within 1 mile of the construction footprint (Figure 4-13, Table 4-11). A total of 10 underground storage tanks (UST) were identified within the search radius. Each of the USTs was listed on a historic database and their current status is unknown. The contents stored within these USTs were listed as diesel or gasoline. Site #10 was identified as having violated three Federal regulations in 1998, but was in compliance as of 1999.

Table 4-11: Findings of Database Records Search for HTRW within 1 Mile of the Construction Footprint

Measure	Database	Map ID (see Figure 4-13)
Channel Modifications	Historical UST	1,2,3,4
	SWEEPS UST	1,2,4
Chevron Levee	Historical UST	6,7,8,9
	SWEEPS UST	6,9,10
	RCRA Non-Gen	10
	FINDS	10

Source: EDR, 2010

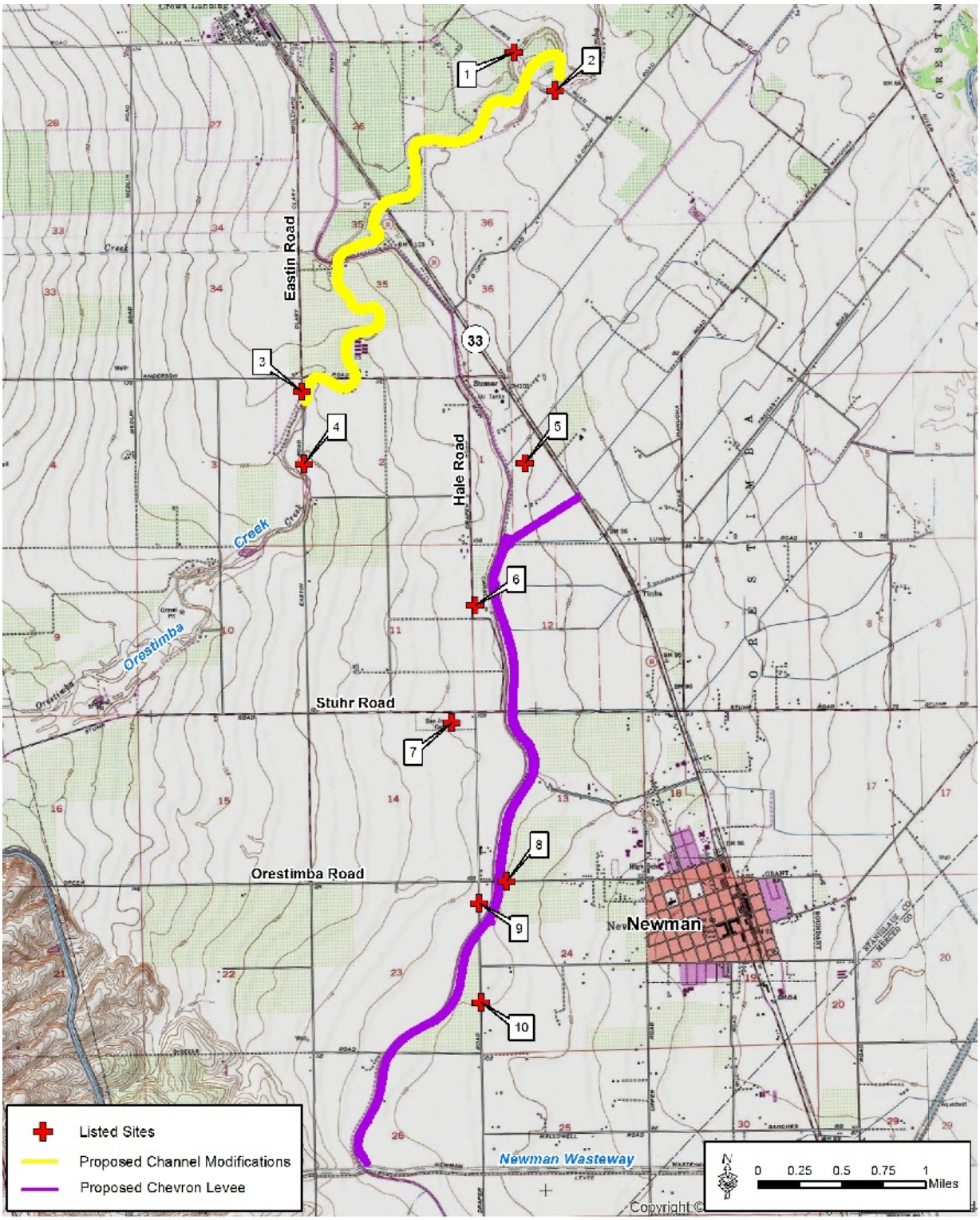


Figure 4-13: Location of Potential USTs within 1,000 feet of Project

4.2.21 Cultural Resources

Regulatory Setting

Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800) requires Federal agencies, or those they fund or permit, to consider the effects of their actions on the properties that may be eligible for listing or are listed in the National Register of Historic Places. To determine whether an undertaking could affect National Register-eligible properties, cultural resources (including archeological, historical, and traditional cultural properties) must be inventoried and evaluated for listing in the National Register prior to implementation of the undertaking.

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

The Orestimba Creek Project is subject to the stipulations of the 2012 Programmatic Agreement between USACE, the California State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation regarding implementation of the Orestimba Creek Project. The agreement requires that USACE consult with SHPO and signatories of the agreement regarding its determinations of eligibility and findings of effect once an alternative has been selected.

Cultural Setting

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

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

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

A traditional cultural property is defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history; and (b) are important in maintaining the continuing cultural identity of the community (National Park Service, 1998). Although normally associated with Native Americans, traditional cultural properties can include those that have significance derived from the role the property plays in any cultural groups' or communities' historically rooted beliefs, customs, and practices.

According to 36 CFR 800.16(l)(1), historical property is defined as "…any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

Cultural Resources in the Area of Potential Effects (APE)

A records search was conducted at Central California Information Center (CCIC) at California State University, Stanislaus in Turlock on August 15, 2008 to determine whether additional cultural resource investigations have occurred within the study area since the initial records search was conducted by USACE in 2001. It was determined that no additional archaeological investigations have been conducted within the study area since the 2001 records search. The results of the 2001 records search indicated that 10 cultural resource studies have been conducted within the study area (Table 4-12). As a result of these studies, there are 12 recorded prehistoric archaeological sites and eight recorded historic sites within the study area.

Table 4-12: Previous Cultural Resource Studies within the Study Area

CCIC #	Author/Date	USGS Quadrangle
621	Moratto *et al.* 1990	Crows Landing, Newman, Orestimba Peak
2753 a&b	Moratto *et al.* 1995	Crows Landing, Newman, Orestimba Peak
883	Napton 1980	Newman
911	Napton 1990	Newman Orestimba Peak
913	Napton 1991	Crows Landing
1715	Napton 1992	Newman
1846	Canaday, Ostrogorsky, and Hess 1992	Newman
1950	Department of Parks and Recreation 1993	Orestimba Peak
3120	Derr 1997	Newman
3265	Derr 1998	Newman

Source: CCIC records search, 2008

In September 2012, a Programmatic Agreement was agreed upon by USACE and SHPO. The Programmatic Agreement identifies specific stipulations that take into account the effects of the proposed project on cultural and historic properties. In addition to other specific requirements of the Programmatic Agreement, additional records and literature searches would be conducted prior to conducting archaeological surveys of the APE. Consultation with Native American groups and individuals to identify properties of cultural significance would be maintained and complete field surveys would be conducted prior to any construction.

Prehistoric Context

Newman is within the historic territory of the Yokuts people. Prior to European settlement, the Yokuts consisted of numerous separate tribes speaking the same language. Yokut tribes populated the San Joaquin Valley from the Sacramento-San Joaquin Delta to the current location of Bakersfield, including the foothills of the Sierra Nevada range to the east and the foothills of the Coast Range to the west. Historically, much of the study area consisted of marshlands, which supported large numbers of resident and migratory waterfowl. The Yokut likely hunted in the study area, and the potential for prehistoric resources to be scattered throughout the study area is high.

Prehistoric Resources

Existing records and previous studies indicate that 12 prehistoric sites have been identified within the study area. These sites may be determined eligible for listing on the National Register of Historic Places (NRHP) in consultation with the State Historic Preservation Officer (SHPO). Previously identified prehistoric resources include occupation sites, a signal hill or shrine, rock shelters, and several bedrock milling sites. Eligibility for listing in the NHRP has not been determined for each of the identified prehistoric resources. None of these resources occur east of the Delta-Mendota Canal.

Pursuant to the Programmatic Agreement described above, further actions would be conducted to identify and evaluate sites, assess any adverse effects, and mitigate if necessary.

Historic Context

Prior to the construction of irrigation systems, much of the marshland surrounding Orestimba Creek and the San Joaquin River remained intact, and agriculture was primarily limited to cattle ranching on the vast grasslands. Efforts to bring irrigation water to the San Joaquin Valley began in 1866 when Mr. John Bensley became involved in a corporation formed to build a new canal system connecting the Tulare Lake Basin to the San Joaquin River at the southern end of the San Joaquin Valley. From there, the canal system would extend north to Sacramento, San Joaquin Delta, San Francisco Bay, and the Pacific Ocean. At the time, Miller and Lux owned much of the water rights in the area which Bensley proposed to construct his canal system. Under the agreement entered into on May 18, 1871, Miller and Lux subsidized the newly formed canal company in exchange for a discounted price on irrigation and livestock water. This same year, the first permanent dam at the Mendota Pool was finished and impounded waters of the San Joaquin River were diverted into the headworks of the newly

constructed Main Canal. In its early years, Bensley's canal company was largely unsuccessful. Miller and Lux wrestled control away from the original investors and immediately embarked on a rapid fire campaign of canal construction. From the early 1870s through the 1920s, virtually all construction of what is now the CCID occurred. In 1937, the heirs of Miller and Lux exchanged water rights on the San Joaquin River for water to be provided by the Central Valley Project. This accord, "The Exchange Contract," remains the backbone of CCID's water supply to this day. The Central Valley Project resulted in construction of the Delta-Mendota Canal, the Friant Dam, and brought irrigation to the east side of the valley.

The Southern Pacific Westside railroad line was constructed between 1888 and 1913 and provided a rail line west of the San Joaquin River from Tracy south towards Fresno. Completion of the line had a noticeable social impact along its route and played a crucial role in the establishment of Newman. At the close of the Civil War, German-born businessman Simon Newman moved to Hills Ferry where he operated a successful mercantile business. In 1887, Mr. Newman saw an opportunity to expand his business by moving it adjacent to the rail line. He convinced others in Hills Ferry to move their businesses as well, and just one year later, the town of Newman was founded.

Historic Resources

Existing records and previous studies indicate that eight historic sites have been identified within the study area. Four of these sites are located in the Orestimba Peak quadrangle, which is entirely west of I-5, and would not be affected. These historic resources include an early concrete bridge, a sheep dip and refuse site, a historic habitation site, and a water storage site. Potentially affected resources east of I-5 include Yrenero Corona Ranch, Charles A. Hutching's grave, the railroad trestle, and the CCID Main Canal and associated irrigation features.

Yrenero Corona Ranch site CA-STA-172H (P-50-000257), was originally referenced by Latta (1977). The first historic settler on Orestimba Creek, Yrenero Corona, settled the area in 1859. The ranch house is no longer standing. During interviews with local residents, Napton (1980) reports of "…finding bottles and other historic refuse near the former house site." Charles A. Hutching's grave and other unmarked graves site CA-STA-177H (P-50-000257) are located near Corona Ranch. Mr. Hutchings (1790 – 1871) was a clerk of the first school on the west side of the county, a private institution. Mr. Hutchings, his wife, and possibly Yrenero Corona's daughter are buried at the site. There is one standing grave marker at the location with a small white wooden fence enclosing the site (Napton, 1980). During the August 2008 record search at the CCIC, it was noted that no additional investigations have been conducted at these sites, and no NRHP eligibility recommendations have been made.

The CCID Main Canal (P-50-0000065) (also known as the San Joaquin and Kings River Canal) is part of a valley-wide water distribution system constructed in the 1870s. Early irrigation in the San Joaquin Valley encompassed low-lying areas adjoining the San Joaquin River south of Stockton. In the late 1860s, much of this riparian land was controlled by the partnership of Henry Miller & Charles Lux and Bank of California President William Ralston.

Together, these three formed the San Joaquin and Kings River Canal Irrigation Company. In the 1870s, the company proposed a valley-wide system of water distribution; the CCID Main Canal is a product of this system. Construction began on the San Joaquin and Kings River Canal in 1871. The construction date of the section of the CCID Main Canal that is part of the area of potential effects is unknown, although it appears on a 1939 soils map and the 1908 USGS Panoche Quadrangle as the "San Joaquin and Kings River Canal."

Southern Pacific Westside Railroad site CA-STA-350H (P-50-000001) is the UPRR Line now operated by CNRR, but was formerly owned and operated by the San Pablo & Tulare Extension Railway Company (Fickeworth, 1992). The San Pablo & Tulare Railroad line was incorporated by the Southern Pacific Railroad on February 7, 1887. No site records have been reported within the area of potential effects, but this line has been designated the same trinomial as the San Joaquin Valley Main Line (CA-STA-350H [P-50-000001]) elsewhere in Stanislaus County. UPRR has replaced or refurbished most of the bridges and trestles currently in use today, and the trestle within the study area is not likely to be a historic feature. Although the line itself is designated as a historic site, the modern trestle does not contribute to the historic character of the line.

Pursuant to the Programmatic Agreement described above, further actions would be conducted to identify and evaluate sites, assess any adverse effects, and mitigate if necessary.

CHAPTER 5 – EFFECTS ASSESSMENT*

5.1 INTRODUCTION

This chapter assesses the effects of the proposed alternatives on the affected environment described in Chapter 4. This assessment will be used to determine whether the proposed action would result in significant adverse effects on the environment, thus requiring the preparation of an Environmental Impact Statement and/or Environmental Impact Report, or whether the types and significance of effects of the proposed action would support a Finding of No Significant Impact and/or Mitigated Negative Declaration. When necessary, mitigation measures are provided to avoid or reduced potential adverse effects to a less than significant level. This chapter is organized to meet CEQA requirements for an impact-by-impact determination of effect, but will also be used to determine the overall effect of each alternative, as required by NEPA. Significance thresholds used in this assessment are derived from the Newman General Plan of 2007, the Stanislaus County General Plan of 2008, CEQA Guidelines (CERES 2007), and State and Federal regulations and policies.

5.2 EFFECTS DETERMINATION

5.2.1 Seismicity

Implementation of a project alternative would result in a significant seismic impact if it would expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
- Strong seismic ground shaking; or
- Seismic-related ground failure, including liquefaction, landslides, mudslides, or other similar hazards.

Alternative 1: No Action

Newman and surrounding areas are located in an area of low seismic risk. The nearest Alquist-Priolo Earthquake Fault Zone is located west of the Delta-Mendota Canal near the foothills of the Diablo Range. Development of lands within this zone is limited by Stanislaus County policies and regulations, as well as rugged terrain and lack of infrastructure. The San Joaquin Fault underlies the Orestimba Creek watershed and the southwest corner of Newman's SOI. Newman requires new development and substantial renovations to comply with current seismic standards for construction and requires geotechnical engineering studies for major new buildings or earthworks. The No Action Alternative would not result in development within

areas of high seismic risk or expose people or structures to adverse effects of seismic activity. The No Action Alternative would not result in significant adverse effects due to seismic conditions.

Alternative 2: Chevron Levee (NED)

Alternative 2 could result in significant indirect effects, but these would be mitigated to less than significant through proper levee design and construction. The proposed chevron levee would not be located in the Alquist-Priolo Special Study Zone; however, the San Joaquin Fault underlies the proposed chevron levee alignment and the CCID Main Canal near the Newman Wasteway. Alternative 2 would not directly expose people to adverse effects of seismic activity. No people or structures would be located within the levee footprint, and none would be at risk of damage from seismic-related levee damage.

The location of the proposed chevron levee over a known fault would indirectly expose people and structures to potential adverse effects if seismic-related levee failure occurred during a flood event. When properly designed and constructed, earthen levees are resistant to strong seismic shaking. Seismic damage to earthen levees is typically limited to minimal shifting or settling of earthen materials. Although shifting or settling of the levee materials could result in overtopping of the levee, levee failure is highly unlikely to occur. Thus, seismic damage to the levee could result in increased flood damage on the protected side of the levee. Increased flood damage would be proportional to the seismic damage occurring and would not substantially affect the extent, depth, or duration of flooding occurring under design conditions.

To ensure long-term stability of the levee, a geotechnical study would be completed during the preconstruction engineering and design (PED) phase, and levees would be constructed following State of California and USACE guidelines for levee construction. With a geotechnical study and implementation of appropriate design measures, the potential indirect impacts of seismic activity would be less than significant.

Mitigation

Impacts on seismicity would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

Implementation of Alternative 3 would have less than significant impacts similar to Alternative 3.

Mitigation

Impacts on seismicity would be less than significant and no mitigation is required.

5.2.2 Geology

Implementation of a project alternative would have a significant geologic effect if it would:

- Substantially alter natural geologic processes resulting in hazardous conditions;
- 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 an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse; or
- 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.

Alternative 1: No Action

Under the No Action Alternative, the geologic processes associated with flooding of Orestimba Creek would be minimally impacted. Gravel mining and the construction of levees, berms, and bridges have altered the patterns of sediment deposition on the alluvial fan and in the channel. Additionally, these factors have affected the patterns of channel scouring. These actions have largely had local effects on geologic processes. Flooding and the associated depositional process still occur throughout much of the historic alluvial fan. Flood waters upstream of the trestle overtop both the CCID Main Canal berms and the railroad track berm at multiple locations where flood flows typically follow east-west roads to the San Joaquin River. The metering of flows past the UPRR trestle has scoured the main channel of Orestimba Creek, which is expected to maintain its current capacity. Hazardous conditions arise during flood events; however, these conditions are largely the result of natural patterns of flooding, and geologic process would remain minimally impacted.

Because the study area is generally flat, the potentials for landslides, lateral spreading, and collapse of geologic features are low. The groundwater table can be near the surface throughout the study area, and these areas are subject to liquefaction. Due to the high expansion potential of most soils, local subsidence is common. To minimize the potential for hazardous conditions, Newman requires new development and substantial renovations to comply with current seismic standards for construction and requires geotechnical engineering studies for major new buildings or earthworks. Construction grade aggregate deposits occur throughout the study area and are currently being mined on Orestimba Creek. Mineral resources would remain available for mining. The No Action alternative would result in less than significant effects on geologic processes and resources of the study area.

Alternative 2: Chevron Levee (NED)

Implementation of Alternative 2 would alter the pattern of geologic processes, but would not substantially affect hazardous conditions occurring as a result of deposition and erosion. Under Alternative 2, deposition on the floodplain would be located upstream of the chevron levee and would be reduced in frequency. It is anticipated that channel capacity would continue to be maintained through the natural processes of deposition and scouring. The potential for in-stream deposition or scouring of the channel to cause substantial hazardous conditions would remain minimal.

The chevron levees would be located on expansive soils and could be located in areas where the groundwater table is high. Subsidence or liquefaction of soils underlying the chevron levee could result in hazardous conditions and would be a significant geological impact, but would be mitigated to less than significant as described below.

High quality aggregate is found in the subsurface materials throughout the Orestimba Creek basin. Construction of chevron levees would not remove or affect the availability of these mineral resources.

Mitigation

To ensure long-term stability of the levee, a geotechnical study would be completed during the PED phase, and levees would be constructed following State of California and USACE guidelines for levee construction. With a geotechnical study and implementation of appropriate design measures, based on the study results, the potentially significant impacts resulting from underlying geologic conditions would be less than significant.

Alternative 3: Chevron Levee with Freeboard (LPP)

Alternative 3 would affect geologic processes similar to Alternative 2. Subsidence or liquefaction of soils underlying the chevron levee could result in hazardous conditions and would be a significant geological impact, but would be mitigated to less than significant as described below. High quality aggregates found in the basin would not be affected.

Mitigation

A geotechnical study and implementation of State and USACE construction guidelines would be required to reduce impacts to less than significant.

5.2.3 Soils

Implementation of a project alternative would have a significant impact on soils if it would result in substantial soil erosion or the loss of topsoil.

Alternative 1: No Action

Due to the limited topography and depth of flooding on the alluvial plain, erosion processes are minimal. City and County regulations control soil erosion resulting from development, and the long-term potential for loss of top soil is discountable. The impact would be less than significant.

Alternative 2: Chevron Levee (NED)

The study area is generally flat, and the long-term potential for substantial erosion of soils to occur is minimal. The construction footprint of the NED levee, including the levee footprint, staging areas, haul routes, and a 20-foot buffer within the construction right-of-way would total less than 152 acres. Due to the large area of soils that would be temporarily exposed during construction, the short-term potential for erosion to occur would be significant but would be mitigated to less than significant as described below. Long-term soil erosion would be avoided through appropriate design measures as described below.

Mitigation

A Storm Water Pollution Prevention Plan (SWPPP) incorporating site-specific measures to reduce erosion would be developed by the contractor prior to construction, and erosion protection measures would be monitored to ensure that soil loss is less than significant. Compliance with the conditions of an encroachment permit from the San Joaquin Valley Flood Control District would further reduce the potential for substantial erosion to occur. The potential for substantial erosion to occur as a result of chevron levee construction would be less than significant.

