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AMERICAN RIVER WATERSHED, CALIFORNIA: COMMON FEATURES PROJECT: NATOMAS BASIN

COMMUNICATION

FROM

THE ASSISTANT SECRETARY, CIVIL WORKS, THE DEPARTMENT OF THE ARMY

TRANSMITTING

THE COMMON FEATURES PROJECT AUTHORIZED BY SECTION 101(a)(1) OF THE WATER RESOURCES DEVELOPMENT ACT OF 1996

PART 3 OF 4

OCTOBER 25, 2011.—Referred to the Committee on Transportation and Infrastructure and ordered to be printed

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SAFCA
Sacramento
Area Flood
Control
Agency

October 22, 2010

TO: **Commenting Parties**

FROM: **John Bassett, P.E., Director of Engineering, SAFCA**
(916) 874-7606

SUBJECT: **FINAL ENVIRONMENTAL IMPACT STATEMENT/ FINAL ENVIRONMENTAL IMPACT REPORT ON THE AMERICAN RIVER WATERSHED COMMON FEATURES PROJECT/ NATOMAS POST-AUTHORIZATION CHANGE REPORT/ NATOMAS LEVEE IMPROVEMENT PROGRAM, PHASE 4B LANDSIDE IMPROVEMENTS PROJECT (SCH # 2009112025)**

The subject FEIS/FEIR is now available for public review, and has been prepared by the U.S. Army Corps of Engineers (USACE), Sacramento District and the Sacramento Area Flood Control Agency (SAFCA) in accordance with the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), with USACE as the lead agency for NEPA compliance and SAFCA as the lead agency for CEQA compliance. The FEIS/FEIR consists of a reprint of the entire draft environmental impact statement/draft environmental impact report (DEIS/DEIR), responses to comments received on the DEIS/DEIR, and corrections, revisions, and other clarifications, amplifications and minor modifications to the DEIS/DEIR made in response to comments or as a result of USACE's and SAFCA's ongoing planning efforts.

The overall purpose of the Natomas Levee Improvement Program (NLIP) is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The NLIP Landside Improvements Project consists of four phases (1, 2, 3, and 4a and 4b). The Phase 4b Project is the final subphase of the NLIP Landside Improvements Project, and consists of improvements to the remaining portions of the Natomas Basin's perimeter levee system in Sutter and Sacramento Counties, California, and associated landscape and irrigation/drainage infrastructure modifications.

The FEIS/FEIR will be submitted to Congress in late 2010 to support approval of USACE's American River Watershed Common Features Project (Common Features)/Natomas Post-authorization Change Report (Natomas PACR), which is an element of the Common Features General Re-evaluation Report. If the Common Features/Natomas PACR is authorized by Congress, USACE would implement the Phase 4b Project. If authorization is not granted, SAFCA could choose to implement the Phase 4b Project. Construction of the Phase 4b Project is planned for 2012–2016, assuming receipt of Congressional authorization, funding (if SAFCA decides to implement the Phase 4b Project without Federal participation), and all required environmental clearances, authorizations, and permits.

Contents of the FEIS/FEIR

During the public review period for the DEIS/DEIR, written comments were received from Federal, state, and local agencies; tribal government; organizations; businesses; and individuals, as well as oral testimony at a public meeting held on July 15, 2010[1]. The FEIS/FEIR has been prepared to respond to comments received on the DEIS/DEIR, which are reproduced in the FEIS/FEIR, and to present new analysis and information added to the DEIS/DEIR as a result of considering these comments.

FEIS/FEIR Review Periods

The FEIS/FEIR is being distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. NEPA requires a 30-day public review for an FEIS, whereas CEQA requires a 10-day review (for commenting agencies only) for an FEIR. For this FEIS/FEIR, the NEPA and CEQA review periods will run concurrently, with the CEQA review period ending before the NEPA review period, as follows:

NEPA Review Period: October 22–November 22, 2010
CEQA Review Period: October 22–November 12, 2010

The FEIS/FEIR is being provided to those parties who submitted comments on the DEIS/DEIR. Other interested parties may review a printed copy of the FEIS/FEIR at the offices of USACE, Sacramento District or SAFCA (see addresses below) during normal business hours. The FEIS/FEIR is also available for viewing or downloading at USACE's Web site: www.spk.usace.army.mil or SAFCA's Web site: http://www.safca.org/Programs_Natomas.html. Printed or CD copies of the FEIS/FEIR may be requested from USACE by contacting Elizabeth Holland (see contact information below).

Following the CEQA review period, SAFCA will consider certification of the EIR and approval of the Phase 4b Project at the SAFCA Board of Directors meeting scheduled for 3:00 p.m. on November 12, 2010, located in the Sacramento County Board of Supervisors Chambers, Room 1450, at 700 H Street, Sacramento, California. The public is invited to attend in person, or view the meeting on SAFCA's Web site.

Following the NEPA review period, USACE will consider adoption of the EIS and will prepare a Record of Decision (ROD) documenting USACE's decision on the Phase 4b Project.

For further information regarding the FEIS/FEIR or to provide comments on the FEIS/FEIR, please contact Elizabeth Holland, USACE Sacramento District, Planning Division, 1325 J Street, Sacramento, CA, 95814, or email Elizabeth.G.Holland@usace.army.mil; or John Bassett, SAFCA Director of Engineering, 1007 7th Street, 7th Floor, Sacramento, CA 95814, or email BassettJ@saccounty.net.

[1] In addition to the July 15 public hearing, three additional public meetings were conducted during the DEIS/DEIR public review period: July 13, 2010 at the South Natomas Community Center; July 21, 2010 at the Sacramento County Administration Building; and August 4, 2010 at the Pleasant Grove School. No formal comments were received at these three public hearings.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET NW
WASHINGTON, D.C. 20314-1000

Planning and Policy Division

OCT 22 2010

TO INTERESTED PARTIES

Enclosed for your information is a copy of the proposed report of the Chief of Engineers, and on CDROM, the report on American River Common Features, Natomas Basin, Sacramento and Sutter Counties, California, which includes the final environmental impact statement (FEIS) prepared in accordance with the National Environmental Policy Act of 1969 (NEPA). The FEIS is being filed with the Environmental Protection Agency and is being made available to interested parties for review and comment pursuant to regulations of the President's Council on Environmental Quality for implementing NEPA (40 CFR Parts 1500-1508). Printed copies of the report are available upon request. These documents are currently under review by the heads of Federal agencies and the Governor of the State of California. Upon receipt of their comments, the report of the Chief of Engineers will be finalized and submitted to the Secretary of the Army for transmittal to Congress.

Any comments you may have on the FEIS should be directed to the Headquarters, U. S. Army Corps of Engineers, ATTN: CECW-P (IP), 7701 Telegraph Road, Alexandria, VA 22315-3860. The official closing date for the receipt of comments is 30 days from the date on which the notice of availability of the FEIS appears in the Federal Register. This closing date may be somewhat later than 30 days from the date of this letter.

Sincerely,