Alternative 3: Chevron Levee with Freeboard (LPP)

Construction of the chevron levee would disturb approximately 152 acres of soils. Due to the large area of soils that would be temporarily exposed during construction, the short-term potential for erosion to occur would be a significant impact, but would be mitigated to less than significant as described below.

Mitigation

A SWPPP would be developed prior to construction to ensure that soil erosion is less than significant, and compliance with the conditions of an SJVFCD encroachment permit would further reduce the potential for substantial erosion to occur.

5.2.4 Hydrology

Implementation of a project alternative would have a significant hydrologic impact if it would expose people or structures to a substantial risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or if it would

substantially alter the existing drainage pattern of the site or area in a manner which would result in substantial erosion, siltation, or increased flooding on- or off-site.

Alternative 1: No Action

Under the No Action Alternative, the significant risk of property loss, injury, and death involving flooding would continue. Flood frequency and the extent of flooding across the alluvial plain are primarily the result of natural processes and the general lack of control structures on Orestimba Creek. Limited channel capacity and channel restrictions in the middle reach contribute to flooding in Newman and can result in property loss, injury, and potentially death. Under Newman's General Plan, development within the next 10 years would primarily occur south of Stuhr Road within Newman's proposed primary SOI. This area is affected by the 1/100 ACE; however, Newman regulations require measures to reduce the impacts of flooding to less than significant. Small-scale flood risk reduction measures could be implemented by local interests in the middle reach to reduce flood risk within the primary SOI; however, these measures are likely to have very local effects. The overall risk of property loss, injury, or death involving flooding would remain significant.

Alternative 2: Chevron Levee (NED)

Alternative 2 would have beneficial effects on hydrology. Alternative 2 would reduce the risk of property loss, injury, and death involving flooding. The potential for levee failure would be discountable. Through project design, adverse erosion and siltation would be avoided.

The proposed chevron levee would substantially reduce flood risks on developed lands along the Highway 33 corridor, on undeveloped lands north and south of Stuhr Road, and on lands east of the railroad tracks. Currently, flooding in these areas is generally between 0.1 and 0.5 feet in depth and results in substantial risk of property loss, injury, and death. Approximately 40 percent of the land within Newman's SOI is currently subject to shallow flooding. With construction of the proposed chevron levee, flood flows overtopping the CCID Main Canal berm would be intercepted and directed away from developed areas.

Alternative 2 would likely result in short-term increased depths in some areas east of the railroad tracks that are already subject to flooding. The depth of the potential increases during peak flows, which are projected to recede within 24 hours, would vary under each flood event scenario based on the existing topography. The range of depths under each frequency scenario is generally similar under both existing and with project conditions. The main difference would likely be during the 1/10 AEP, where depths in some places could increase by 0.5 feet.

Agriculture (row crops) is the primary land use within the area with the potential for increased flooding. Four residences are also located in the area. A windshield survey determined that each residence is on a raised foundation with several steps required to reach

the first floor elevation. In addition, the structures are located on raised building sites, putting the first floor elevation well above the modeled potential depths.

Implementation of the project would involve tying the new levee into the bed of the railroad to prevent the existing channeling of low flows into Newman. As a result, flood flows may top the railroad during more frequent events than under existing conditions. The tie-in would be designed to prevent through seepage and provide erosion protection for the railroad bed.

The overall impact of the Alternative 2 would be beneficial.

Mitigation

Impacts on hydrology would be beneficial and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

The impacts of Alternative 3 would be similar to those occurring as a result of Alternative 2. The increased height of the chevron levee proposed under Alternative 3 would result in a greater reduction of flood damage risk in developed areas of Newman and a greater overall beneficial impact.

Mitigation

Impacts on hydrology would be beneficial and no mitigation is required.

5.2.5 Water Quality

Implementation of a project alternative would have a significant impact on water quality if it would violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality; or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of non-point source polluted runoff.

Alternative 1: No Action

Flooding of agricultural and urban lands results in pollution of both Orestimba Creek and the San Joaquin River and contributes to water quality which is not in attainment of designated uses. Flood flows which inundate agricultural fields are exposed to agricultural pesticides and nutrients, and flood flows in urban areas are exposed to petroleum products, solvents, pesticides, nutrients, and other pollutants. Polluted flood flows either return to Orestimba Creek via overland flow or are collected by agricultural and stormwater drainage systems and discharged to the San Joaquin River. Irrigation return waters, which can also contain pollutants, are collected by agricultural drains managed by the CCID or by Orestimba Creek and are

discharged into the San Joaquin River. Measures to reuse irrigation waters reduce these impacts; however, they remain significant.

In addition to Newman-maintained storm drains within the city limits, CCID-maintained agricultural ditches that supply and collect water runoff are located within Newman's SOI. Some city storm drains collect CCID water. Stormwater runoff is collected in underground pipes and CCID ditches and flows to a pump station at Inyo Avenue and Canal School Road. There are five lift stations to pump stormwater which currently operate below capacity. Under current conditions, large storm events result in the collection of overland flood flows by the Newman Wasteway. Water quality is an issue because the population of Newman is growing quickly and because a large portion of Newman discharges runoff into the Newman Wasteway without water quality treatment. Additional development and related construction activities allowed by the proposed General Plan could affect the drainage system in the Newman area with increased runoff, resulting in the need for more drainage capacity and additional permitting requirements. Increased capacity and treatment measures would reduce the existing significant impacts.

Alternative 2: Chevron Levee (NED)

During the construction of the proposed chevron levee, approximately 152 acres of bare soil would be exposed until construction is completed. In addition, inadvertent spills of oil or fuels from construction equipment could be a source of contamination at work or staging areas. These short-term effects would be mitigated as described below.

Once the construction is completed and the levee slopes and staging areas are reseeded, the long term effects of a chevron levee would be primarily beneficial. The chevron levee would restrict flood flows from entering urban areas. The potential for contamination of flood flows by both agricultural pollutants and pollutants associated with developed areas would be substantially reduced. Reduction in frequency and volume of polluted discharge and reduction in exposure to pollutants would result in a net improvement to water quality in both Orestimba Creek and the San Joaquin River, and long-term water quality would be beneficially affected.

Flood flows would ultimately be discharged to the San Joaquin River via Orestimba Creek, agricultural drains, or the Newman Wasteway. During smaller events, most overland flood flows would return to Orestimba Creek prior to discharge into the San Joaquin River. During moderate events, flood flows could overtop the UPRR embankment and be collected by agricultural drains prior to discharge into the San Joaquin River. The capacity of agricultural drains is not likely to be sufficient to contain these flows, and these flows would be exposed to agricultural pollutants; however, flows would be reduced in comparison to existing conditions. With the implementation of Alternative 2, the volume and frequency of flood flows entering the Newman Wasteway would be substantially reduced. Alternative 2 would substantially reduce flood flows within Newman's proposed SOI and would have a beneficial effect on existing stormwater drainage systems.

Mitigation

Mitigation measures would include obtaining an NPDES general construction permit from CVRWQCB and the development of a SWPPP. The SWPPP would identify best management practices that would avoid or minimize any adverse effects during construction. Once construction is completed, the levee slopes and staging areas would be reseeded in a timely manner to control erosion.

The implementation of these mitigation measures would reduce impacts to water quality to less than significant.

Alternative 3: Chevron Levee with Freeboard (LPP)

The impacts of Alternative 3 would be similar to those occurring as a result of Alternative 2. Mitigation measures would reduce impacts to less than significant. Similar to Alternative 2, Alternative 3 would increase the area of flood risk reduction, thereby reducing the exposure of overland flood flows to agricultural pollutants and beneficially impacting water quality.

Mitigation

The implementation of a SWPPP as described in Alternative 2 would reduce impacts to water quality to less than significant.

5.2.6 Groundwater

A project alternative would significantly impact groundwater if it would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (if the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

Alternative 1: No Action

Development within Newman and surrounding areas could reduce recharge rates as the area of impervious surfaces increases and a larger volume of surface flows are collected by surface drains. According to Newman, there is sufficient groundwater within the proposed SOI and the surrounding area to meet both the needs of the existing population, as well as growth anticipated in the Newman General Plan, without depleting the groundwater aquifer. The No Action Alternative would have a less than significant impact on groundwater availability.

Alternative 2: Chevron Levee (NED)

Construction of chevron levees would minimize the area of flooding and reduce the area over which recharge occurs on the floodplain; however, as illustrated by the high water table in the Newman SOI and Newman's need to reduce water levels by providing and maintaining agricultural irrigation drainage systems, the future growth anticipated by the proposed General Plan would not substantially deplete groundwater supplies even if Newman continues to rely on groundwater as its primary source of water in the future. Alternative 2 would have a less than significant impact on groundwater recharge.

Mitigation

Impacts on groundwater would be less than significant, and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

The impacts of Alternative 3 on flooding would be similar to those occurring under Alternative 2.

Mitigation

Impacts on groundwater would be less than significant, and no mitigation is required.

5.2.7 Waters of the U.S. and Wetlands

A project alternative would have a significant impact on waters of the U.S., including wetlands, if it would have a substantial adverse effect on Federally protected waters of the U.S. through direct removal, filling, hydrological interruption, or other means.

Alternative 1: No Action

As discussed in Section 4.2.7, a delineation of wetlands and Waters of the U.S. identified four potential jurisdictional wetlands in the upper reach of the study area. These areas would not likely be impacted as a result of anticipated growth in Newman and surrounding areas. The No Action Alternative would result in less than significant impacts on these wetlands.

Alternative 2: Chevron Levees (NED)

As discussed in Section 4.2.7, a delineation of wetlands and Waters of the U.S. did not identify jurisdictional wetlands within the project footprint as defined by the proposed chevron levee. Formal wetland delineation conducted prior to construction would determine if there are jurisdictional wetlands not identified by the NWI maps.

Mitigation

Impacts on Waters of the U.S. and wetlands would be less than significant, and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

Alternative 3 would impact the same areas as described under Alternative 2. Impacts would be mitigated to less than significant as described under Alternative 2.

Mitigation

Impacts on Waters of the U.S. and wetlands would be less than significant, and no mitigation is required.

5.2.8 Air Quality

Implementation of a project alternative would have a significant air quality impact if it would:

- Directly or indirectly result in a substantial increase of air pollutants in areas in non-attainment of State or Federal air standards;
- Conflict with or obstruct implementation of the Valley Air District Air Quality Control Plan;
- Conflict with the Newman or Stanislaus County General Plan guidelines for control of air pollution;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation; or
- Expose sensitive receptors to substantial pollutant concentrations.

Alternative 1: No Action

The San Joaquin Valley Airshed is currently in non-attainment of State and Federal air quality standards for 8-hour O_3 and $PM_{2.5}$. The Valley Air District has developed air pollution control measures under three California Air Resources Board (CARB)-approved Air Quality Control Plans: the Extreme Ozone Attainment Demonstration Plan, the Carbon Monoxide Maintenance Plan, and a PM_{10} Maintenance Plan. Ozone control measures focus on eliminating precursors and placing restrictions on a wide range of emission sources. These emission sources include oil and gas producers and refineries, school bus fleets, residential development projects generating increased traffic, commercial fuel combustion, wineries, agricultural dryers, and numerous other sources. The control measures for carbon monoxide (CO) are based on reformulation of gasoline, exhaust emission standards, and use of low-emission vehicles.

Control measures for PM_{10} are similar to those implemented for carbon monoxide, and extend emission standards to larger vehicles such as trucks and buses. A $PM_{2.5}$ Plan was submitted to CARB in 2008 and is still under development. The $PM_{2.5}$ Plan demonstrates the effectiveness of control measures adopted under previous plans, and anticipates attainment of $PM_{2.5}$ air quality standards by 2012. Newman and Stanislaus County have adopted policies and regulations to improve air quality conditions in the San Joaquin Valley Airshed. These policies and regulations:

- Endorse implementation of mixed-use land uses that promote alternative modes of transportation;
- Call for a reduction of air pollution associated with energy usage;
- Encourage compliance with Federal and State air quality standards;
- Enact expansion of employment opportunities to reduce commuting times and increase ridesharing and transit use;
- Require installation of cleaner, gas-burning fireplaces in new developments;
- Encourage construction of bicycle, pedestrian and transit facilities;
- Require features in new developments to reduce reliance of gas-powered landscape equipment;
- Regulate emissions from residential fireplaces and wood-burning heaters and provide educational information to reduce wood smoke emissions; and
- Enact measures to reduce ambient concentrations of PM_{10} by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions.

Despite these measures, the Newman General Plan would exceed transportation assumptions required to meet attainment under the current plans. Due to increases in vehicle use beyond those anticipated in the Air Quality Control Plan, the No Action Alternative would have a significant impact on air quality.

Alternative 2: Chevron Levees (NED)

The material required for construction of the levee would be obtained from the Fink Road Landfill, an existing regional landfill operated by Stanislaus County. The Fink Road landfill is located about 12 miles from the proposed construction site. This borrow source for the material has been the assumed location for calculating air quality emissions. Emissions resulting from implementation of Alternative 2 would be less than those occurring under Alternative 3 due to the smaller size of the NED levee. As discussed below, the effects of Alternative 3 would be less than significant; thus, the effects of Alternative 2 would also be less than significant.

Mitigation

In compliance with Valley Air District control measures, all construction equipment would meet current exhaust emission standards. In compliance with City of Newman and Stanislaus County guidelines, measures to reduce anthropogenic emissions of PM_{10} would include minimization of the construction footprint and wetting of soils when beneficial for the suppression of windborne dust. To further reduce air emissions resulting from the transport of materials, suitable excavated materials would be used in the construction of levees or would be spread on adjacent agricultural fields. With these and other Best Management Practices in place, effects on Air Quality would be mitigated to less than significant.

Alternative 3: Chevron Levee with Freeboard (LPP)

Emissions resulting from implementation of Alternative 3 would not exceed Federal and State *de minimis* thresholds, and a conformity determination would not be required (Table 5-1 and Appendix D). Due to the greater number of dump truck trips required for construction of the larger chevron levee, this alternative would have the greatest annual impact on air quality. Impacts to air quality would be short-term and limited to the construction period. The use of dump trucks with a minimum load capacity of 16 cubic yards for transport of levee construction materials is necessary to meet conformity requirements. Direct and indirect impacts on air quality would be less than significant. All applicable Valley Air District control measures and local guidelines for controlling emissions would be implemented. There are no sensitive receptors, such as schools, near the construction footprint and construction activities would not result in high concentrations of pollutants. Alternative 3 would result in less than significant impacts on air quality.

Table 5-1: Construction Emissions for Alternative 3

Construction Activity	Construction Emissions for Criteria Pollutants and GHG (tons per year)						
	VOC	CO	NO_x	PM-10	PM-2.5	SO_2	CO_2
Levee Construction	3.45	15.99	38.86	42.95	5.89	2.78	15,101
de minimis Thresholds	50.00	NA	50.00	50.00	100.00	NA	27,557

Mitigation

In compliance with Valley Air District control measures, all construction equipment would meet current exhaust emission standards. In compliance with City of Newman and Stanislaus County guidelines, measures to reduce anthropogenic emissions of PM_{10} would include minimization of the construction footprint and wetting of soils when beneficial for the suppression of windborne dust. To further reduce air emissions resulting from the transport of materials, suitable excavated materials would be used in the construction of levees or would be

spread on adjacent agricultural fields. With these and other best management practices in place, effects on air quality would be mitigated to less than significant.

5.2.9 Vegetation

Implementation of a project alternative would result in significant impacts on vegetation if it would have a substantial adverse effect on any riparian habitat or other sensitive natural community type identified by CDFG.

Alternative 1: No Action

Growth of Newman and surrounding areas could result in impacts on agricultural fields and riparian areas of Orestimba Creek and the San Joaquin River. Although grazing lands are dominated by non-native annual grasses, some native species are likely to occur in these areas. Other agricultural fields support native and non-native species around their margins. The loss of common native plants would not be substantial due to the prevalence of similar communities throughout the Central Valley. Much of the riparian habitat within the study area has been removed or substantially degraded by past agricultural and urban development. The removal or degradation of remaining patches of riparian habitat could occur as a result of local efforts to control the hydrology of Orestimba Creek. Due to the limited area of remaining riparian habitat, even a modest loss or degradation as a result of future growth would be a significant impact on this sensitive natural community. However, local agencies would be required to receive a Streambed Alteration Agreement from CDFG for any work to the Orestimba Creek bed and banks, and implement mitigation measures for loss of riparian habitat as part of the permit activity. The impact would be less than significant.

Alternative 2: Chevron Levee (NED)

The construction footprint of the NED levee, including the levee footprint, staging areas, haul routes, and a 20-foot buffer within the construction right-of-way would total less than 152 acres. During construction, approximately 152 acres of agricultural land would be temporarily or permanently impacted. None of these lands are used for grazing and none would be considered a natural community. There would therefore not be any adverse effect on any riparian habitat or other sensitive natural community type. The Coordination Act Report provided by the USFWS recommends implementation of the project as proposed without any need for compensatory mitigation (USFWS, 2012). The impact would be less than significant.

Mitigation

No mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

The construction of a chevron levee would result in impacts similar to those described under Alternative 2. The impact would be less than significant.

Mitigation

No mitigation is required.

5.2.10 Wildlife and Fisheries

Implementation of a project alternative would have a significant impact on wildlife and fisheries if it would result in a substantial loss of habitat such that displacement of individuals threatens the long-term persistence of local populations; or have a substantial interference with the movement of any native resident or migratory fish or wildlife species, their wildlife corridors, or nursery sites.

Alternative 1: No Action

Wildlife habitats would be impacted by the No Action Alternative. Anticipated growth under the General Plan would result in loss of alfalfa fields and grazing lands, which provide habitat for insects and small mammals. These areas also provide foraging habitat for raptors nesting in woodland habitat along Orestimba Creek and the San Joaquin River. However, the area of similar habitat within foraging distance of suitable nesting habitats is extensive, and the number of raptors that forage in agricultural fields surrounding Orestimba Creek is likely limited by nesting habitat availability rather than forage. Newman policies would serve to adequately protect existing trees and other important vegetation resources in Newman's SOI, as well as provide additional plantings as part of new development and public improvements. With measures to avoid, minimize, and mitigate for potential impacts, future development would have a less than significant impact on wildlife and wildlife habitats.

As described under water quality, flooding would continue under the No Action Alternative. Under current conditions, flooding contributes to the discharge of agricultural and urban pollutants into Orestimba Creek and the San Joaquin River. This source of pollution is minimal in relation to stormwater run-off discharged through agricultural drains during storm events of lower intensity and as a result of irrigation returns. Measures to improve existing drainage facilities and measures included in NPDES permit requirements would reduce impacts on water quality, and subsequently fishes and other aquatic organisms, to less than significant.

Alternative 2: Chevron Levee (NED)

Construction of the chevron levee would result in the temporary loss and degradation of less than 152 acres of wildlife habitat associated with agricultural margins. Following construction, the grass-covered levee and relocated agricultural margins would provide habitats of similar quality. The temporary loss of these habitats would have minimal impact on

wildlife populations due to the prevalence of equally suitable habitats nearby. Due to the proximity of the proposed chevron levee to urbanized areas and its distance from the foothills, construction-related disturbance is not likely to affect wildlife migration patterns. Potential for displacement of burrowing owls is discussed below in section 5.2.11, Special Status Species. Construction-related impacts on water quality would have short-term and less than significant impacts on local fish populations.

Mitigation

Upon completion of construction, the levee slopes would be hydroseeded with native grasses. All water quality impacts would be mitigated as described in Section 5.2.5, Water Quality. Mitigation measures would include an NPDES general construction permit from CVRWQCB and the development of a SWPPP.

Alternative 3: Chevron Levee with Freeboard (LPP)

Impacts on wildlife and fisheries would be minimal and similar to those resulting from Alternative 2. Alternative 3 would result in the temporary loss or degradation of approximately 152 acres of habitats associated with agricultural margins during construction. Similar to Alternative 2, these impacts would be minimal, and the chevron levee would provide long-term replacement habitat of similar quality.

Mitigation

Through avoidance of riparian plant communities, as described under Alternative 2, impacts would be mitigated to less than significant.

5.2.11 Special-Status Species

Implementation of a project alternative would significantly impact special-status species if it would:

- Harm or harass a special-status plant or animal;
- Directly or indirectly affect essential habitat of special-status species; or
- Prevent the migration of a special-status species between potentially occupied habitats.

Alternative 1: No Action

Potential habitat for eight special-status species occurs within Newman's SOI: the Valley Elderberry Longhorn Beetle (*Desmoceros californicus* dimorphus) (VELB), the San Joaquin Kit Fox (*Vulpes macroitis mutica*), Tricolored blackbird (*Agelaius tricolor*), Western burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsonii*), Mountain plover (*Charadrius montanus*), California Horned Lark (*Eremophila alpestris*), and Loggerhead shrike (*Lanius*

ludovicianus). Newman and Stanislaus County regulations and policies require pre-construction surveys of projects located in potentially suitable habitats for special-status species, and mitigation of any habitat loss. With mitigation, impacts from future growth and development to special-status species would be less than significant.

Alternative 2: Chevron Levee (NED)

Construction of the levee improvements could result in direct and indirect effects to the VELB, San Joaquin kit fox, tricolored blackbird, Western burrowing owl, Swainson's hawk, mountain plover, California horned lark and loggerhead shrike.

There would be no direct effects to the VELB due to removal or damage to elderberry shrubs during site preparation and construction activities. Indirect effects could include physical vibration and an increase in dust during operation of equipment and trucks during construction activities.

Direct effects to the San Joaquin Kit Fox could involve the destruction of existing dens or direct mortality due to construction traffic in agricultural areas. Indirect effects would include physical vibration, presence of construction vehicles and workers, and bright lights if night construction were to occur.

Direct effects to the Western burrowing owl could involve the destruction of existing burrows or direct mortality due to construction traffic in agricultural areas. Indirect effects would include physical vibration, presence of construction vehicles and workers, and destruction or degradation of foraging habitat adjacent to occupied burrows. Construction activities in the vicinity of an active nest have the potential to result in forced fledging or nest abandonment.

Construction of the levee improvements would not directly affect Swainson's hawks. Indirect affects would include physical vibration and presence of construction vehicles and workers. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment.

Construction of the levee improvements could potentially result in direct and/or indirect affects to tricolored blackbirds, mountain plovers, California horned larks or loggerhead shrikes if these species begins nesting in or adjacent to the project area prior to construction. Construction activities in the vicinity of nesting areas may cause destruction of nesting habitat.

Mitigation

Potential impacts on VELB would be reduced to less than significant through avoidance, and if necessary, through mitigation. A pedestrian survey of the construction footprint for blue elderberry shrubs would be conducted prior to any ground-disturbing activities. If any

elderberry shrubs are observed, USACE would reenter Section 7 consultation with USFWS. If possible, the area would be avoided through design. Unavoidable impacts on blue elderberry shrubs would be mitigated per USFWS mitigation requirements. Although no VELB populations are known to occur in the vicinity, their range is poorly described and improving habitat conditions could reduce the impacts of habitat fragmentation and benefit the species.

Potential impacts on the San Joaquin Kit Fox would be reduced to less than significant through avoidance and, if necessary, through mitigation. A kit fox survey would be conducted prior to any construction activities. Avoidance would be achieved by restricting construction activities within 50 feet of potential dens and within 100 feet of known dens. Additional avoidance or mitigation measures would be coordinated with USFWS.

Potential impacts on Swainson's hawks would be reduced to less than significant through avoidance. A qualified biologist would survey the project area and all areas within one-half mile of the project prior to construction. If the survey determines that a nesting pair is present, USACE would coordinate with CDFG and the proper avoidance and minimization measures would be implemented. To avoid potential effects on nesting Swainson's hawks, CDFG typically requires the avoidance of nesting sites during construction activities. These measures include avoiding construction during the breeding season and monitoring of any discovered nest site by a qualified biologist.

Potential impacts on burrowing owls would be reduced to less than significant through avoidance and, if necessary, through mitigation. A burrowing owl survey would be conducted prior to any construction activities. Avoidance would be achieved by restricting construction activities within 160 feet of occupied burrows during the non-breeding season and within 250 feet of occupied burrows during the breeding season. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be permanently preserved contiguous with occupied burrows for each pair of breeding burrowing owls. If destruction of active burrows is unavoidable, burrowing owls would be passively relocated from active burrows during the non-breeding season, existing unsuitable burrows would be enhanced, and new burrows created at a ratio of 2:1. All burrowing owl mitigation measures would be conducted in coordination with CDFG.

Potential impacts on Tricolored blackbirds, Mountain plovers, California Horned Larks, and Loggerhead shrikes would be reduced to less than significant through avoidance. A qualified biologist would conduct a nesting survey prior to any construction activities. If the survey determines that a nesting pair is present, USACE would coordinate with CDFG and the proper avoidance and minimization measures would be implemented. To avoid potential effects on nesting birds, CDFG typically requires the avoidance of nesting sites during construction activities. These measures include avoiding construction during the breeding season and monitoring of any discovered nest site by a qualified biologist.

Potentially significant impacts on water quality would be avoided through implementation of mitigation measures described in Section 5.2.5, and potential adverse effects on critical habitat would be minimal.

Alternative 3: Chevron Levee with Freeboard (LPP)

Impacts of Alternative 3 would be similar to those occurring under Alternative 2 and would be mitigated to less than significant.

Mitigation

Mitigation of impacts on less than significant would be achieved through the implementation of measures described above for Alternative 2.

5.2.12 Invasive Plants and Noxious Weeds

Implementation of a project alternative would result in significant invasive plant or noxious weed impacts if it would promote the establishment of invasive plants or noxious weeds in native plant communities or agricultural fields.

Alternative 1: No Action

Several invasive plants and noxious weeds were observed along Orestimba Creek and in association with field margins and ditches. These populations are likely to remain established, and the seeds and propagules of these plants are likely to colonize areas where soil disturbance occurs. Soil disturbance is likely to continue to occur as a result of agricultural practices and land development including road improvements and other linear projects. Because invasive plants and noxious weeds are currently present along agricultural margins throughout the study area, continued soil disturbance would not promote further establishment of these plants. The impact of invasive plants and noxious weeds on native plant communities and agricultural fields would be less than significant.

Alternative 2: Chevron Levee (NED)

During construction, the project area would be scraped and grubbed to remove weedy vegetation from the project footprint. This layer of vegetation is likely to contain roots and seeds of invasive plants and/or noxious weeds; this material would be disposed of at the Fink Landfill or other designated disposal area. During construction, only clean, weed-free borrow material would be used. When leaving the borrow site, the disposal site, and construction site all construction vehicles would be brushed off to remove dust and any attached vegetation, thus reducing the spreading of weed parts or seeds. Upon the completion of construction, all barren areas (levee slopes, seepage berms, and staging areas) would be hydroseeded with native grasses in order to encourage growth of native vegetation and reduce the growth of invasive plants or noxious weeds. Vegetation maintenance along the chevron levee would be required to maintain levee integrity and would substantially limit the establishment of many invasive plants and noxious weeds. The maintained levee provides less suitable habitat for invasive plants and noxious weeds than field margins and would not substantially promote

establishment of these plants. The impact of invasive plants and noxious weeds on native plant communities and agricultural fields would be less than significant.

Mitigation

Impacts associated with invasive plants and noxious weeds would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

The effects of levee construction under Alternative 3 would be similar to those resulting from Alternative 2 and would be less than significant.

Mitigation

Impacts associated with invasive plants and noxious weeds would be less than significant and no mitigation is required.

5.2.13 Socioeconomics

Implementation of a project alternative would have a significant impact with regard to population, housing, and employment if it would induce substantial unplanned population growth in an area, either directly or indirectly, or if it would physically divide an established community.

Implementation of a project alternative would have a significant impact with regard to environmental justice if it would have substantial and disproportionate adverse effects on the social and economic welfare of minority or low-income populations.

Alternative 1: No Action

The No Action Alternative would not result in unplanned growth, either directly or indirectly. The Newman General Plan anticipates continued growth within Newman's SOI and planning area (see Figure 4-10) and establishes guidelines and regulations to minimize the impacts of growth on human and environmental resources. Flooding would continue to result in short-term and minor restrictions of connectivity between rural and urban areas; however, the limited duration and depth of flooding does not substantially isolate or divide communities. The Newman General Plan would encourage development of a mixture of commercial, residential, and public spaces suitable for local residents through planned zoning and extension of services.

Flooding occurring under the No Action Alternative would continue to result in substantial damage to private and public property, loss of personal income, and loss of public tax revenue. Because Newman is primarily populated by minorities, adverse effects on the economic welfare of the community essentially affect a minority population. Thus, the No

Action Alternative would continue to have significant adverse impacts on the economic welfare of a minority population.

Alternative 2: Chevron Levee (NED)

Alternative 2 would not result in unplanned growth and would reduce the adverse effects of flooding on economic welfare to a less than significant level. The NED levee would not remove any properties from FEMA-designated flood zones and, therefore, would not induce growth substantially. The alignment of the levee would substantially reduce flood damage risk within Newman's SOI, especially in the most densely developed areas within the city limits. The area of flood risk reduction is generally contiguous with Newman's SOI and includes most of Newman's Planning Area. The levee would not substantially increase the area of flooding within the Newman Planning Area west of the CCID Main Canal. Flood waters would be captured between the CCID Main Canal and the proposed levee and directed back towards Orestimba Creek. East-west roadways crossing the alignment would be temporarily closed during flooding; however, there are existing north-south roadways which provide alternative routes around the affected areas. These east-west roads generally provide access to I-5 and do not connect communities; therefore, Alternative 2 would not divide communities. Some increased flood depths may occur outside of Newman's Planning Area in rural areas. This flooding, which would occur without implementation of Alternative 2, could temporarily restrict access to rural residences or agricultural fields, but would not divide communities. The overall reduction in duration, depth, and extent of flooding would result in beneficial effects on overall connectivity during flood conditions.

The reduction of flood damage risk would have beneficial effects on the economic welfare of low income and minority individuals and the community. Furthermore, Alternative 2 could temporarily increase job availability resulting in short-term beneficial effects on local income as a result of construction-related jobs and investment, but it would not substantially affect population size, diversity, household size, or housing availability. Up to four residential properties and three agricultural structures are within the preliminary footprint of the proposed chevron levee. Relocation or demolition of these structures would be avoided through design measures where possible. If avoidance is not possible, owners would be compensated for the relocation or demolition of the structures.

Mitigation

Socioeconomic impacts would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

Socioeconomic effects resulting from Alternative 3 would be similar to those occurring under Alternative 2. The increased height of the LPP levee would further reduce the risk of flood damage, resulting in proportionally greater benefits to the economic welfare of Newman.

Mitigation

Socioeconomic impacts would be less than significant and no mitigation is required.

5.2.14 Land Use

A project alternative would create a significant land use impact if it would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project and adopted for the purpose of avoiding or mitigating an environmental effect; or
- Result in unnecessary and unavoidable conversion of substantial areas of Prime Farmland, Unique Farmland, or Farmland of Local Importance to nonagricultural use.

Alternative 1: No Action

The No Action Alternative would have no effect on land use. Lands outside of Newman's city limits are under the jurisdiction of Stanislaus County, which designates these lands as agricultural. Newman's General Plan, which designates lands outside of its city limits as non-agricultural, is in conflict with the Stanislaus County Plan. However, as plans for development are proposed within the County, these projects would be evaluated for compliance with existing City and County regulations and guidelines, and the County would support incorporation by Newman of lands for approved developments. The vast majority of these lands are designated Prime Farmlands under the Farmland Protection Policy Act and would be converted to non-agricultural use. Any growth beyond existing development would result in impacts on Prime Farmland; however, Newman and Stanislaus County implement numerous measures to limit the effects of growth on farmland conversion and on the daily operation of farmland. The No Action Alternative would have a less than significant impact.

Alternative 2: Chevron Levee (NED)

The chevron levee would be located on lands under the jurisdiction of Stanislaus County, and the Stanislaus General Plan designates these lands as agricultural. The County, which is the local sponsor, intends to revise its zoning designation upon approval of this project, and no conflicts would occur. The alignment of the chevron levee generally coincides with the western boundary of Newman's SOI and would reduce flood damage within the areas proposed for development over the next 20 years. A small area of land outside of Newman's Planning Area would receive flood risk reduction, while a substantial area of land within the western portion of Newman's Planning Area would experience induced flooding. Growth within the Planning Area is not anticipated to occur until after 2030, and Newman would have adequate time and space to redirect future plans towards development of equally suitable lands within and adjacent to unaffected portions of its Planning Area. Thus, the proposed levee would not conflict with any land use plans or zoning.

The chevron levee would be located on Prime Farmlands. The Farmland Protection Policy Act ensures that Federal actions do not cause farmland to be irreversibly converted to nonagricultural uses in cases in which other national interests do not override the importance of the protection of farmland or otherwise outweigh the benefits of maintaining farmland resources. Impacts on Prime Farmland were evaluated using the California Land Evaluation and Site Assessment (LESA) model. LESA has been approved as an alternative to the FPPA model for quantifying impacts on Prime Farmlands and other important soils (7 C.F.R. § 658.4 (f)). Scoring thresholds are based upon both the total LESA score as well as the component LE and SA scores (Table 5-2). A total LESA score of 80 to 100 points is considered significant (Table 5-3). The footprint of the LPP levee was modeled using LESA and, as discussed below, the impacts on Prime Farmland would be considered significant. Although Alternative 2 would occupy a smaller footprint than Alternative 3, a LESA evaluation would result in a similar score due to the overall size of the project and the high value of surrounding farmlands. Section 1548 of the FPPA states that the FPPA does not provide a basis for challenging a Federal project that may affect farmland, but allows for a challenge of the action when a state policy or program exists to protect farmland (7 C.F.R. § 658.3 (d).

Table 5-2: LESA Score for LPP Levee

Factor	Score	Weight	Weighted Factor Score
Land Evaluation (LE)			
Land Capability Classification	99	0.25	24.71
Storie Index	80	0.25	20.00
LE Subtotal		**0.50**	**44.71**
Site Assessment (SA)			
Project Size	100	0.15	15.00
Water Resource Availability	100	0.15	15.00
Surrounding Agricultural Land	100	0.15	15.00
Protected Resource Land	60	0.05	3.00
SA Subtotal		**0.50**	**48.00**
Final Score			**92.71**

In California, farmlands are protected under the California Farmland Conservancy Program (CFCP). The CFCP seeks to encourage the long-term, private stewardship of agricultural lands through the voluntary use of agricultural conservation easements. There are no CFCP conservation easements on potentially affected lands. Additionally, the California Land Conservation Act, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural use. In return, landowners receive property tax assessments which are

much lower than normal because they are based on farming and open space uses as opposed to full market value. Within Newman's Planning Area and outside the SOI, lands held under Williamson Act Contracts occur on the flood side of the levee and would not be affected by the proposed project. The majority of lands within the area of flood damage risk reduction, especially within the Primary SOI and SOI, are not held under Williamson Act contracts or are held under Williamson Act contracts set to expire by 2014. Lands directly converted to non-agricultural use as a result of constructing the chevron levee are currently planned for development as residential areas within the next 20 years. The levee would not remove any lands from FEMA-designated flood zones; and therefore would not induce development or result in indirect conversion of Prime Farmlands.

Although the direct impacts of levee construction would remove an area of Prime Farmlands from agricultural production, Alternative 2 would not induce growth, conflict with a CFCP conservation easement, directly remove lands from Williamson Act contracts, or induce removal of lands from Williamson Act contracts. The area of the impacts has been minimized to the maximum extent practicable through engineering design, and other locations assessed for the placement of the levee would result in substantial impacts on other resources including endangered species, traffic, and the ability to conduct flood fighting efforts. The policies and ordinances of the City of Newman and Stanislaus County work together to ensure that conflicts between land uses is minimized when lands are developed for non-agricultural use. By ensuring consistency with State and local polices and avoiding the unnecessary and unavoidable conversion of Prime Farmland, implementation of Alternative 2 would result in a less than significant impact.

Mitigation

Impacts on land use would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

Alternative 3 would result in impacts on land use that are similar in quality and quantity to those occurring under Alternative 2. Because the Alternative 3 footprint is slightly larger than the Alternative 2 footprint, a LESA was conducted using quantities for the LPP levee. The quantity of impacted Prime Farmland was delineated as the area of the levee footprint plus the area of maintenance roads minus the area of existing maintenance road along the east side of the CCID. The LESA results (Table 5-2) would be considered significant under the LESA scoring thresholds. However, as described above, these impacts would occur on lands within Newman's SOI and would be developed over the next 20 years. Thus, the action would not conflict with State or local policies or programs to protect farmland. By ensuring consistency with State and local polices and avoiding the unnecessary and unavoidable conversion of Prime Farmland, implementation of Alternative 3 would result in a less than significant impact.

Table 5-3: California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39	Not Considered Significant
40 to 59	Considered Significant only if LE and SA subscores are each greater than or equal to 20
60 to 79	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100	Considered Significant

Mitigation

Impacts on land use would be less than significant and no mitigation is required.

5.2.15 Transportation

A project alternative would have a significant impact on traffic or transportation if it would:

- Degrade traffic flow and safety to conditions below thresholds established on Newman roadways, or to an LOS of C, except for Merced Street downtown and Highway 33 where Newman has established less stringent thresholds due to existing constraints and the desire to maintain the community character;
- Substantially increase hazards due to a design feature (such as sharp curves or dangerous intersections) or incompatible uses (such as farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs supporting alternative transportation.

Alternative 1: No Action

Current transportation infrastructure is sufficient to provide a LOS of C or better for Newman and Stanislaus County managed roadways and intersections in the study area. Continuing growth within and around Newman would increase traffic volumes on roadways in the study area. Existing development limits improvement of many roads within the city limits, and LOS on these road segments is anticipated to be unacceptable as a result of continued growth. The LOS of intersections within Newman's city limits would be similarly affected but can be improved to a LOS lower than C with installation of traffic signals. Newman has implemented plans and policies to minimize the impact of projected growth on traffic within the city limits.

Flooding can result in temporary road and railway closures; however, access to lands on either side of Highway 33 is provided by arterial roadways, and emergency access would not be

significantly impacted. Impacts on transportation resulting from the No Action Alternative would be less than significant.

Alternative 2: Chevron Levee (NED)

Alternative 2 would result in minimal, short-term impacts on traffic, but would not substantially increase hazards due to design features, would not substantially restrict emergency access, and would not conflict with alternative transportation policies, plans, or programs. Construction activities would require moving large quantities of soil, construction materials, and heavy equipment into and out of the study area. The number of trips to and from construction activities would likely be less than 100 per day, including commute of workers and movement of materials. This volume is less than 10 percent of the total anticipated volume for any given road managed by Newman. Worker commutes, approximately half of the resulting increase, would likely occur during peak traffic hours. However, LOS is currently A on most city- and county-managed roads, and these roads are capable of accommodating a moderate, temporary increase in traffic without substantial change to LOS. During construction of chevron levees, truck traffic is likely to increase on Stuhr, Eastin, and Orestimba roads. However, even with the increased truck traffic, the LOS of these roadways is not anticipated to be lower than C with implementation of Newman's General Plan. Alternative 2 would not substantially affect LOS of impacted roadways, and impacts on traffic would be less than significant.

Detours would be required on Stuhr, Orestimba, Draper, and Shiells roads for up to two weeks each during levee construction. Stuhr Road is the major access route near Newman between I-5 and State Highway 33. A detour around Stuhr Road from Newman to I-5 would route traffic through Newman and could temporarily reduce LOS on these streets. Alternatively, access to I-5 is available within 10 miles of Newman through either Crows Landing and Fink roads to the north or through Gustine and Sullivan roads to the south. Orestimba, Shiells, and Draper roads are connected to Stuhr Road on the west side of the proposed levee and would provide local access to rural residences and agricultural fields. Detour routes are available that would result in minimal delays to commuters and minimal impacts on LOS, and detours would be in place for a minimal duration; thus, impacts on traffic would be less than significant.

Increased depth of flooding is expected to be minimal; however, inundated roadways would result in hazardous conditions and would significantly impact transportation safety. Impacts would be mitigated to less than significant. During flood events, roadways north of the chevron levee could be temporarily inaccessible. Alternative southbound and northbound routes to I-5 would remain accessible from Highway 33. Emergency access to areas within the city limits would not be affected. Eastin Road would remain accessible for emergency response in rural areas and would not substantially add to response times.

The Newman General Plan denotes a proposed bicycle route along the CCID within Newman's SOI. This bicycle path would either cross over the proposed chevron levee at Jenson

Road, or the bicycle path could be built on the levee. Either way, the levee would not preclude development of this alternative-transportation route.

Mitigation

Where increased depth of flooding results in hazardous conditions, installation of temporary barriers and signage to prevent motorists from entering inundated roadways would mitigate transportation safety impacts to less than significant.

Alternative 3: Chevron Levee with Freeboard (LPP)

Impacts on traffic would be similar to those occurring as a result of Alternative 2. Because existing roadways are capable of supporting a minimal increase in traffic without substantial reductions of LOS, and because detour routes would only be required for a brief period, Alternative 3 would have less than significant impacts on traffic in the study area. Inundated roadways could result in hazardous conditions and would significantly impact transportation safety, but would be mitigated to less than significant as described below.

Mitigation

Installation of temporary barriers and signage to prevent motorists from entering inundated roadways would mitigate transportation safety impacts to less than significant.

5.2.16 Utilities and Public Services

A project alternative would have a significant impact related to utilities and public services if it would:

- Result in substantial adverse physical impacts associated with the need for of new or physically altered public service or facilities, including police service, fire protection, school, library, drinking water, wastewater, and stormwater collection facilities;
- Substantially increase need for new or physically altered public service or facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objective;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- Be served by a landfill with insufficient permitted capacity to accommodate the buildout of Newman's General Plan solid waste disposal needs.

Alternative 1: No Action

With implementation of Newman's General Plan, future growth would not exceed the capabilities or capacity of Newman to provide utilities and public services, including police service, fire protection, schools, libraries, or drinking water, wastewater, and stormwater collection facilities. Although anticipated growth would require improvement of public services and facilities, the impacts of induced development resulting from improved utilities and services would be mitigated to less than significant through implementation of City of Newman policies and regulations.

Alternative 2: Chevron Levee (NED)

Flood risk reduction measures would not require the expansion of utilities or public services. The farm road alignment would not extend flood damage risk reduction to substantial areas outside of Newman's proposed SOI. The chevron levee would alter existing drainage patterns, resulting in a reduced demand on City facilities during flood events, and no new stormwater drainage systems would be required as a result of Alternative 2. The integrity of the CCID Main Canal, its capacity to deliver irrigation water, and the quality of irrigation waters in the canal would not be affected. Overhead electric power distribution lines along Stuhr Road would be temporarily relocated within the construction right-of-way, but service would be continuous during and after chevron levee construction.

Soils unsuitable for levee construction but suitable for agricultural use may be disposed of in adjacent agricultural fields, as approved in writing by USACE and the affected landowner. Any material unsuitable for levee construction or for disposal on agricultural fields would be disposed of in the Fink Road Landfill. The Fink Road Landfill has a permitted capacity until 2022 or 2023, depending on the type of permitted waste generated by the cogeneration versus municipal solid waste. In order to accommodate waste after 2023, the Fink Road Landfill has applied for a permit with Stanislaus County to expand its site westward onto adjacent property owned by the county. A recycling center would also be included in this expansion in order to reduce the total amount of landfill waste. The Fink Road Landfill is currently permitted to accept up to 2,400 tons of waste per day. Impacts on utilities and public services from the implementation of Alternative 2 would be less than significant.

Mitigation

Impacts on utilities and public services would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

Impacts on utilities and public services would be similar to those described under Alternative 2 and would be less than significant.

Mitigation

Impacts to utilities and public services would be less than significant and no mitigation is required.

5.2.17 Recreation

The proposed project would have a significant impact on recreational resources if it would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated; or
- Would result in substantial adverse physical impacts associated with the need for new or physically altered parks or recreational facilities.

Alternative 1: No Action

Newman offers sufficient recreational opportunities through public parks and would be able to maintain sufficient recreational area to population ratios meeting future needs for recreational opportunities without adversely impacting other resources. Following the Newman General Plan, a bicycle path north of the CCID Main Canal would be developed over the next 10 years. Therefore, the No Action Alternative would have a less than significant impact on recreation.

Alternative 2: Chevron Levee (NED)

With the implementation of Alternative 2, no adverse effects would occur to recreation resources in the area. Construction of the chevron levee east of the CCID Main Canal would not prohibit development of the proposed bicycle path and would not restrict access to or impede views from the proposed path, and recreation would not be impacted. Alternative 2 would not impact existing and future recreation opportunities.

Mitigation

As a result of Alternative 2, adverse effects to recreation would not occur and no mitigation is required. Relocation of the proposed bicycle route onto the proposed chevron levee could reduce costs of the path, enhance the recreational experience, and minimize cumulative impacts on surrounding land use by allowing multiple uses of land within the same footprint.

Alternative 3: Chevron Levee with Freeboard (LPP)

Similar to Alternative 2, Alternative 3 would not have an impact on recreational resources.

Mitigation

Recreational impacts would not occur, and no mitigation is required.

5.2.18 Aesthetics

The implementation of the proposed project would have a significant impact on visual and aesthetic quality if it would:

- Substantially or demonstrably result in a negative aesthetic alteration to the existing character of the area. A substantial alteration is characterized by a negative "sense of loss" of character or unique resources;
- Have a substantial adverse effect on a scenic vista; or
- Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.

Alternative 1: No Action

Features that define the character of the area identified by the Newman General Plan (2007) include its distinct neighborhoods and areas, gateways, its primary corridor Highway 33, and its trees and landscaping. As Newman grows, development is likely to impact some of these features. The General Plan contains policies that work in conjunction with current City design and development regulations to ensure that new development complements the existing aesthetic fabric of City of Newman and its surrounding environment, and does not threaten scenic corridors or exacerbate issues of light and glare. Because each of the characteristic features is susceptible to flood damage, the No Action Alternative would have a significant effect on the character of the area**.**

Future flooding would not degrade the physical appearance of features which contribute to scenic vistas, including farmlands, the Diablo Range, and riparian habitats along Orestimba Creek and the San Joaquin River. Although farmlands are functionally impacted following flooding, they remain open spaces and continue to contribute to the rural quality of views. Similarly, riparian habitats may be damaged but would retain the undeveloped appearance which contributes to the scenic views. Flooding does not affect light or glare.

Alternative 2: Chevron Levee (NED)

Although construction would temporarily detract from aesthetic values, the Stuhr Road levee alignment would not have a long-term adverse effect on the aesthetic and visual resources of the area. The height of the proposed levee along the CCID Main Canal would not be significantly higher than the existing canal berm. The CCID Main Canal is an existing

component of the agricultural setting which contributes to the area's viewshed. If construction occurs at night, the use of lighting would have a significant short-term impact; however, the chevron levee would not have a long-term impact on light or glare. If construction activities affect the Newman Gateway at Stuhr Road, aesthetics would be significantly impacted, but would be mitigated to less than significant as described below.

Mitigation

Nighttime construction would be avoided to the extent practicable. If nighttime construction is unavoidable, shielding would be used to direct light away from residential areas and onto the construction area. The Newman Gateway at the CCID Main Canal and Stuhr Road would be avoided or relocated if necessary and the aesthetic quality of the gateway would be unaffected or improved. These mitigation measures would reduce potential aesthetic impacts to less than significant.

Alternative 3: Chevron Levee with Freeboard (LPP)

The impact of Alternative 3 would be similar to those resulting from implementation of Alternative 2. Construction activities could result in significant short-term impacts, but would be mitigated to less than significant. Although the LPP levee would be taller than the NED levee, it would not be significantly higher than the CCID Main Canal and thus would not impact views.

Mitigation

Short-term impacts would be mitigated to less than significant through implementation of measures described under Alternative 2.

5.2.19 Noise

Implementation of a project alternative would result in a significant noise impact if it would:

- Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies;
- Expose people to or generate excessive groundborne vibration or groundborne noise levels;
- 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; or

- Result in the encroachment of incompatible land uses near known noise producing industries, railroads, airports, and other sources.

Alternative 1: No Action

Development occurring as a result of implementing the Newman General Plan would result in an increase of traffic on city-, county-, and state-maintained roadways. Of these roadways, Highway 33, Upper Road, Prince Street, Barrington Avenue, Merced Street, Hills Ferry Road, Canyon Creek Drive, Kern Street, Driskell Avenue, and Inyo Avenue are adjacent to existing residences within Newman, and would experience a substantial permanent increase in ambient noise levels. Residences located adjacent to roadways with low existing traffic volumes would also experience a substantial permanent increase in ambient noise levels, including Fig Lane, Main Street, Balsam Drive, Eucalyptus Avenue, Orestimba Road, and Hoyer Road. Although the proposed General Plan includes policies and actions that would serve to reduce the identified noise increases in Newman, it does not eliminate the significant unavoidable impact with regard to noise.

Newman and Stanislaus County regulations would reduce any construction-related groundborne vibrations to less than significant. Periodic increases in ambient noise levels resulting from construction associated with new development or infrastructure maintenance would be similarly mitigated. City and County policy and regulation would prevent encroachment of incompatible land uses. However, as a result of increased traffic near residential areas, the No Action Alternative would have a significant impact on noise.

Alternative 2: Chevron Levee (NED)

Stanislaus County (2008) has established land use compatibility guidelines, which promote the development of new land uses within areas of compatible exterior noise exposure (Table 5-4).

Table 5-4: Stanislaus County Land Use Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (DNL, dBA)		
	Acceptable	Conditional	Unacceptable
Residential – Low-Density-Single Family, Duplex, and Mobile Homes	50 - 60	60 - 70	> 70
Industrial, Manufacturing, Utilities, and Agriculture	50 - 75		> 75

Source: Stanislaus County, 2008

The State of California General Plan guidelines require the following noise-sensitive areas be considered in the development of each community's General Plan: schools, hospitals, convalescent homes, churches, sensitive wildlife habitats, and use deemed noise-sensitive by the local jurisdiction. Neither Stanislaus County nor Newman identifies locally specific noise-sensitive receptors. Stanislaus County requires the evaluation of mitigation measures for construction projects that would cause the DNL at sensitive uses to increase by 3 dBA or more and exceed the "normally acceptable" level, or cause the DNL at noise-sensitive uses to increase 5 dBA or more and remain "normally acceptable." Newman further requires evaluation of mitigation for construction activities lasting more than one construction season that cause noise levels to exceed an hourly average of 60 dBA and exceed existing ambient noise levels by 5 dBA or more at a sensitive receiver.

Earth compaction and earthmoving equipment such as dump trucks and bulldozers would be the loudest source of noise during construction. Operation of typical earth-moving equipment produces noise emissions up to 81 dBA at the source and is typically attenuated to less than 60 dBA within approximately 700 feet. Noise receptors within 700 feet of the construction footprint include: rural residences on agricultural. DNL at any given location near construction would be less than 60 dBA for several reasons. Because the project is linear, construction activities are not expected to occur at one location for more than several weeks. Because DNL averages noise over an entire year, intermittent peaks of 81 dBA for short periods would not substantially affect DNL values. The impact of construction activities on long-term ambient noise levels would be less than significant.

Noise levels could exceed an hourly average of 60 dBA at noise receptors within 700 feet of construction. Rural residences are typically located within or near clusters of agricultural facilities and ambient noise levels are likely to be affected by intermittent noise caused by equipment maintenance and by seasonal harvesting and field operations. Ambient noise levels at residences and commercial operations along Stuhr Road are affected by traffic along Stuhr Road, Highway 33, and the UPRR. Because existing sources of intermittent and long-term noise affects ambient noise levels near residences potentially affected by construction, construction activities are not likely to increase DNL by more than 5 dBA. The impact of construction activities on intermittent ambient noise levels near residences would be less than significant.

Mitigation

Measures to further minimize noise emissions would include restriction of nighttime construction near residences, location of staging areas at least 700 feet from residential areas, design of construction and detour routes that avoid noise-sensitive receptors to the extent practicable, and proper maintenance of equipment.

Alternative 3: Chevron Levee with Freeboard (LPP)

The impacts of Alternative 3 on the noise environment would be similar to those occurring under Alternative 2. Residences within 700 feet of the proposed chevron levee would be further impacted due to the additional time required to increase the levee height. However, due to the linear nature of the project, construction noise would not substantially affect long-term ambient noise levels at any one location. Because these residences are located within the vicinity of agricultural land use, temporary increases of noise would not substantially affect ambient noise levels and would also be less than significant. Intermittent increases in noise levels near sensitive wildlife habitats would be significant, but would be mitigated to less than significant.

Mitigation

Mitigation measures described under Alternative 2 would reduce noise impacts and avoid any significant impacts on sensitive receptors.

5.2.20 Hazardous, Toxic, and Radiological Materials and Wastes

A project alternative would have an impact related to hazards or hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Emit hazardous emissions or handle hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or
- Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment (Health & Safety Code § 65962.5).

Alternative 1: No Action

Many of the commercial and industrial operations in Newman utilize and generate hazardous materials as part of their daily operations, including gasoline stations, dry cleaners, and automotive repair shops. Additionally, hazardous materials are utilized by agricultural operations in the form of pesticides, herbicides, and fertilizers, and by residential households, including cleaning supplies and paints. The potential increase in development permitted under the Newman General Plan could result in more hazardous materials being used, stored, or transported through and discarded within Newman, which would increase the potential risk

associated with hazardous materials and waste. To address these issues, the Newman General Plan includes policies and actions that are intended to limit the impact hazardous materials could have on the population and environment, and the potential impacts would be less than significant.

Alternative 2: Chevron Levee (NED)

The operation of construction equipment during levee construction could potentially result in the release of hazardous materials as a result of leaks or spills. If a large spill were to occur, impacts on water quality and agricultural resources may be significant, but would be mitigated to less than significant as described below. There are no sensitive receptors within 0.25 mile of the construction footprint. The extension of flood risk reduction measures to developed areas within Newman would reduce the risk of flooding in commercial and industrial facilities utilizing hazardous materials, thereby reducing potential negative impacts associated with flood waters.

As discussed in Section 4.2.20, a search of Federal, state, local, and tribal databases was conducted in 2010 (EDR, 2010) for records of historical and existing hazardous material generation, handling, transport, or storage facilities within 1 mile of the construction footprint (Figure 4-13, Table 4-11). A total of six USTs were identified in the vicinity of the proposed levee. Only one appears close to the footprint of the proposed alignment. Since the UST was listed on a historic database, its current status is unknown. Implementation of the mitigation measures would result in a less than significant impact.

Mitigation

Mitigation measures to avoid or minimize impacts as a result of spills or leaks would be included in a SWPPP, as described in Section 5.2.3, and SPCCP to be developed prior to construction. An SPCCP would include best management practices, such as the use of drip pans and containment berms, to limit the potential release of hazardous materials and toxic substances.

A Phase I Environmental Site Assessment to identify potential hazardous materials and wastes within the project area would be conducted during the PED phase. Subsequent assessments would be conducted to analytically quantify any potential contaminants detected and to delineate the range of contamination, if necessary.

Alternative 3: Chevron Levee with Freeboard (LPP)

Hazardous materials and wastes would be handled and disposed of similar to Alternative 2 and could potentially result in significant impacts, but would be mitigated to less than significant.

Mitigation

Measures to avoid the uncontrolled release of hazardous materials and toxic substances, as described under Alternative 2, would mitigate the potential for impacts to less than significant.

5.2.21 Cultural Resources

Effects to cultural resources would be from four types of construction-related actions: (1) impacts to the integrity of the visual and physical setting of historic properties, (2) impacts to the structural integrity of historic buildings and structures from demolition, (3) impacts from earth moving activities, and (4) impacts from clearing and grubbing and follow-on planting.

Effects are considered to be adverse if they:

- Alter, directly or indirectly, any of the characteristics of a cultural resource that qualify that resource for the NRHP so that the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association is diminished; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Alternative 1: No Action

Newman contains numerous buildings that are over 50 years of age and may be historically significant. Although the majority of new development under the proposed General Plan would take place on land without existing structures, redevelopment within the historic downtown or in-fill development in older residential areas could result in the demolition, destruction, relocation, or alteration of buildings that are historically significant and eligible for listing in the NRHP. In addition, there are a number of rural buildings that are located outside Newman but within the proposed SOI that may be adversely affected by new development as allowed by the proposed General Plan. Development allowed under the proposed General Plan would also involve construction activities that could result in the disturbance of undiscovered archaeological and paleontological resources during grading or other on-site excavation activities. City policy includes measures to mitigate adverse affects to cultural resources.

Flooding currently effects historic downtown Newman, and potentially effects historical buildings in residential and rural areas. Remediation of flood damage could result in adverse effects on these buildings if repairs are not compatible with the historic building in design, materials, details, and character-defining features of historic buildings. Extensive flood damage could result in the reduction of the historical importance of affected buildings, resulting in significant impacts.

There are no known archaeological resources or human remains identified within the floodplain. Due to the generally shallow depth of flooding, such resources would likely remain undiscovered and are not likely to be adversely affected.

Alternative 2: Chevron Levee (NED)

The CCID Main Canal is potentially eligible under Criterion A for the NRHP based on its association with the San Joaquin and Kings River canals, a valley-wide system for water distribution. The CCID Main Canal is located west of the proposed chevron levee and would not be directly impacted.

Because the entire construction footprint has not been surveyed, there may be potential for unidentified and subsurface NRHP eligible cultural resources within the construction footprint. Any loss of such resources would be significant, but would be mitigated to less than significant as described below.

There are no known historic resources that would be adversely affected by induced flooding, and due to the generally shallow depth of flooding resources that remain undiscovered are not likely to be adversely affected by induced flooding.

The implementation of flood risk reduction measures would benefit historic homes and other structures in the developed areas of Newman. Newman's regulations and policies would prevent any adverse effects to existing structures resulting from renovation or nearby development.

USACE and the California SHPO have entered into a Programmatic Agreement (PA) to avoid and minimize effects to potentially NRHP-eligible cultural resources within the area of potential effects. The PA includes requirements for the identification of NRHP eligible historic properties in the area of potential effects (APE) and the assessment of adverse effects to such properties; in consultation with the SHPO, Native American Tribes, the public, and any other interested parties.

Any cultural resources discovered in the APE during a survey would be evaluated for NRHP eligibility and any potential adverse effects to such properties would be resolved. If previously unidentified cultural resources are discovered during ground disturbing activities, all construction in the vicinity of the find would be halted immediately. Construction would not continue until USACE, in consultation with the SHPO, has assessed the NRHP eligibility of the resources, and mitigated any adverse effects, as stipulated in the PA. The PA would ensure less than significant impacts to cultural resources.

Mitigation

Impacts to cultural resources would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

Direct and indirect effects on historic properties would be similar to those occurring under Alternative 2 and would be less than significant.

Mitigation

Impacts to cultural resources would be less than significant and no mitigation is required.

5.2.22 Cumulative Effects

Cumulative effects are evaluated by first identifying other past, present, or reasonably foreseeable future actions that could have direct or indirect environmental effects in the cumulative study area. The following regional programs, potential projects, and planning efforts have been identified for the cumulative study area, which varies depending on the environmental issue under consideration.

Regional planning programs with measures being planned or implemented in the study area include those listed in Section 1.6 of this Feasibility Report/EA/IS. These include three programs aimed at improving the biological environment: the California Bay-Delta Program (CALFED) to restore ecological health and improve water management of the Bay-Delta; the CVPIA, which amends previous authorizations of the Central Valley Project to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with power generation; and the NRCS Wetland Reserve Program, which focuses on the restoration of a variety of wetland types and has been used to restore flood-damaged wetlands along the San Joaquin River. Projects identified in Section 1.6 include the Nature Conservancy Mount Hamilton project, which seeks to ensure permanent conservation management of nearly 500,000 acres within the Diablo Range west of Newman, and the Nature Conservancy Simon Newman Ranch project, which would prevent future subdivision and development of 33,000 acres in the upper watershed of Orestimba Creek.

A review of the Caltrans District 10 homepage identified several projects planned within the County, most of which would occur along Highway 99 and east of the San Joaquin River in the vicinity of Turlock and Modesto. Two currently programmed projects were identified in the Newman area. The Newman Downtown Plaza Improvement project is in the planning phase and includes the replacement of sidewalks, curbs, gutters, and addition of parking spaces along Highway 33 from Fresno Street to Tulare Street. Rehabilitation of Highway 33 from Jenson Road in Newman to near Patterson is in the construction phase.

The Stanislaus County Planning Department maintains a database of current projects being planned within the county. An online search of the database identified one project planned in the Newman area. California Transplants proposes to expand their greenhouse facility at the west end of Stuhr Road, adjacent to the Delta-Mendota Canal. The expansion project would be extended over a 3-year period and the company would employ 14 people during the planting season each year (January to June).

Newman has two specific plans within its proposed SOI, the Downtown Development Plan and the Highway 33 Plan, each of which promotes controlled development and renewal of

lands according to Newman's Adopted Vision Statement through preserving the historic fabric of downtown and surrounding neighborhoods, creating a walkable community providing a range of activities connected by pedestrian trails and bike paths, providing a range of housing types and a variety of employment options, and maintaining a sufficient level of infrastructure.

Alternative 1: No Action

Under the Alternative 1, it is assumed that local growth would occur as provided for in the Newman General Plan (Newman, 2007). The General Plan identifies several cumulative effects resulting from implementation of the general plan. As a result of anticipated growth and development forecast in the General Plan, the following cumulative impacts were determined by the City to be less than significant with implementation of mitigation measures:

- Degradation of the rural and agricultural setting of Newman and Stanislaus County;
- Loss or degradation of cultural resources as a result of grading and other construction activities;
- Increase in runoff affecting water quality;
- Location of additional population and structures within areas subject to flooding;
- Exposure of people to risk as a result of seismic activity;
- Loss of mineral resources;
- Exposure of people to hazardous materials and wastes; and
- Potential conflicts with other applicable plans, policies and regulations, including the County's General Plan.

As a result of anticipated growth and development, the following cumulative impacts would be significant even with implementation of mitigation measures:

- Loss of agricultural resources;
- General reduction in habitat values for existing resident and migratory species and cumulative loss of habitat for common and possible special-status species; and
- Exceedance of Valley Air District's regional clean air planning assumptions.

Under the No Action Alternative, cumulative impacts as described under Newman's General Plan would likely occur in the future. All of these impacts are associated with growth and development and would likely occur without the implementation of any risk reduction measures. Based on the findings in the General Plan Environmental Impact Report, USACE has independently determined that the cumulative impact of the Alternative 1 would be less than significant.

Alternative 2: Chevron Levee (NED)

Some of the direct and indirect effects identified in Sections 5.2.1 through 5.2.21 may result in incremental impacts on the environment when considered in light of other past, present, and reasonably foreseeable future actions. The following analysis of potential cumulative effects corresponds with the findings presented in Section 5.2.

Seismicity

As discussed in Section 5.2.1, the San Joaquin Fault underlies the proposed chevron levee. Although development of Alternative 2 would not directly expose people to adverse effects of seismic activity, it would expose them indirectly if a seismic-related levee failure were to occur. This would have an incremental cumulative effect when added to other past, present, and reasonably foreseeable future actions that could increase development within the study area. However, the potential for cumulative effects would be mitigated by the design of the levee in accordance with the State of California and USACE guidelines.

Geology

As discussed in Section 5.2.2, subsidence and/or liquefaction underlying the chevron levee under Alternative 2 could result in levee failure that would indirectly expose people to adverse effects. This would have an incremental cumulative effect when added to other past, present, and reasonably foreseeable future actions that could increase development within the study area. However, the potential for cumulative effects would be mitigated by the design of the levee in accordance with the State of California and USACE guidelines.

Soils

As discussed in Section 5.2.3, development of Alternative 2 has the potential for short-term erosion. This would have an incremental cumulative effect when added to the potential for soil erosion from similar past, present, and reasonably foreseeable future action in the study area. The potential for an incremental contribution to an adverse cumulative effect would be minimized through the use of best management practices and implementation of the SWPPP. Similar measures would be required of related present and reasonably foreseeable future projects in the study area to comply with the CWA.

Hydrology

As discussed in Section 5.2.4, the implementation of Alternative 2 would have a beneficial effect on hydrology by reducing the risk of property loss, injury, and death involving flooding. This feasibility study is the only known past, present, or reasonably foreseeable future project to consider flood protection for the study area. As a result, there is not a potential for an incremental cumulative impact.

Water Quality

As discussed in Section 5.2.5, the implementation of Alternative 2 would reduce flooding of agricultural and urban areas, thereby reducing the volume of polluted waters discharged to the San Joaquin River via Orestimba Creek, agricultural drains, or the Newman Wasteway. This feasibility study is the only know past, present, or reasonably foreseeable future project to consider the reduction of flooding in agricultural and urban areas in the study. There are, however, likely ongoing regulatory efforts to reduce the discharge of polluted water from agricultural and urban land uses. Implementation of Alternative 2 would make a significant beneficial contribution to cumulative efforts to improve water quality within the study area.

Groundwater

As discussed in Section 5.2.6, implementation of Alternative 2 would not have an impact on groundwater recharge in the planning area. It would not make a cumulative contribution to other past, present, or reasonably foreseeable projects dealing with groundwater recharge within the study area.

Waters of the U.S. and Wetlands

As discussed in Section 5.2.7, implementation of Alternative 2 would no have any effects on delineated wetlands or Waters of the U.S. It would therefore not make a cumulative contribution to a net loss of wetlands or degradation of Waters of the U.S.

Air Quality

As discussed in Section 5.2.8, the temporary emissions resulting from implementation of Alternative 2 would not exceed Federal and State *de minimis* thresholds, and therefore do not constitute a regionally significant contribution to air quality. Other present and reasonably foreseeable projects in the study area would be required to comply with regional air quality standards, which have been implemented to reduce adverse cumulative impacts. Therefore, the cumulative impact to air quality as a result of the proposed action would be less than significant.

Vegetation

As discussed in Section 5.2.9, implementation of Alternative 2 would result in approximately 152 acres of agricultural land being temporarily or permanently impacted. None of these lands are considered a natural community so there would not be any incremental contribution to cumulative impacts.

Wildlife and Fisheries

As discussed in Section 5.2.10, implementation of Alternative 2 would result in the temporary loss and degradation of approximately 152 acres of wildlife habitat associated with agricultural margins. The temporary loss of marginal habitat would have a minimal impact on wildlife populations due to the prevalence of equally suitable habitats nearby. There are no other reasonably foreseeable future projects that would result in a similar temporary degradation of agricultural margins. Therefore, the implementation of Alternative 2 would have a less than significant cumulative impact on wildlife and fisheries.

Special Status Species

As discussed in Section 5.2.11, there is a potential for habitats associated with special status species to be impacted by the implementation of Alternative 2. Other past, present, and reasonably foreseeable projects could also impact habitats associated with special status species. Avoidance is the primary mitigation measure identified for potential impacts associated with the implementation of Alternative 2. Avoidance of impacts would eliminate the possibility of an incremental contribution to cumulative impacts. It is assumed other projects would also be required to avoid impacts, thereby further reducing the potential for cumulative impacts.

Invasive Plants and Noxious Weeds

As discussed in Section 5.2.12, implementation of Alternative 2 could allow the establishment of invasive plants and noxious weeds along agricultural margins. Establishment of invasive plants and noxious weeds as a result of Alternative 2 would make an incremental cumulative contribution to the establishment of invasive plants and noxious weeds by other past, present, and reasonably foreseeable future projects in the study area. The levees proposed under Alternative 2 would provide a less suitable habitat for invasive plants and noxious weeds and would substantially limit the establishment of them along existing agricultural margins. The cumulative effect would therefore be beneficial.

Socioeconomics

As discussed in Section 5.2.13, implementation of Alternative 2 would not divide the community and would have beneficial effects on low income or minority communities in the planning area. These beneficial effects would make an incremental contribution to the cumulative socioeconomic effects resulting from other past, present, or reasonably foreseeable future projects.

Land Use

As discussed in Section 5.2.14, implementation of Alternative 2 would remove an area of Prime Farmlands from agricultural production. This conversion of farmland could make an incremental contribution to the cumulative effect of farmland conversions associated with

other past, present, and reasonably foreseeable future projects. As discussed under the No Action Alternative, however, the County's General Plan already anticipates the build out of the agricultural area that would be converted to non agricultural use under Alternative 2. The County determined that loss of agricultural resources is a significant and unavoidable cumulative effect. Implementation of Alternative 2 would not introduce a cumulative effect not previously anticipated or disclosed by the County.

Transportation

As discussed in Section 5.2.15, implementation of Alternative 2 would result in minimal, short-term impacts on traffic that could have an incremental impact when added to other past, present, and reasonably foreseeable actions within the study area. The transportation network within the study area currently has levels of service high enough to accommodate the temporary increase in truck traffic that would result from the implementation of Alternative 2. Any road closures or detours resulting from the implementation of Alternative 2 would be coordinated with local transportation and public works agencies to avoid adverse cumulative effects. The cumulative impact would be less than significant.

Utilities and Public Services

As discussed in Section 5.2.16, implementation of Alternative 2 would not require the expansion of utilities or public services. Short-term and localized, minor impacts to utilities to accommodate the construction of the levee would not be cumulative in nature. Alternative 2 would make a cumulative contribution to the production of solid waste. The Fink Road Landfill has existing or planned capacity sufficient to accommodate forecasted volumes for present and reasonably foreseeable projects in the study area. The proposed action would have a less than significant cumulative effect.

Recreation

As discussed in Section 5.2.17, implementation of Alternative 2 would not have any adverse effects on recreation in the study area. It would therefore not make any incremental contribution when added to the recreation effects of other past, present, or reasonably foreseeable projects within the study area.

Aesthetics

As discussed in Section 5.2.18, implementation of Alternative 2 would not degrade the physical appearance of features which contribute to scenic vistas in the study area. It would therefore not make any incremental contribution when added to the aesthetic effects of other past, present, or reasonably foreseeable projects within the study area.

Noise

As discussed in Section 5.2.19, implementation of Alternative 2 would result in short-term and localized increases in ambient noise levels. Construction activities related to one or more past, present, or reasonably foreseeable future projects would likely have similar impacts. Since they would not occur in the same location as the levee construction, implementation of Alternative 2 would not make an incremental contribution to an adverse cumulative effect.

Hazardous, Toxic, and Radiological Waste

As discussed in Section 5.2.20, implementation of Alternative 2 there is a potential for impacts associated with spills and leaks. Spills and leaks associated with Alternative 2 could have an incremental impact when added to similar impacts from other past, present, and reasonable foreseeable future actions in the study area. The potential for adverse cumulative impacts is minimized by the CWA's requirement of a SWPPP. The proposed action would have a less than significant cumulative effect.

Cultural Resources

As discussed in Section 5.2.21, no adverse impacts to cultural resources are anticipated to occur with implementation of Alternative 2. There is always the possibility of an unanticipated discovery during ground disturbing activities. Depending on the nature of the resource, unanticipated impacts may have an incremental impacts when added to similar impacts from other past, present, or reasonably foreseeable future action in the study area. Impacts would be mitigated to a less than significant level through the implementation of measures outlined in a memorandum of agreement with the SHPO, as required by the National Historic Preservation Act.

Mitigation

Mitigation for cumulative impacts would be the same as identified for direct and indirect effects under each environmental issue area presented above.

Alternative 3: Chevron Levee with Freeboard (LPP)

The cumulative impacts of Alternative 3 would be similar to those occurring under Alternative 2 and would be less than significant.

Mitigation

Alternative 3 would not result in significant cumulative impacts, and no mitigation, other than measures to mitigate direct and indirect impacts previously described, would be required.

5.2.23 Unavoidable Significant Effects

Alternative 1: No Action

As a result of anticipated growth and development proposed under the Newman General Plan and other actions in the region, Newman anticipates unavoidable significant cumulative impacts on agriculture, air quality, transportation, noise, and wildlife habitat.

Alternative 2: Chevron Levee (NED)

With the implementation of measures to mitigate direct and indirect impacts of the action itself, as described under each resource assessment, all significant or potentially significant impacts would be avoided.

Alternative 3: Chevron Levee with Freeboard (LPP)

With the implementation of measures to mitigate direct and indirect impacts, as described under each resource assessment, all significant or potentially significant impacts would be avoided.

5.2.25 Irreversible and Irretrievable Commitment of Resources

Section 15126.2(c) of the CEQA Guidelines requires a discussion of the extent to which a proposed project would commit nonrenewable resources to uses those future generations would probably be unable to reverse. A project alternative would generally result in a significant irreversible impact if the irreversible commitment of resources, including direct and indirect commitments, is not justified.

Alternative 1: No Action

Development under the Newman General Plan would result in the conversion of agricultural lands to commercial, residential uses, and public uses. This development would constitute a long-term commitment 226 acres of land that were not previously designated for development to urban uses.

Development allowed under the Newman General Plan would also irretrievably commit nonrenewable resources to the construction and maintenance of buildings, infrastructure, and roadways. These include mining resources such as sand, gravel, steel, lead, copper, and other metals. Development also represents a long-term commitment to the consumption of fossil fuels, natural gas, and gasoline. Increased energy demands would be used for construction, lighting, heating, and cooling of new buildings, and transportation of people within, to, and from the planning area. The Newman General Plan policies and actions promoting energy conservation would result in some savings in nonrenewable energy supplies. Implementation

of the Newman General Plan would also result in an irreversible commitment of limited, renewable resources such as lumber and water. Policies and actions contained in the Newman General Plan that promote resource and water conservation and green building would result in some savings of renewable resources.

Irreversible changes to the physical environment could occur from accidental release of hazardous materials associated with development activities. However, compliance with State and Federal hazardous materials regulations and Newman General Plan policies is expected to maintain this potential impact at a less than significant level.

The irreversible commitment of resources occurring under the Newman General Plan would provide beneficial impacts to the socioeconomic conditions of Newman and Stanislaus County. Commitment of resources associated with all new development would be regulated by both Newman and Stanislaus County; thereby, ensuring the efficient and productive use of limited lands and resources and that these commitments are justified.

Alternative 2: Chevron Levee (NED)

Approximately 152 of Prime Farmland occurring within the Newman SOI would be converted to levee and access roads. Although future generations would be committed to maintaining the chevron levee as a flood risk reduction measure, this irreversible commitment of resources would be beneficial to both urban areas within Newman and surrounding agricultural land. Future development would occur primarily as a result of implementing Newman's General Plan, and Alternative 2 would not substantially influence future growth or contribute to the irretrievable commitment of resources occurring under the No Action Alternative. The irreversible and irretrievable commitment of resources would be less than significant and no mitigation is required.

Alternative 3: Chevron Levee with Freeboard (LPP)

The irretrievable and irreversible commitment of resources of Alternative 3 would be similar to those occurring under Alternative 2 and also would be less than significant and not require mitigation.

CHAPTER 6 – PUBLIC INVOLVEMENT

6.1 PUBLIC INVOLVEMENT PROGRAM

On March 4, 1999, a public meeting was held on the West Stanislaus Flood Reduction Project for Salado Creek and Orestimba Creek. At the time of this public meeting, Salado Creek was part of the study but has since been eliminated for purposes of expediency. Approximately 70 individuals attended. The sign-in sheet indicated that residents of the towns of Newman, Patterson, Crows Landing, Modesto, and outlying areas were represented. Following a presentation on the USACE planning process, comments were fielded from the public and agency representatives. No written statements were provided.

The local sponsor stated that the entire community was supportive of the project, except for one person, who later responded by letter. This individual represents the Indian Creek Land Trust, property owners in the watershed. Their concerns are summarized below:

"We are concerned with the Corps of Engineers proposal of widening and deepening the creek channel to a flow capacity of 20,000 cfs. We believe that in order to accomplish this capacity the channel would need to be widened by more than 50% and deepened by an additional 50%. We have a private bridge that crosses Orestimba Creek and we would require that it be upgraded so as to accommodate the proposed 20,000 cfs channel. There is at least one other private bridge that crosses the Orestimba between Kilburn Road and River Road, along with County bridges at both Kilburn and River Roads, respectively, that would all have to be mitigated as well. The CCID weir, the railroad trestle, straightening the 'horseshoe' bend and restoring the plant and wildlife habitat are not the only reconstruction projects involving the '20,000 cfs proposal'.

"We favor the construction of a retention reservoir west of Interstate 5 of sufficient capacity to meter 7,000 cfs until storm flows have been disbursed to below the 7,000 cfs flow rate, couple with some minor streamlining of the creek channel to provide 8,000 cfs capacity. Much of the creek currently has 8,000 cfs capacity. We favor this plan as being less invasive to the creek habitat, more acceptable to the community and possibly more cost effective. Such a proposal would eliminate the straightening of the horseshoe bend, reconstructing the railroad trestle and all the public and private bridges, and minimize the channel dredging and plant and wildlife restoration."

The only other letter received as a result of this meeting was from the Nature Conservancy, a landholder in the canyon. Their comments are summarized as follows:

"The Conservancy recognizes and appreciates the need to protect downstream communities from damage associated with peak flooding. We also wish to ensure that the alternatives developed, include the full range of measures for reducing flood damage, and that

alternatives are designed to minimize their impacts on the environment and on our investment."

"Finally we encourage the Corps to investigate a broad array of measures both upstream and downstream that individually or in combination would reduce the threats of flood damage while avoiding or minimizing adverse effects of detention on the natural features of the Simon-Newman Ranch or Orestimba Creek. In particular, we would recommend that the COE initiate a water conveyance study of Orestimba Creek to analyze in a comprehensive manner the drivers of flood-related damage and assess the feasibility of making conveyance improvements. The Conservancy stands ready to contribute to this overall effort by investigating non-structural measures such as increased stream vegetation and we encourage you to consider measures such as this in your analysis."

Figure 6-1: Public Meeting in Newman

A second public meeting was held on November 26, 2007 in Newman, California. The focus of the meeting was to present the remaining alternatives and lay out the process to evaluate and identify the NED plan. The study team presented the Civil Works Planning Process

and explained how the process requires the examination of a full array of alternatives. The process for identifying the NED plan was outlined. NED establishes the basis for cost sharing between the Federal government and the non-Federal sponsor.

Several alternatives were eliminated and the presentation explained why this was done. Smaller elements of those alternatives were combined with other alternatives to develop hybrid solutions, such as a short setback levee in one area, a removal of a constriction at a bridge, or the use of an existing agricultural ditch to drain excess floodwaters, for example.

The upstream dry dam site is owned by DWR. The property was purchased to use as a mitigation site for other DWR projects. It was discussed that the resource agencies oppose this alternative because of the presence of a Sycamore Alluvial Woodland stand both upstream and downstream from the proposed dam site. Mitigation for effects to the Sycamores would be required. The State has concerns regarding the proximity of the proposed dam to the California Aqueduct – a dam failure could have serious implications for the drinking water supply for Southern California.

The Mayor introduced the idea of a benefits assessment district where the beneficiaries of the project would be assessed to pay for the project. There are about 3,000 parcels in the floodplain – and these landowners currently pay flood insurance. With the construction of a flood management project, the flood insurance would be reduced for those parcels protected by the project and that reduction could then be used for the assessment instead.

The draft Feasibility Report/EA/IS will undergo public review to present the findings of the feasibility study and to provide the public an opportunity to express their views on the results and recommendations of the Orestimba Creek Feasibility Study. Floodplain maps describing the residual risk of flooding with the project are included Comments received during the 30-day comment period, as well as responses, will be presented in Appendix F, Comments and Responses.

6.2 INSTITUTIONAL INVOLVEMENT

6.2.1 Agency Participation

The study team hosts routine meetings to facilitate agency coordination by engaging other agencies that may be affected by the potential project and its implementation. DWR regularly attends the PDT Meetings to ensure continued coordination.

During the feasibility study, coordination with USFWS has been conducted in accordance with the Fish and Wildlife Coordination Act. The USFWS has provided USACE with a draft Coordination Act Report that includes their views on the tentatively selected plan. All USFWS recommendations will be given full consideration. The USFWS will coordinate their report with NMFS and CDFG.

6.2.2 Local and Regional Interests

In addition to the public workshops, a series of stakeholder meetings have been held since 2005 to discuss the problems, opportunities, significant resources, and potential measures and alternatives and the residual risk of flooding associated with each alternative. The meetings included study team members, representatives from the local community, and interested agencies and organizations. Information provided by the local and regional stakeholders guided the identification of resources problems and helped formulate the alternative plans to address the problems and identification of the tentatively selected plan. Participants in the meetings included:

- Local Landowners and Residents
- Stanislaus County
- U.S. Fish and Wildlife Service
- The Nature Conservancy
- California Department of Fish and Game
- Central California Irrigation District (CCID)
- Orestimba Creek Flood Control District
- City of Newman
- Congressman Dennis Cardoza's Office

6.2.3 California Northern Railroad (CNRR) and Union Pacific Railroad (UPRR)

The railroad line in the Study Area is operated by the CNRR, a regional line which transports mostly agricultural produce along the western side of the San Joaquin Valley. The rail line is owned by the UPRR and leased to CNRR.

A coordination meeting with representatives from the CNRR was held in the Sacramento District office on November 12, 2009 to discuss the levee interface with the railroad berm. The CNRR representatives provided information on construction standards and templates for work on the railroad berm. This information was used by the Civil Designers and Cost Engineer for developing quantities and costs for the study.

The current design includes a closure structure across the railroad tracks to prevent floodwater from overtopping the levee at this point. UPRR, which owns the tracks, has stated that the preferred method of dealing with the floodwater would be to raise the railroad berm rather than include a closure structure. Due to the high potential cost of raising the railroad berm and the associated changes to the depth and extent of the floodplain impounded on the west side of the railroad, the closure structure is recommended as the most cost effective and efficient element to address the overtopping issue.

CHAPTER 7 – LIST OF PREPARERS*

The individuals listed below were primarily responsible for the preparation of this report.

Table 7-1: List of Preparers

Name	Role in the Study
Integrated Feasibility Study	
Michelle Williams Project Manager USACE	Report Review, Schedule and Budget
Gary Butler Budget Analyst USACE	Budgeting and programming
Scott Miner Regional Technical Specialist USACE	Plan Formulation and Ecosystem Restoration
Sara Schultz Water Resources Planner USACE	Plan Formulation and evaluation. Report Preparation. Graphic Preparation
Doug Edwards Environmental Manager USACE	Report Preparation and Impact Assessment
Robin Rosenau Environmental Manager USACE	Report Preparation and Impact Assessment
Joe Griffin Cultural Resources Specialist USACE	Cultural Resources
Ajala Ali Project Manager DWR	State Coordination
Nick Applegate Economist USACE	Economic Analysis
Gary Bedker Agricultural Economist USACE	Agriculture Economic Damage Assessment
Peter Blodgett Hydraulic Engineer USACE	Hydraulic Design

Bob Collins Hydrologist USACE	Hydrology
Bob Vrchoticky Cost Engineering USACE	Cost Engineering
Glen Johnson Geotechnical Engineer USACE	Geotechnical Analysis and Report Preparation
Paul Hsia Civil Engineer USACE	Civil Design
Benson Liang Civil Design USACE	Civil Design
Martha Cole Real Estate Appraiser USACE	Real Estate Valuation
Todd Wixom Real Estate Specialist USACE	Real Estate
Anne Burman Attorney USACE	Legal Review
Ricky Okikawa Attorney USACE	Real Estate
Alarice Hansberry Attorney USACE	Legal Review
NEPA/CEQA Compliance Documentation	
Michael Hodson Project Manager Gulf South Research Corp. (GSRC)	EA/IS Project Manager; Soils and Water Quality
Steve Kolian Natural Resources Specialist GSRC	Air Quality and Noise
Ann Guissinger Planner GSRC	Land Use, Socioeconomics, Environmental Justice
Lucinda Freeman Archaeologist GSRC	Cultural Resources

Carey Perry Natural Resources Specialist GSRC	Vegetation, Wildlife, and Sensitive Species
Agency Technical Review (ATR)	
Roger Dale Setters, PE Engineer USACE	ATR Chairperson and Planning Review
Michael Hallisy Economist USACE	ATR Economics
Robert Browning Economist USACE	ATR Agricultural Economics
Stephen Scissons Hydraulic Design USACE	ATR Hydraulic Design
Matthew McPherson Chief, Water Resources Division USACE	Risk Analysis
Bryan C. Miner Engineer USACE	ATR Civil Design
Patty Smith Real Estate Specialist USACE	ATR Real Estate
Eugene Lenhardt Engineer Buffalo District	ATR Geotechnical
Glen Matlock Cost Estimator USACE	ATR Cost Estimating
Hannah Hadley Environmental Manager USACE	ATR Environmental

CHAPTER 8 – COMPLIANCE WITH APPLICABLE LAWS, POLICIES, AND PLANS

The regulatory requirements discussed below must be met before any of the project alternatives are implemented.

8.1 FEDERAL REQUIREMENTS

8.1.1 National Environmental Policy Act (NEPA)

NEPA (42 U.S.C. § 4321 *et seq.*; 40 CFR 1500.1) applies to any action that requires permits, entitlement, or funding from a Federal agency; is jointly undertaken with a Federal agency; or is proposed on Federal land. NEPA requires every Federal agency to disclose the environmental effects of its actions for public review purposes. NEPA also assists the Federal agency to assess alternatives to and the consequences of the proposed action. NEPA requires that an environmental document be prepared that considers, discloses, and discusses all major points of view on the environmental impacts of the tentatively recommended plan and alternatives.

This portion of the Integrated Feasibility Report/EA/IS is in support of a proposed chevron levee project that would be built by USACE. This document provides the information required by NEPA for the decision-makers to consider the environmental consequences of the no-action and action alternatives. USACE is the lead Federal agency for NEPA for this project.

The draft Feasibility Report/EA/IS will be made available for publication and distribution for a 30-day public review. Full compliance will be achieved when the final Feasibility Report/EA/IS is prepared and a Finding of No Significant Impact (FONSI) is signed.

8.1.2 Federal Endangered Species Act of 1973, as Amended

The Federal Endangered Species Act of 1973 (16 U.S.C. § 1531 *et seq.*, 50 CFR 402.03) requires any Federal agency to consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) before taking any action that may affect a listed species or designated critical habitat. The Federal agency must first avoid an action that may adversely affect a listed species or designated critical habitat. If the Federal action cannot avoid an adverse effect on listed species or designated critical habitat, then the Federal agency must enter into formal Section 7 consultation with USFWS and/or NMFS to identify appropriate measures to avoid, minimize, and compensate for the effect (USFWS 1996).

As part of the Orestimba Creek Feasibility Study, the lead agencies have begun informal consultation in accordance with Section 7 of the Federal Endangered Species Act. USACE determined that the recommended plan and alternatives are not likely to result in adverse impacts to Federally listed species or result in the adverse modification or destruction of critical

habitat. Informal consultation will be initiated following public review of the draft document. Pre-construction surveys would be required to determine the presence or absence of Federally listed species or critical habitat within the construction footprint. If Federally listed species or critical habitat are observed, it is likely that USFWS would require formal consultation through submittal of a Biological Opinion. If Federally listed species or critical habitats are not present, no further consultation would be required.

8.1.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act was authorized on March 19 (16 U.S.C. § 661 *et seq*., 50 CFR 402.06), 1934, to allow State and Federal agencies to work together to protect, rear, stock, and increase the populations of game and fur-bearing species. The Coordination Act was amended in 1946, adding the requirement to consult with USFWS and State fish and wildlife agencies when a Federal project would affect a body of water. The consultation was to prevent the loss or damage to wildlife habitat and resources. The 1958 amendments recognized the importance of wildlife resources to the U.S. and required coordination with other water resource agencies for the purpose of protecting wildlife resources. The amendments expanded the types of water projects that were required to consult with USFWS.

USACE has coordinated with USFWS to develop strategies to minimize temporary construction related impacts and to provide for the long-term enhancement of fish and wildlife habitats. USFWS provided a draft Fish and Wildlife Coordination Act Report in which it recommend implementation of the proposed action. This document is located in Appendix B.

8.1.4 Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act (16 U.S.C. § 470 *et seq*., 36 CFR 800.3) requires a Federal agency to consider the effects of Federal undertakings on historical and archeological resources. Under these requirements, the area of potential effect (APE) of the selected project shall be inventoried and evaluated to identify historical or archeological properties that have been placed on the NRHP and those that the agency and the 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 the SHPO and the ACHP to develop alternatives or mitigation measures and afford the ACHP an opportunity to comment with regard to undertakings that may affect historic properties. The implementing regulation for Section 106 is 36 CFR Part 800 (revised 2001), "Protection of Historic Properties" which requires Federal agencies to initiate Section 106 consultations with the SHPO.

Although pedestrian surveys of the project area were conducted from road crossings, the entire project area has not been systematically surveyed due to a lack of rights-of-entry to potentially affected areas. USACE would enter into a Programmatic Agreement with the SHPO which would require pre-construction surveys, as well as avoidance, minimization and mitigation measures for potential impacts to resources discovered during construction. The PA

would establish guidelines for the mitigation of potentially adverse impacts to cultural resources identified prior to construction.

8.1.5 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 U.S.C. § 4201 *et seq*., 7 CFR 658) was authorized to minimize the unnecessary and irreversible conversion of farmland to nonagricultural use due to Federal projects. This Act protects Prime and Unique farmland, and land of statewide or local importance. The Farmland Protection Policy Act protects forestland, pastureland, cropland, or other land that is not water or urban developed land.

The Farmland Protection Policy Act requires a Federal agency to consider the effects of its action and programs on the Nation's farmlands. This Act is regulated by NRCS. The NRCS is authorized to review Federal projects to see if the project is regulated by the Farmland Protection Policy Act and establish what the farmland conversion impact rating is for a Federal project. USACE is required to provide the NRCS with project maps and descriptions to assess impacts on Prime and Unique farmlands.

In California, NRCS uses a land evaluation and site assessment system (LESA) to establish a farmland conversion impact rating score on proposed sites of Federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. As evaluated using LESA, the permanent impacts on Prime Farmlands resulting from construction of the LPP levee would be considered significant. However, there is no land available for construction of the levee that would avoid impacts on Prime Farmlands, and the levee is necessary for reduction of flood damage risks. Furthermore, the project size has been minimized to the maximum extent possible through project design, and the area of impacts is within Newman's SOI and would be developed within the next 20 years with or without the project. Because the impacts on farmlands are unavoidable and necessary, have been minimized to the maximum extent practicable, and would occur as part of the No Action Alternative, impacts on Prime Farmlands are considered less than significant.

8.1.6 Clean Water Act

Federal and State laws regulate the physical, chemical, and biological characteristics of the Nation's water systems. The Federal Water Pollution Control Act, which is more commonly known as the Clean Water Act (CWA) (33 U.S.C. § 1251 *et seq*., 40 CFR 112), is the Federal law that establishes the baseline that all other State and local water quality laws must meet. The CWA's objectives are to regulate water pollution and water quality so that the Nation's waterways can be restored and maintained. The USEPA is the agency that enforces the CWA. The CWA's first goal is to eliminate all pollution discharge into the Nation's waterways. The second goal is to make all the Nation's waterways safe for all animal and human use. The CWA regulates oceans, lakes, rivers, and any other water systems, water or chemical discharges, and

the action of any Federal agency which could affect these resources. The CWA establishes standards; enforces procedures; and develops regulatory programs, permits, grants, and procedures on other water quality related issues. All State and local laws must meet the standards and regulations established by the CWA.

Section 404 of the CWA regulates the discharge of dredged or fill material into wetlands and waters of the U.S. USACE and USEPA both have responsibilities in administering this program and typically issue permits for these regulated activities after notice and opportunity for public hearings. Individual permits and general permits are issued for activities that may affect wetlands and waters of the U.S. The General permit program, which includes Nationwide permits, is for activities that are similar in nature or that would likely cause minimal environmental effects. Although USACE does not issue itself permits for its own Civil Works projects, USACE regulations state that USACE does have to comply with the intent of the Regulatory permitting process and must apply the guidelines and substantive requirements of Section 404 to its activities. As discussed in Section 4.2.8, a delineation of wetlands and Waters of the U.S. identified four potential jurisdictional wetlands in the upper reach of the study area outside of the footprint for the chevron levee. Alternative 2 would not have any effects on delineated wetlands or Waters of the U.S.

Under the Section 402 of the CWA, it is unlawful to discharge any pollutant into navigable waters, unless a permit is obtained. The California Water Quality Control Board is responsible for administering discharge permits through USEPA-approved NPDES Permit Program, which is also approved for the regulation of Federal facilities (see Section 8.2.3 below). USACE would apply for a NPDES General Construction Permit during the PED phase. Compliance would require development of a SWPPP.

8.1.7 Clean Air Act

The Federal Clean Air Act (16 USC § 470 *et seq*., 40 CFR 51) (Public Law 88-206) was enacted in 1963 to protect public health by regulating the amount of pollutants in the air. The act established primary and secondary National Ambient Air Quality Standards that all states must regulate and maintain. The National Ambient Air Quality Standards include the amount of pollutants allowed in the air based on the sensitivity level of the public. Primary pollution levels are pollution levels safe for sensitive receptors such as children, elderly, and asthmatics. Secondary pollution levels are levels of pollutants safe for the general public.

The Federal Clean Air Act also delegated primary enforcement to the states. In California, CARB has been designated as the responsible agency for all air quality regulation. The State must promulgate rules and regulations that promote the goals of the Federal Clean Air Act and assist in their attainment. The State's rules and regulations must be at least as stringent as the mandated Federal requirements. In states where one or more of the criteria pollutants exceed the National Ambient Air Quality Standards, the state is required to prepare a SIP, which determines how the state intends to meet the standards in a timely manner as

detailed in the Federal Clean Air Act (USACE, 1996). In California, CARB develops and implements the SIP.

In 1990, the Federal Clean Air Act was amended. New criteria were established for non-attainment classifications, emission control requirements, and compliance dates for geographic areas that are in non-attainment for one or more pollutants. In addition, the amended act requires that any Federally-funded project must comply with the air quality standards and regulations that have been established by SIPs.

The USEPA developed the General Conformity Rule, which became effective on January 31, 1994, to implement Section 176c of the Federal Clean Air Act. The underlying principle of the General Conformity Rule is that Federal actions must not cause or contribute to any violation of a National Ambient Air Quality Standards. A conformity determination is required for each pollutant where the total of direct and indirect emissions caused by a Federal action in a non-attainment area exceeds *de minimis* threshold levels listed in the General Conformity Rule (40 CFR 93.153).

Preliminary modeling of air quality impacts resulting from the action alternatives indicates that the project would not violate any standards, increase violations, exceed the *de minimis* thresholds, or hinder the attainment of air quality objectives in the local air basin. USACE would require construction contractors to follow best management practices to reduce the emission of air pollutants. Best management practices would include wetting of disturbed soils, proper maintenance of construction equipment and any further mitigation measure developed through coordination with the Valley Air District (Section 8.2.4 and 8.3.1). Since the proposed alternatives would not exceed *de minimis* thresholds, a Federal conformity determination is not required.

8.1.8 Executive Order 11988, Floodplain Management

To comply with this EO, the policy of USACE is to formulate projects that, to the extent possible, avoid or minimize adverse effects associated with use of the floodplain and avoid inducing development in the floodplain unless there is no practicable alternative. As a flood damage risk reduction project, modification of the floodplain cannot be avoided while achieving project objectives. A number of non-structural measures were evaluated during the Feasibility Phase, which would have reduced flood damages; however, these measures either did not satisfactorily meet planning criteria or were cost prohibitive. The historical floodplain of Orestimba Creek has been substantially altered below the California Aqueduct and no longer provides the natural and beneficial values served by a natural undeveloped floodplain. Existing infrastructure within the floodplain, such as transportation routes, housing, agricultural improvements, levees and drains, limits the potential for restoration of Orestimba Creek's natural hydrology and ecosystem functions. Ecosystem restoration opportunities have been considered throughout the planning stages of the project; however, the project features that involved altering the riparian zones within Orestimba Creek also cost prohibitive. The project

would extend flood damage risk reduction to developed areas within Newman and to agricultural fields in the study area. Newman's General Plan identifies the undeveloped area east of the CCID Main Canal as the location where future growth would be directed. This area is not within the existing 1/100 ACE floodplain. Flood damage risk reduction measures would reduce flooding of agricultural lands east of the Highway 33 and CNRR embankments; however, these areas are protected from development by Williamson Act contracts with the state.

Through implementation of the NEPA process, consideration of measures which would avoid adverse impacts to floodplains, minimization of impacts on the human environment resulting from flooding, and restoration of floodplain functions where possible, the Proposed Action is in compliance with EO 11988, Protection of Floodplains.

8.1.9 Executive Order 11990, Protection of Wetlands

EO 11990, Protection of Wetlands, 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 when implementing Civil Works projects.

As part of the Feasibility Study, a full range of measures and alternatives to achieve flood damage risk reduction were developed and assessed. An alternative involving modifications to the Orestimba Creek channel was determined to be cost prohibitive due in part to the effects to the existing wetlands associated with the creek. As discussed in Section 4.2.8, a delineation of wetlands and Waters of the U.S. identified four potential jurisdictional wetlands in the upper reach of the study area outside of the footprint for the chevron levee. Alternative 2 would not have any effects on delineated wetlands or Waters of the U.S. Therefore, the proposed action is in compliance with EO 11990, Protection of Wetlands.

8.1.10 Executive Order 12898, Environmental Justice

EO 12898, Environmental Justice, requires that environmental analyses of proposed Federal actions address any disproportionately high adverse human health or environmental effects on minority or low-income communities. Federal agencies' responsibility under this order shall also apply equally to Native American populations. In addition, each Federal agency must ensure that public documents, notices, and hearings are readily accessible to the public.

No disproportionately high or adverse human health or environmental effects on minority or low-income communities have been identified. Impacts of the project alternatives would affect the farming community and those economically linked to the farming community equally. Mailing notices and distribution of other project information includes property owners and potentially affected persons and institutions without any distinction based on minority or income status. The local farming community has been invited to all public meetings and their representatives have attended plan formulation meetings to ensure input into the planning

process. The Environmental Justice Compliance is also discussed under Socio-economics in Chapter 5.

8.1.11 Noxious Weed Act of 1974

The Noxious Weed Act (7 U.S.C. § 2801 *et seq*.) was authorized to control and manage the spread of nonnative plant species that may have adverse affect on agriculture, commerce, wildlife resources, or public health.. The Noxious Weed Act inhibits the transport, trade, or sales of noxious plant species in the U.S. The Noxious Weed Act gave the Secretary of Agriculture the authority to determine which plant species are noxious plant species and to establish measures to control them. As amended, the Noxious Weed Act requires all Federal agencies to establish a management plan to control the spread of noxious plant species in their jurisdiction. A management plan would be developed for the construction phase of this project and would be include in the Operations and Maintenance Manual for the project.

8.1.12 Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act (16 U.S.C. § 703 *et seq*.) formed an agreement between Canada, Japan, Mexico, and Russia to protect migratory birds (Department of Energy Environmental Policy and Guidance 2001). The Migratory Bird Treaty Act establishes treaties and conventions to establish policies and management approaches to protect the migratory birds that migrate between the participating countries (Alaska USFWS 2003). The Migratory Bird Treaty Act regulates the trapping, capturing, killing, transportation, trade, or sales of migratory birds, their eggs, parts, and nests. The Migratory Bird Treaty Act is regulated and enforced by the Department of the Interior. Section 704 of the Migratory Bird Treaty Act gives the Secretary of the Interior the authority to determine the management measure required to ensure that take is compatible with the protection of migratory bird species according to distribution and population in the U.S. (Department of Energy Environmental Policy and Guidance 2001). Migratory birds and their nests are likely to occur within the footprint of proposed construction. If possible, construction activities would be scheduled to occur outside of the nesting season. If construction in potentially suitable habitats must occur during the nesting season, pre-construction surveys would be required to determine the presence of migratory birds or nests. If nests are identified, mitigation measures to minimize impacts would be required. If nests are identified, the area would be avoided until the end of the nesting season.

8.1.13 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act)

The Magnuson-Stevens Act (16 U.S.C. § 1801 *et seq*.) was passed by Congress in 1976, and gave NMFS the authority to regulate fisheries in the U.S. The area of authority covers a range of 3 nautical miles from the land edge to 200 nautical miles out to sea. This area of authority is called the Exclusive Economic Zone. The goals of the Magnuson-Stevens Act were to phase out foreign fishing operations in the Exclusive Economic Zone, prevent overfishing, allow overfished species to recover, and protect and manage fishery resources. The project alternatives would not affect fisheries in the Exclusive Economic Zone.

The Magnuson-Stevens Act was amended in 1996, to place the focus on sustainability of fisheries resources, habitat conservation, and the standard for maximum sustainable levels for fisheries. Under the 1996 amendments, Federal agencies are mandated to consult with NMFS regarding any action authorized, funded, or undertaken that may adversely affect any EFH designated under the Magnuson-Stevens Act. EFH is habitat that is essential for the spawning, foraging, breeding, and growth of aquatic species. The San Joaquin River watershed below the Merced River is designated EFH for Chinook salmon (Pacific Fishery Management Council 1999). EFH for the Pacific coast salmon fishery is defined as those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem and includes streams, lakes, ponds, wetlands, and other currently viable water bodies, as well as most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. As described in the assessment of water quality impacts, chevron levees would reduce the exposure of overland floodflows to pollutants and improve water quality. Improved water quality would increase suitability of aquatic habitats, including EFH, in the San Joaquin River and have a beneficial impact on local populations of fish and other aquatic wildlife.

8.1.14 Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act

The Americans with Disabilities Act of 1991 (42 U.S.C. § 12101 *et seq*.), the Rehabilitation Act (Public Law 93-112), and the Architectural Barriers Act (42 U.S.C. § 4151 *et seq*.) Title II, require projects administered by State and local governments to provide program accessibility to persons with disabilities as long as providing accessibility would not fundamentally change the purpose of the project. Section 504 of the Rehabilitation Act requires program accessibility for persons with disabilities to any program or activity receiving Federal financial assistance. The Architectural Barriers Act requires accessibility for persons with disabilities to Federally-financed facilities constructed or altered on behalf of the U.S. The future location of alternative transportation corridors, such as the proposed bicycle route along the CCID would be considered during the PED phase, and all necessary accessibility features would be incorporated into project design.

8.1.18 Noise Control Act of 1972

Congress passed the Noise Control Act (42 U.S.C. § 4909 *et seq*.) on October 27, 1972, to protect the quality of human life from adverse affects from noise. The Noise Control Act requires Federal agencies activities that may produce noise to comply with all Federal, State, and local laws and regulations that regulate noise levels. The Stanislaus County General Plan identifies noise emissions thresholds, which were incorporated into the significance thresholds used in the assessment of impacts resulting from the project. Construction related noise is not likely to exceed land use compatibility thresholds on agricultural lands, but could result in intermittent noise impacts to residential uses within 700 feet of construction activities. No staging areas would be located near residential properties, sensitive wildlife habitats, or other noise sensitive uses. Truck routes and detours would consider potential impacts to adjacent properties. Night-time construction would be restricted near noise sensitive land uses. All construction equipment would be properly maintained. The proposed levee alignment would affect lands zoned for residential use, and additional mitigation such as the construction of temporary sound barriers or sound-proofing of homes could be required.

8.2 STATE REQUIREMENTS

8.2.1 California Environmental Quality Act (CEQA)

CEQA applies to an action that is directly undertaken by a California public agency; is supported in whole or part by California public agency contracts, grants, subsidies, loans, or other assistance for a public agency; or involves the issuance by a California public agency of a permit, lease, license, certificate, or other entitlement for use by a public agency. CEQA requires State, regional, and local agencies to prepare environmental documents assessing the significant environmental impacts of the tentatively recommended plan, to circulate these documents to other agencies and the public for comment, and to consider comments in their decision-making.

The CEQA lead agency for this project is Stanislaus County. This Feasibility Report/EA/IS has been prepared jointly with the Federal lead agencies to meet CEQA requirements. Upon certifying the document, the CEQA lead agencies would adopt a reporting or monitoring program for the changes made to the project or the conditions of project approval to mitigate or avoid significant effects on the environment. The draft Feasibility Report/EA/IS constitutes partial compliance with CEQA. Full compliance would be achieved when the final Feasibility Report/EA/IS and Notice of Determination is submitted to the Office of Planning and Research.

8.2.2 California Endangered Species Act

Compliance with the California Fish and Game Code is required if a species listed as a candidate, threatened, or endangered under the California Endangered Species Act may be present in the project area and a Stanislaus County is acting as lead agency for CEQA compliance (Section 2090) or if the action may result in the “take” of a species listed under

California Endangered Species Act (Section 2081). Section 2081 of the California Fish and Game Code allows CDFG to issue incidental take permits for the take of State-listed threatened and endangered species. Take includes hunting, pursuing, catching, capturing, or killing, or attempting such activity.

This act requires that non-Federal lead agencies include within their CEQA documentation, an assessment of project effects on State-listed species. The lead agencies have completed a search of the CNDDB in 2011 to identify State-listed threatened and endangered species that have been recorded in the study area. Although there were limited records of state listed species occurring within construction footprints, numerous State-listed species have been observed throughout Stanislaus County, and many records are associated with Orestimba Creek upstream of the Delta-Mendota Canal. Proposed measures to avoid and mitigate potential impacts to State-listed species include pre-construction surveys and avoidance of areas actively used by State-listed species. Proposed construction measures would not jeopardize the continued existence of any State-listed species or result in the substantial destruction or adverse modification of habitat essential to the continued existence of the species. However, loss or degradation of essential habitat may be considered take, even if listed species are not proven to use the area. Further coordination with CDFG would determine the need for an incidental take permit and the development of additional mitigation measures if necessary.

The Natural Community Conservation Planning Act was added to the California Endangered Species Act in 1991. The purpose of the Natural Community Conservation Planning Act is to preserve species and their habitat while allowing for reasonable development to continue. The Natural Community Conservation Planning Act encourages cooperation between CDFG, landowners, and other interested parties to develop natural community cooperation plans. The natural community cooperation plans allow for early coordination to protect species and their habitats not currently listed (California Resources Agency, 2003). There are currently no habitat conservation plans that encompass the city of Newman or Orestimba Creek.

8.2.3 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act was enacted in 1969 *(California Water Code, Division 7, Water Quality)* to preserve, enhance and restore the quality of the State's water resources. The Porter-Cologne Water Quality Control Act established policy and standards for both surface and ground water and regulates the discharge of pollutants from both point and non-point sources. Although this act was passed prior to the Federal CWA, the CWA designates state agencies as responsible for establishing water quality standards and the state law does not supersede the federal law. The State Regional Water Quality Control Boards (WQCBs) are the agencies responsible for administering California's water quality standards.

Under Section 303(d) of the Federal CWA, the CVRWQCB has developed a Water Quality Control Plan (CVRWQCB, 2007) and maintains a list of water quality limited segments

(CVRWQCB, 2009). Waters on the 303(d) list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The Federal CWA requires that jurisdictions establish priority rankings for waters on the 303(d) list and develop action plans, incorporating TMDLs, to improve water quality. California Water Code section 13240 authorizes the CVRWQCB to formulate and adopt Basin Plans for all areas within their region. The Basin Plan is the basis for Section 401 state water quality certifications and issuance of section 402 NPDES permits.

The CVRWQCB list of Water Quality Limited Segments, also called the 303(d) list, in the study area includes both monitored segments of Orestimba Creek and the San Joaquin River from the Merced River to the Tuolumne River. Beneficial use of both segments of Orestimba Creek is impaired by high levels of agricultural pollutants including: Azinphos-methyl, Chlorpyrifos, DDE, and Diazinon. The segment below Kilburn Road is also impaired by sediment toxicity of unknown origin and by an unknown toxicity of agricultural origin. Beneficial use of the San Joaquin River is impaired by high levels of agricultural pollutants including Chlorpyrifos, DDT, and group A pesticides, and is also impaired by high levels of mercury.

In 1992, the State WQCB adopted a statewide general NPDES permit (Order No. 92-08-DWQ, General Permit No. CAS000002), which applies to construction projects resulting in land disturbance of 5 acres or greater. In order to obtain a statewide NPDES general construction permit, an action must comply with the CVRWQCBs Water Quality Control Plan for the Sacramento and San Joaquin River Basins, the Central Valley Pesticide TMDL and Basin Plan Amendment, San Joaquin River Organophosphorus Pesticide TMDL, San Joaquin River Dissolved Oxygen TMDL, and the San Joaquin River Upstream Salinity and Boron TMDL. Prior to construction, the County would obtain a NPDES general construction permit. Conditions of the permit would require development and implementation of a storm water pollution prevention plan to limit effluent discharge as a result of storm water runoff and performance of inspections of storm water pollution prevention measures during and after construction.

8.2.4 California Clean Air Act

In 1988, California passed the California Clean Air Act, which parallels the Federal Clean Air Act and calls for the designation of areas of attainment or non-attainment to State Ambient Air Quality Standards. The act established the State's standards and authority to regulate air quality issues. CARB is the State agency responsible for regulating air quality. CARB has established California Ambient Air Quality Standards, applicable within California, for all Federal criteria pollutants as well as sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles (Table 8-1). The California Clean Air Act requires each Air Pollution Control District in California to adopt strategies for achieving California Ambient Air Quality Standards by the earliest practicable date.

Table 8-1: State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard

Pollutant	Averaging Time	California Standard (parts per million)
Ozone	8-Hour	0.07
	1-Hour	0.09
Carbon Monoxide	8-Hour	9.00
	1-Hour	20.00
Nitrogen Dioxide	Annual	0.03
	1-Hour	0.18
Sulfur Dioxide	24-Hour	0.04
	1-Hour	0.25
		(micrograms per cubic meter)
PM-10	Annual	20.0
	24-Hour	50.0
PM-2.5	Annual	12.0
Lead	30-day	1.5

Source: CARB, 2008b

The State is divided into 15 air quality basins based on meteorological and geographic features. These air basins are then divided into 35 air districts that address local air pollution issues. Each district has primary responsibility for attainment and maintenance of air quality standards within their jurisdictional boundaries. Local air districts develop plans and programs to maintain clean air that is within the air quality standards of Federal and State laws, and are responsible for enforcing standards and regulating stationary sources. Additional detail is provided below in section 8.3.1.

8.2.5 California Global Warming Solutions Act

California Assembly Bill 32, the California Global Warming Solutions Act of 2006, identifies California as a substantial source of GHG emissions and requires a significant reduction in these emissions. GHG emissions levels are required to be reduced to 2000 levels by 2010, to 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The emissions reduction is expected to be achieved through the continuation of existing state policies, and through the enforcement of a statewide GHG emissions limit to be incorporated starting in 2012.

Existing policies aimed at limiting GHG emissions include Assembly Bill 1493, which requires CARB to define standards for cars and light trucks manufactured after 2009 and is projected to result in an 18 percent reduction in emissions. In addition, SB 97, enacted in 2007, requires that the CEQA guidelines be amended to incorporate analysis and mitigation of GHG

emissions in CEQA documents. The Natural Resources Agency adopted the CEQA Guideline Amendments on December 30, 2009 under §15064.4.

The action alternatives would result in a temporary increase in GHG emissions as a result of project-related construction. The project could result in minor traffic delays during construction. Additional analysis of staging area location, truck routes, and detours would be conducted during the PED phase to minimize potential impacts on local traffic. The project would not permanently increase travel times through the affected areas. Flood risk reduction would primarily be extended to currently developed areas, agricultural lands protected by Williamson Act contracts, or areas not currently affected by the 1/100 ACE storm event. The project would not induce future development, or otherwise result in a long-term, indirect increase in vehicle related GHG emissions.

8.2.6 Central Valley Flood Protection Board Encroachment Permit

Under California law, no reclamation project of any kind may be started or carried out on or near the Sacramento and San Joaquin Rivers or their tributaries until plans have first been approved by CVFPB. The CVFPB's efforts focus on controlling floodwater; reducing flood damage; protecting land from floodwater erosion that would affect project levees; and controlling encroachment into flood plains and onto flood-control works, such as levees, channels, and pumping plants. Proposed measures would result in beneficial impacts by reducing flood damage risk and would not promote indirect development within the floodplain or onto flood control works.

Banks, levees, and channels of floodways along any stream, its tributaries, or distributaries may not be excavated, cut, filled, obstructed, or left to remain excavated during the flood season. The flood season for the San Joaquin River is November 1 through July 15. The CVFPB, at the prior written request of USACE, Sacramento District, may allow work to be done during flood season within the floodway, provided that, in the judgment of the CVFPB, forecasts for weather and river conditions are favorable.

Levees constructed, reconstructed, raised, enlarged, or modified within a floodway shall be designed and constructed in accordance with the USACE manual, "Design and Construction of Levees" (EM 1110-2-1913). Evaluation of levee embankment and foundation stability and a detailed settlement analysis must be conducted to ensure long-term stability during full flood stage. Additional standards for levee construction, including easement conditions, are provided in Title 23, Code of California Regulations, Division 1, Article 8, Section 120, Levees.

8.2.7 California Wild and Scenic Rivers Act of 1972

The purpose of this act is to preserve and protect wild and scenic rivers and their immediate environments for the benefit of present and future generations. The legislature must approve any action that would affect a designated river. The primary difference between

this act and the Federal act is that the Federal Energy Regulating Committee may issue a license to build a dam on a state-listed river, thus overriding the State statute. Neither Orestimba Creek nor the San Joaquin River is designated as a California Wild and Scenic River (California Public Resources Code Section 5093.50 *et seq.*).

8.2.8 Title 24 of the California Code of Regulations: California Building Code

The California Building Standards Commission (BSC) is an independent commission within the State and Consumer Services Agency that codifies and publishes approved building standards in one state building standards code (California Code of Regulations, Title 24). The California BSC provides guidance to architects, engineers, insurance companies, etc., when making decisions about the building industry. The BSC ensures that the California building codes effectively address areas such as health, fire and panic safety, employee safety, energy conservation, and handicapped accessibility. The BSC determines if such codes and standards are in the public interest. Construction standards for levees are found within the California Code of Regulations. Additional analysis and design would be required during the PED phase.

8.2.9 Williamson Act and Farmland Security Zone Act

The Williamson Act and the Farmland Security Zone Act reduce property taxes on qualifying agricultural land in exchange for a commitment from the landowner not to develop the land with uses other than those compatible with and supportive of agriculture. The Williamson Act creates an arrangement whereby private landowners contract with counties and cities to voluntarily restrict land to agricultural and open-space uses. This arrangement is a 10-year contract during which time the restricted parcels are assessed at a lower tax rate. The Farmland Security Zone Act is a 20-year contract. These contracts renew automatically each year. In order to terminate the contract, a landowner must file a notice of non-renewal that starts a 9-year process for contract termination. The contract may be canceled to avoid the 9-year termination process, but is subject to a 12.5 percent fee based on the assessed value of the property.

As noted in Section 5.2.15, within Newman's Planning Area and outside the SOI, lands held under Williamson Act Contracts occur on the flood side of the levee and would not be affected by the proposed project. The majority of lands within the area of flood damage risk reduction, especially within the Primary SOI and SOI, are not held under Williamson Act contracts or are held under Williamson Act contracts set to expire by 2014. Lands directly converted to non-agricultural use as a result of constructing the chevron levee are currently planned for development as residential areas within the next 20 years.

8.2.10 California Department of Pesticide Regulation

In an effort to address pesticide related impairments and their effects, the California Department of Pesticide Regulation (CDPR) has developed a water monitoring program which encompasses Orestimba and Del Puerto Creeks (Ensminger 2007). In 1991, the State Water Resources Control Board signed a Memorandum of Agency Agreement with the CDPR to ensure that pesticides registered for use in California are used in a manner that protects water quality and the beneficial uses of water, while recognizing the need for pest control. This agreement was revised in 1997 to facilitate implementation of the original agreement. The use of pesticides to control noxious weeds in the study area would be conducted according to product labels and would be coordinated through the 401 State Water Quality Certification and NPDES General Permit application process.

8.2.11 California Food and Agriculture Code

The California Department of Food and Agriculture lists 171 plants as noxious weeds (CDFA, 2008). A noxious weed is defined as any plant species that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate (California Food and Agricultural Code Section 5004). Any area which is infected with any pest, including noxious weeds, is considered a public nuisance, and it is unlawful for any persons to maintain and should be abated (California Food and Agriculture Code Sections 5401-5403). Noxious weeds were identified within the construction footprint and along adjacent agricultural margins. In order to control post-construction establishment of noxious weeds on disturbed soils, a noxious weed control plan would be incorporated into the construction plans. Noxious weeds would be controlled within the construction area until native plants are established and conditions are unfavorable for the establishment of noxious weeds.

8.3 LOCAL PLANS AND POLICIES

8.3.1 Air Pollution Control Districts

California has 35 local air pollution control districts throughout the state (CARB, 2009). Each district is responsible for establishing and enforcing air pollution regulations in order to attain and maintain all State and Federal ambient air quality standards. These districts permit stationary sources of air pollution and implement transportation control measures for their respective regions. In order to combat particular air quality problems within its region, each district adopts its own rules and regulation, as the types of sources of air emissions vary from district to district. Stanislaus County is within the Valley Air District. The Valley Air District is made up of eight counties in California's central valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the valley portion of Kern. Federal and state laws require emission control measures in areas where air pollution exceeds standards. The San Joaquin Valley is one of these areas. The Valley Air District has developed air pollution control measures under three CARB-approved Air Quality Plans: the Extreme Ozone Attainment

Demonstration Plan, the Carbon Monoxide Maintenance Plan, and a PM_{10} Maintenance Plan. The tentatively recommended plan would comply with all control measures to mitigate impacts to air quality to less than significant, including minimization of the construction footprint, wetting of soils, and proper maintenance of construction equipment.

8.3.2 Public Works and Transportation Departments

An encroachment permit must be obtained when encroachments are proposed within, under, or over a county or city road, or cover rights-of-way. The non-Federal sponsor would consult the appropriate local agencies to obtain the encroachment permits once the project has been authorized. Conditions of the encroachment permit would include measures to ensure public safety and the acceptable flow of traffic.

8.3.3 Mosquito Abatement District

The Stanislaus County Mosquito and Vector Control District is responsible for conducting mosquito abatement and vector control in Stanislaus County. In addition, Stanislaus County maintains a Mosquito Surveillance Task Force. Both of these organizations serve under the County Board of Supervisors. Stanislaus County is the local sponsor and would determine if there is any additional needed mosquito abatement by the tentatively recommended plan.

8.3.4 Stanislaus County General Plan

Section 65300 of the California Government Code states that "Each planning agency shall prepare and the legislative body of each county and city shall adopt a comprehensive, long-term general plan for the physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning." The general plan is to consist of seven mandatory elements and as many optional elements as the local jurisdiction deems desirable. The mandatory elements include land use, circulation, housing, open space, conservation, safety, and noise. The Stanislaus County has also adopted one optional element, the agricultural element, as much of the county is used for agricultural purposes.

The County General Plan sets goals for management of each element and establishes policies and regulations for the accomplishment of these goals or to prevent implementation of conflicting actions. The policies and regulations established by the County General Plan were incorporated into significance thresholds where applicable. The tentatively recommended plan, including proposed mitigation measures, would comply with or enhance the achievement of the policies and regulations established by the County General Plan.

CHAPTER 9 – TENTATIVELY RECOMMENDED PLAN

This chapter describes the tentatively recommended plan, as well as the procedures and cost sharing required to implement the plan. A schedule and a list of further studies are also included.

9.1 TENTATIVELY RECOMENDED PLAN (TRP)

The plan identified as the TRP is the chevron levee with 3 feet of freeboard (Figure 9-1). The TRP is the LPP; however, Federal cost sharing would be capped at 65% of the NED plan. This plan is justified and has a benefit to cost ratio of 1.34. This plan allows the local community to meet both FEMA certification requirements and the State of California's criteria for the funding of flood risk management projects. A policy exception waiver from the ASA(CW) has been granted to allow the Federal government to recommend the LPP over the NED plan. This policy exception was determined to be warranted in order for the community to meet FEMA and State of California requirements.

The TRP is described in detail below.

9.1.1 Features and Accomplishments

The principle feature of the TRP is the construction of approximately 4 miles of levee along the east bank of the CCID Main Canal and a 1 mile cross-levee to reduce the flood risk to the city of Newman and adjacent agricultural areas.

The TRP includes the same elements as the NED plan, but raises the height of the chevron levee to include 3 feet of freeboard above the mean 0.5% WSEL. This freeboard was requested by the local sponsor in order to meet State of California requirements for an urban area which is identified as the 1/200 year median WSEL plus 3 feet of freeboard. The freeboard for the 0.5% (1/200) ACE may be reduced to 2 feet during PED if 95% assurance can be demonstrated in the final design.

Pursuant to 44 CFR, Part 65.10, FEMA requires a levee to be either: a) 3 feet above the median 1% WSEL with a 90% assurance for the 1% event or b) 2 feet above the median 1% WSEL with 95 % assurance for the 1% event. The NED levee is about 1.5 feet shorter than these criteria; however, the LPP achieves it. The State of California requires urban and urbanizing areas (with a population of 10,000 or greater) to achieve 200 year level of protection in order to qualify for State funding of flood risk management projects. The State's interim levee design guidelines require 3 feet of freeboard above the median 1/200 ACE WSEL or higher if required for wind setup and wave run up. It was determined that additional freeboard to account for wind waves would not be required. The proposed chevron levee alignment would be sheltered from wind waves by the existing CCID Main Canal berm. Analysis of the Lundy road segment indicated the wave height plus setup would be less than 3 feet at the 1/200 ACE median water surface elevation.

There is basically no quantifiable difference between the economic benefits attributed to the NED and the LPP; however, the LPP would allow the sponsor to meet State of California requirements as well as FEMA accreditation requirements.

The difference between the mean 1% and the .5% (the 100 year and 200 year) WSEL is only several inches due to the nature of alluvial fan flooding, which is broad and shallow. Changes in topography could alter the flow path in many different directions, although not to the extent that flood risk could be reduced for the City of Newman.

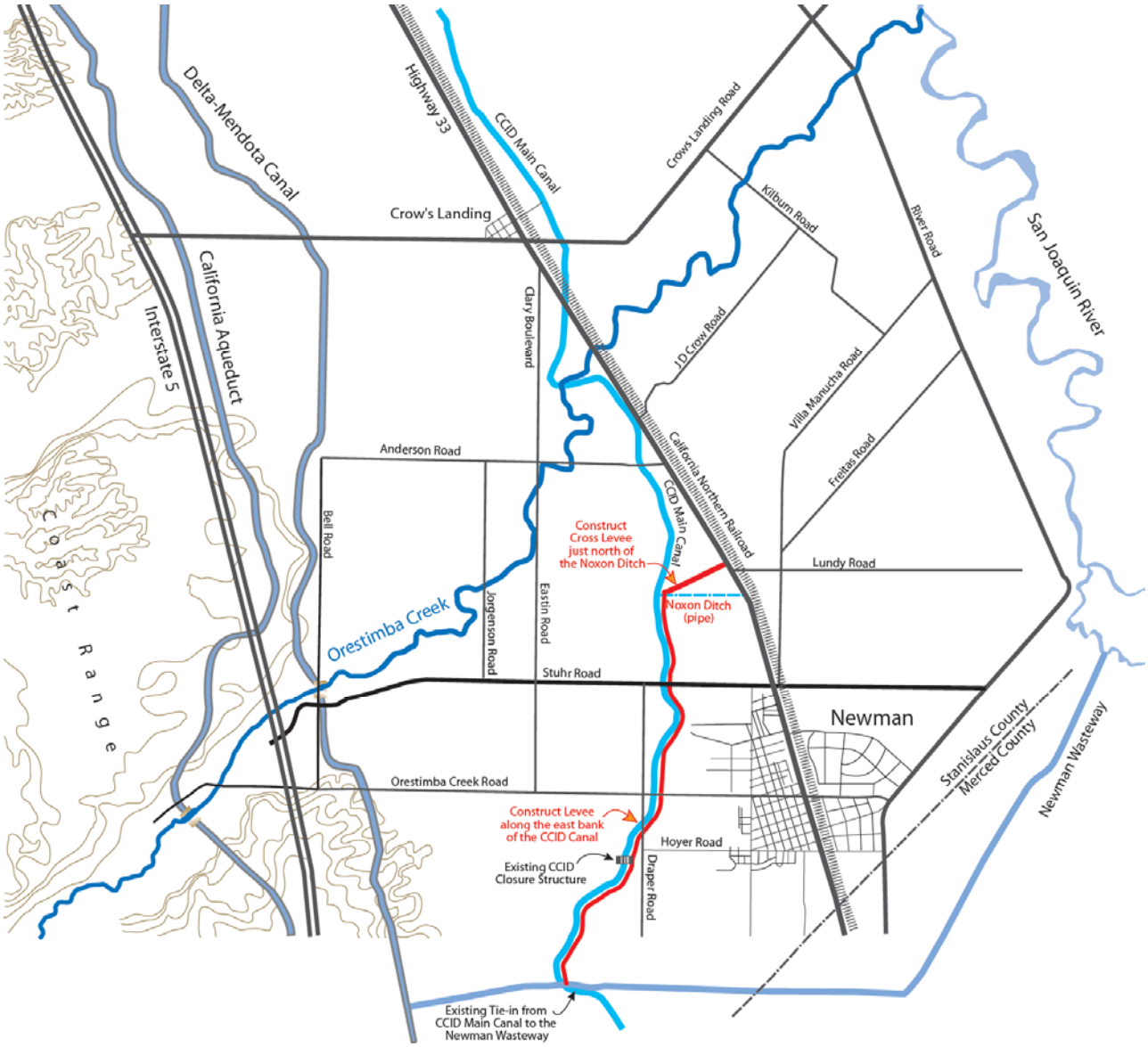


Figure 9-1: Tentatively Recommended Plan

Construction of the chevron levee would alter the nature of the existing floodplain by slightly increasing the depth and extent of flooding to the north of the proposed levee. Floodflows may pond in this area as the flows are metered through culverts under Highway 33 and the CNRR berm.

As stated above, the chevron levee would be constructed parallel to the east bank of the CCID Main Canal. Starting at the Newman Wasteway, the levee would continue north to a location near Lundy Road, at which point the levee alignment would angle diagonally away from the canal toward the northeast for another 0.7 miles to tie in to the CNRR embankment near an existing culvert. This existing culvert would function to reduce the frequency and duration of floodwater ponding on the north side of the levee. The levee would also extend an additional 35 feet east of the CNRR embankment to insure that floodwaters do not flank the proposed levee. The levee would be approximately 4.7 miles in total length.

The proposed levee is higher than roadway elevations at four crossing locations, and a gap in the top portion of the levee is required to meet highway vertical curve safety standards. A slotted abutment would be constructed in the levee on each side of these roadways. During a flood event, stop logs would be placed into the slotted abutments across the roadways. When installed, the stop log structure would be approximately 1 to 3 feet high (0.5-2 feet for NED plan) and would prevent floodwaters from flowing through the gap (Appendix C-3, Attachment A, Plate 20). This would not interfere with traffic because the roadway to the west of the structure would be flooded when the stop logs were in place. The stop-log closure structures would be located at four locations where existing roads cross the proposed levee alignment. These road crossings include Shells Road, Draper Road, Orestimba Creek Road, and Stuhr Road. Operation of these closure structures is critical to achieving the intended project performance. Failure to operate these closure structures could result in erosion and failure of the levee embankment.

Another gate closure would be constructed where the levee crosses the CNRR railroad embankment. The proposed levee is higher than the railway and a gap in the top portion of the levee is required to prevent interference with the levee grade. The levee grade cannot be changed because the height of the levee segment is dependent on floodwaters overtopping this grade. An abutment would be constructed in the levee on each side of the railway. During a flood event, floodgates hinged on the abutment would be closed across the railway. When installed, the swing gate structure would be approximately 2 to 3 feet high and would prevent floodwaters from flowing through the gap (Appendix C-3, Attachment A, Plate 21). This would not interfere with railway traffic because the railway north of the levee would be flooded when the swing gate structure was in place. Operation of these closure structures is critical to achieving the intended project performance. Failure to operate these closure structures could result in erosion and failure of the levee embankment.

Where the levee crosses State Highway 33, the highway would be raised to meet levee design elevations (Appendix C-3, Attachment A, Plate 12). Highway 33 would be raised over an additional 2000 foot length to account for longer vertical curves necessary to go over the higher levee.

Another component of the levee is a seepage berm. Geotechnical analysis shows a thin clay blanket with high exit gradient from station 106+00 to 164+00. Levee seepage could threaten levee stability in this area. A seepage berm needs to be constructed along the landside levee toe from station 106+00 to 164+00 (Plate 8, 9, and 19 in Attachment A).

The proposed LPP would also include a railroad embankment protection plan (Plates 12,13,14,15 and 19 in Appendix C-3, Civil Design). During small flood events and localized rainfall events, Orestimba Creek floodwater or local runoff would be conveyed to the east side of the railroad embankment through existing drainage culverts. However, the railroad would be overtopped during a large flood event. To mitigate for this condition, the east side of the railroad embankment would require a sand filter and be lined with rock revetment to prevent erosion. Approximately 10 culverts under the CNRR embankment would be extended to accommodate the seepage embankment and erosion protection. New upstream and downstream headwalls would be constructed at each culvert. The railroad embankment protection plan begins where the proposed levee crosses the railroad and ends where the railroad crosses Orestimba Creek. The distance is approximately 2 miles.

The borrow source for the levee construction has been identified as the Fink Road landfill. This is a regional land fill site owned and operated by Stanislaus County, the non-Federal sponsor. This landfill has also been identified as the disposal site for material determined unsuitable for levee construction. The distance from the Fink Road landfill to the construction site is about 12 miles.

9.1.2 Operation, Maintenance, Repair, Replacement, and Rehabilitation

Once project construction is complete, the project would be turned over to the non-Federal sponsor. The non-Federal sponsor would then be responsible for the operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project in accordance with the OMRR&R manual. Operation and maintenance (O&M) requirements would include maintenance of the project levees and periodic operation of roadway and railroad closure structures. The annual cost for O&M of the tentatively recommended plan is estimated to be about $100,000. Floodwaters are assumed to reach the levee and associated features at the 1/10 ACE. Additional detail on the OMRR&R can be found in the Civil Design Appendix (Appendix C-3). Some of the additional requirements and assumptions for O& M are listed below:

- Caltrans will take full responsibility to repair flood water caused erosion of the embankment along Highway 33 in the study area.
- The existing culverts under Highway 33 and the CNRR Railroad would continue to operate, and the government will not be responsible for any culvert maintenance cost.
- CCID will allow residual floodwaters to be discharged into their canal following any overtopping failure of the canal. The Sponsor will be required to maintain and use portable pumps for this purpose.
- After construction CCID will obtain Section 408 approvals for any modification to the project including any modification necessary to meet irrigation delivery objectives.

- The sponsor will insure stop log structures and flood gates are tested and are fully operational.
- CCID and CNRR will maintain their embankment height to be no higher than the existing conditions from the north end of the proposed levee for a distance of two miles.

9.1.3 Real Estate

Acquisition of about 90 acres in fee title along with about 90 acres of temporary work easements would be required for the tentatively recommended plan. The non-Federal sponsor would acquire these lands as part of the project.

Real estate acquisition for the recommended plan is split among 23 landowners with the majority of the land owned by the CCID. Relocations are estimated to be about $6,000,000, which would consist of ramping Highway 33 and the CNRR over the new levee, and relocating affected utilities and irrigation ditches.

9.1.4 Plan Economics and Cost Sharing

The project first cost, estimated on the basis of October 2011 price levels, amounts to $44,000,000. Table 9-1 displays each cost by project feature. Estimated average annual costs were based on a 4 percent interest rate, a period of analysis of 50 years, and construction ending in 2017. Table 9-2 shows the project first costs and benefits. The total average annual flood damage reduction benefits are $3,128,000.

TABLE 9-1: Estimated Costs of Recommended Plan[1] ($1,000)

MCACES Account[2]	Description	Total First Cost
01	Lands and Damages[3]	2,700,000
02	Relocations[4]	6,000,000
11	Levees	26,500,000
18	Cultural Resources[7]	300,000
30	Preconstruction, Engineering, Design[8]	5,800,000
31	Construction Management[9]	2,800,000
	Total First Cost[10]	44,000,000

Notes:
[1]Based on October 2011 price levels, 4 percent rate of interest, and a 50-year period of analysis.
[2]Micro Computer-Aided Cost Engineering System (MCACES) is the software program and associated format used by USACE in developing cost estimates. Costs are divided into various categories identified as "accounts." Detailed costs estimates are presented in Appendix C, part 4, Cost Engineering.
[3]Real Estate land costs, which include no damages.
[4]Relocations include ramping Highway 33, a closure structure across the CNRR, and relocating affected utilities and irrigation ditches.
[7]Assumes approximately 0.4 percent of project first cost.

[8]12 percent of 02, 06, 11, and 18 accounts. PED is cost shared 75 percent Federal and 25 percent non-Federal during PED, then adjusted as part of the total project cost sharing to 65 percent Federal and 35 percent non-Federal during construction.
[9]8.5 percent of 02, 11, and 18 accounts.
[10] Numbers reported may be slightly different that those presented in the appendices due to rounding.

The estimated total project first cost for the tentatively recommended plan is $44,000,000. Federal costs are capped at 65% of the NED plan which is estimated to have a first cost of $35,200,000. Cultural Resource Preservation costs of $350,000 would be added as part of the Federal costs. A summary of cost sharing responsibilities is presented in Table 9-2.

TABLE 9-2: Summary of Cost Sharing Responsibilities for the Tentatively Recommended Plan[1]

Item	Federal[2]	Non-Federal
Flood Risk Management	22,880,000	21,100,000
Cultural Resource Preservation	350,000	
Total	23,230,000	21,100,000
Breakdown of Non-Federal		
LERRDs[3]		8,700,000
5% Cash Requirement		2,200,000
Remaining Cash		10,200,000
Total		21,100,000

Notes:
[1] Based on October 2011 price levels, 4 percent rate of interest, and a 50-year period of analysis.
[2]Federal Project First Costs are based on 65% of the NED Plan of $35.2 million.
[3] Non-Federal interests must provide all LERRDs and a minimum cash contribution of 5% of the total project cost.

9.1.5 Risk and Uncertainty

In general, the ability of the plan to provide the expected accomplishments depends on the following: the validity of pertinent assumptions, base data, and analytical techniques used in this study; and the successful completion of future studies, designs, and construction; and appropriate OMRR&R after construction.

Risks to the project performance from a hydraulic standpoint would be reduced by the additional 3 feet of freeboard that would be added to the mean 1/200 ACE water surface for the TRP. Compared to the NED plan, the additional freeboard reduces the chances of levee overtopping during the period of analysis resulting from:

- Changes to the floodplain topography caused by the common use of agricultural land leveling in the central valley;

- Failure of local (non-project) levees along the Orestimba Creek channel resulting in different flow paths along the project levee;
- Failure of the CCID Main Canal embankment in the canal reach north of the project resulting in different flow paths along the project levee;
- Possible increased CCID Main Canal embankment height in the canal reach resulting in different flow paths along the project levee; and
- Normal maintenance practices by the CNRR may increase the railroad embankment height in the segment north of the project. The increased height would result in the increased probability of higher stages on the water side of the levee.

9.1.6 Executive Order 11988

EO 11988 requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities."

The Water Resources Council Floodplain Management Guidelines for implementation of EO 11988, as referenced in USACE ER 1165-2-26, require an eight-step process that agencies should carry out as part of their decision-making on projects that have potential impacts to or within the floodplain. The eight steps reflect the decision-making process required in Section 2(a) of the EO. The eight steps and responses to them are summarized below.

1. **Determine if the proposed action is in the base flood plain.**

Yes, the project is located in the base flood plain. Due to the nature of alluvial fan flooding, this flood plain is variable and dependent upon features located within the flood plain that could alter the direction of the flood flows, such as roads, railroads, and canals. All of these features are present in the Orestimba Creek floodplain.

2. **If the action is in the base flood plain, identify and evaluate practicable alternatives to the action or to location of the action in the base flood plain.**

Chapter 3 of this document has an analysis of alternatives. The TRP was evaluated in accordance with Section 308 of WRDA 1990, which required that structures built in the 100-year flood plain with a first floor elevation less than the 100-year flood elevation not be included in the benefit base for justifying Federal flood damage reduction projects. The TRP does not include the

value of structures built in the base flood plain after 1991. Based on the alternative evaluation, the TRP would have the least effect on the flood plain compared to the other alternatives.

3. **If the action must be in the flood plain, advise the general public in the affected area and obtain their views and comments.**

Public involvement activities are described in Chapter 6, Public Involvement, Review and Consultation.

4. **Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the base flood plain will affect the base flood plain, impacts resulting from these actions should also be identified.**

Potential impacts associated with the TRP are summarized in Chapter 5 of this report.

5. **If the action is likely to induce development in the base flood plain, determine if a practicable non-flood plain alternative for the development exists.**

The TRP is not likely to induce development in the base flood plain because the existing flood plain is only three feet deep, which is shallow enough for new structures to be raised above this elevation for a reasonable financial cost. Therefore, it is assumed that the TRP would not alter development patterns from the without project condition.

Within the study area, population growth and urban development are driven by local, regional, and national economic conditions. Local land use decisions within the unincorporated area are within the jurisdiction of Stanislaus County. Stanislaus County has adopted a general plan, consistent with state law, which provides an overall framework for growth and development within the county, including the project area.

Environmental analyses have been completed for the TRP pursuant to NEPA and CEQA. These analyses disclose the environmental effects associated with their implementation and describe mitigation measures adopted to eliminate or reduce the severity of environmental effects.

The TRP is consistent with existing land use and project plans in the study area that were approved and initiated before the need for the proposed levee improvements had become apparent. Development in these areas is proceeding in accordance with the applicable plans.

As documented Chapters 4 and 5, there are about 160 acres of Important Farmland within the urban impact area that would have a greatly reduced flood risk with the construction of the TRP. These acres are not part of any approved development plans. As discussed above, the additional flood protection provided by the TRP would not alter future development patterns or result in increased development in areas afforded greater flood protection, since potential development in these areas could be removed from the base flood plain through construction of raised building

pads or foundations. This potential development would be subject to the discretion of the Stanislaus County Board of Supervisors, based on applicable environmental review and planning studies. Detailed evaluation of these potential environmental effects would be speculative at this time.

6. **As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impacts of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the "no action" alternative.**

Mitigation measures are identified and would be implemented as part of the project to minimize the project's potentially adverse impacts.

7. **If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.**

The TRP is scheduled to be released for public review in the summer of 2012. A public meeting will be held during this review.

8. **Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order.**

The objective of the project is to reduce the probability and consequences of flooding in the study area. The project is responsive to the EO 11988 objective of "avoidance, to the extent possible, of long- and short-term adverse impacts associated with the occupancy and modification of the base flood plain and the avoidance of direct and indirect support of development in the base flood plain wherever there is a practicable alternative" because the proposed features focus on reducing the threat of flooding to the existing urban area, altering a very small footprint within the flood plain. These features would reduce the hazard and risk associated with floods thereby minimizing both the probability and the consequences of flooding within the urban area, and would preserve the natural and beneficial values of the base flood plain.

9.2 PLAN IMPLEMENTATION

This section describes the remaining steps to potential authorization of the project by Congress.

9.2.1 Report Completion

The draft Feasibility Report/EA/IS will be circulated for public and agency review for 30 days. A public meeting, as required by law, will be held to obtain comments from the public, agencies,

and other interested parties. After completion of the public review period, comments will be considered and incorporated into the Feasibility Report/EA/IS, as appropriate. Comments received during the public and agency review period, as well as responses to them, will be presented in Appendix F – Comments and Responses. The final Feasibility Report/EA/IS will be provided to any public agency that provides comments on the draft report. Stanislaus County will certify that the final IS was prepared in compliance with CEQA.

9.2.2 Report Approval

The draft Feasibility Report/EA/IS will be circulated for 30 days to agencies, organizations, and individuals who have an interest in the proposed project. All comments received will be considered and incorporated into the final EA/IS, as appropriate. This project is being coordinated with all appropriate Federal, State, and local government agencies. USACE Headquarters would coordinate the public comments, receive comments from affected Federal and State agencies, and complete its own independent review of the final report.

After its review of the final Feasibility Report/EA/IS, including consideration of public comments, USACE Headquarters would prepare the Chief of Engineers' Report. This report would be submitted to the ASA(CW), who would coordinate with the Office of Management and Budget and submit the report to Congress.

9.2.3 Project Authorization and Construction

Once the final report is approved by the Chief of Engineers and the project is authorized by Congress, construction funds must be appropriated by Congress before a Project Partnership Agreement can be signed by USACE and sponsor to begin construction.

9.2.4 Division of Responsibilities

Federal Responsibilities

USACE would accomplish preconstruction, engineering, and design (PED) studies. Once the project is authorized and funds are appropriated, a Project Partnership Agreement would be signed with the State of California as the non-Federal sponsor. After the sponsor provides the cash contribution, lands, easements, rights-of-way, relocations, and disposal areas, as well as assurances, and the Federal Government would construct the project.

Non-Federal Responsibilities

Specific items of local cooperation are identified in Chapter 10. The State of California, as the non-Federal sponsor, plans to enter into local cost-sharing flood control agreements with Stanislaus County, and possibly others to cost share the non-Federal project cost with local entities in accordance with State law. Stanislaus County and the City of Newman intend to form a Benefit

Assessment District to raise funds to pay for the local share and maintenance of the project. A local levee district may also be formed to operate and maintain the flood control portions of the project. It is anticipated that the local levee district would be formed prior to construction of the project.

Views of Non-Federal Sponsor

The non-Federal sponsor supports the TRP. Local interests have been supportive of the study and project. Throughout development of this feasibility report, there has been significant coordination with Stanislaus County, the City of Newman, the State of California, private landowners, and CCID.

Financial Capability of Sponsor

The total estimated non-Federal first cost of the project is $21,100,000 including lands, easements, right of ways, relocations, and disposal areas (LERRDs) using October 2011 price levels. Actual costs may be slightly greater at the time of construction due to inflation. The total estimated value for the project lands, including LERRDs is $8,700,000.

Project Cost-Sharing Agreements

A Design Agreement must be executed between USACE and the non-Federal sponsor in order to cost share the development of detailed plans and specifications. Before construction is started, the Federal Government and the non–Federal sponsor would execute a Project Partnership Agreement. This agreement would define responsibilities of the non-Federal sponsor for project construction as well as operation, maintenance, repair, replacement, and rehabilitation and other assurances.

9.3 SCHEDULE

If the project is authorized in 2013, construction activities could start as early as 2015. Following is a schedule showing the approval and construction phases of the project.

Division Commander's Notice	May 2013
Chief of Engineers Report	July 2013
Potential Authorization	October 2013
USACE and Sponsor Sign Design Agreement	March 2014
Preconstruction Engineering and Design	March 2014 – March 2015
Initiate Construction	May 2015
Complete Physical Construction	October 2017

9.4 FURTHER STUDIES

During the PED phase, several additional studies would be conducted as part of developing detailed designs for the project. These studies include:

- Additional geotechnical analysis of underlying substrates, including an analysis of the canal liner;
- Topographic surveys for project design;
- Preconstruction surveys to avoid direct impacts to nesting birds and other sensitive species;
- Water quality analysis of construction activities and methods.
- Detailed hydraulic analysis to ensure height meets State of California requirements for 0.5% (1/200) ACE flood with assurance.
- Intensive cultural resources survey, evaluations, and mitigation as appropriate, in consultation with the State Historic Preservation Officer (SHPO), and Native American Tribes; as specified in the Programmatic Agreement (PA).

As mentioned in Chapter 1, this study would only partially address the San Joaquin River Basin Authority, and is therefore, called an "Interim Feasibility Report" which indicates that the study is addressing the water resource issues of a specific area within the authority, rather than the entire area authorized for study. Additional studies to address other water resource issues within the Basin could be initiated based on Congressional direction.

CHAPTER 10 – RECOMMENDATIONS

This chapter describes the Items of Cooperation for a Structural Flood Damage Reduction (Single Purpose) Project that will be specifically authorized.

I recommend that the Orestimba Creek Flood Risk Management plan be authorized for implementation, as a Federal project, with such modifications thereof as in the discretion of the Commander, U.S. Army Corps of Engineers, may be advisable. The estimated first cost of the recommended plan is $44,700,000 and the estimated annual OMRR&R cost is $180,000 (2011 price levels). The estimated fully funded Federal first cost is $24,900,000. Federal implementation of the recommended project would be subject to the non-Federal sponsor agreeing to comply with applicable Federal laws and policies, including but not limited to:

a. Provide a minimum of 35 percent, but not to exceed 50 percent of total project costs as further specified below:
    1. Provide 25 percent of design costs in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;
    2. Provide, during the first year of construction, any additional funds necessary to pay the full non-Federal share of design costs;
    3. Provide, during construction, a contribution of funds equal to 5 percent of total project costs;
    4. Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the project;
    5. Provide, during construction, any additional funds necessary to make its total contribution equal to at least 35 percent of total project costs;
b. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share therefore, to meet any of the non-Federal obligations for the project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;
c. Not less than once each year, inform affected interests of the extent of protection afforded by the project;
d. Agree to participate in and comply with applicable Federal flood plain management and flood insurance programs;

e. Comply with Section 402 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 701b-12), which requires a non-Federal interest to prepare a flood plain management plan within one year after the date of signing a project cooperation agreement, and to implement such plan not later than one year after completion of construction of the project;

f. Publicize flood plain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with protection levels provided by the project;

g. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the level of protection the project affords, hinder operation and maintenance of the project, or interfere with the project's proper function;

h. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

i. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

j. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project;

k. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors;

l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total

project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

m. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

n. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

o. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project;

p. Agree, as between the Federal Government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA; and

q. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 103(j) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources

project or separable element thereof, until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

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

Environmental Resources Branch

DRAFT
FINDING OF NO SIGNIFICANT IMPACT
Orestimba Creek Project
Stanislaus County, California

The U.S. Army Corps of Engineers, Sacramento District, has determined that implementing the proposed flood risk project in the vicinity of Orestimba Creek would have no significant effects on the quality of the human environment. The study area is located on the west side of the San Joaquin River in Stanislaus County, California.

The project involves construction of a chevron levee along the city of Newman's northwestern perimeter. The chevron levee maximizes benefits to the urban area by reducing flood dangers associated with Orestimba Creek overflows. The north side of the chevron levee would be constructed along one mile of an unnamed farm road near Lundy Road, about one mile north of town. The approximately four-mile western segment would be constructed along the eastern bank of the existing CCID Main Canal from the unnamed farm road south to the Newman Wasteway.

A draft Feasibility Report and Environmental Assessment-Initial Study (EA/IS) was prepared to evaluate the potential effects to natural and cultural resources in the proposed project area. Based on the evaluation of potential effects and mitigation measures described in the EA/IS, I have determined that the implementation of either the NED Plan or the Locally Preferred would have no significant adverse effects on existing resources. No additional environmental documentation is required, and the project activities may proceed as proposed.

_____ _____

Date

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

CHAPTER 11 – LIST OF RECIPIENTS*

The following agencies, organizations, and persons will be notified of the availability of the Draft Feasibility Report/EA/IS. The notification will provide the location of hardcopies and a web address for accessing an electronic version of the document. Comments received during the 30-day public and agency comment period and responses to those comments will be presented in Appendix F – Comments and Responses.

11.1 ELECTED OFFICIALS AND REPRESENTATIVES

- Governor of California
  - Honorable Edmund G. Brown
- U.S. Senate
  - Honorable Dianne Feinstein
  - Honorable Barbara Boxer
- House of Representatives
  - Honorable Jeffery Denham
- California Senate
  - Honorable Anthony Cannella
- California Assembly
  - Honorable Cathleen Galgiani

11.2 U.S. GOVERNMENT DEPARTMENTS AND AGENCIES

- USDA, Natural Resources Conservation Service
- Department of the Interior
  - Bureau of Reclamation
  - U.S. Fish and Wildlife Service
- Federal Emergency Management Agency

11.3 STATE OF CALIFORNIA GOVERNMENT AGENCIES

- California Department of Transportation
- Governor's Office of Emergency Services

- Resources Agencies
    - Department of Conservation
    - Department of Fish and Game
    - Department of Parks and Recreation
    - Department of Water Resources
    - The Central Valley Flood Protection Board
- Office of Historic Preservation
- State Clearinghouse
- California Environmental Protection Agency
    - Air Resources Board
    - State Water Resources Control Board
    - Regional Water Quality Control Board, Central Valley Region

11.4 LOCAL GOVERNMENT

- City of Newman
- Stanislaus County
    - Board of Supervisors
    - Public Works
    - Office of the Executive Officer

11.5 LOCAL AGENCIES

- Newman City Library
- Central California Irrigation District

11.6 SPECIAL INTEREST GROUPS

- Orestimba Creek Flood Control Agency
- Northern California Railroad
- Union Pacific Railroad
- The Nature Conservancy

CHAPTER 12 – REFERENCES

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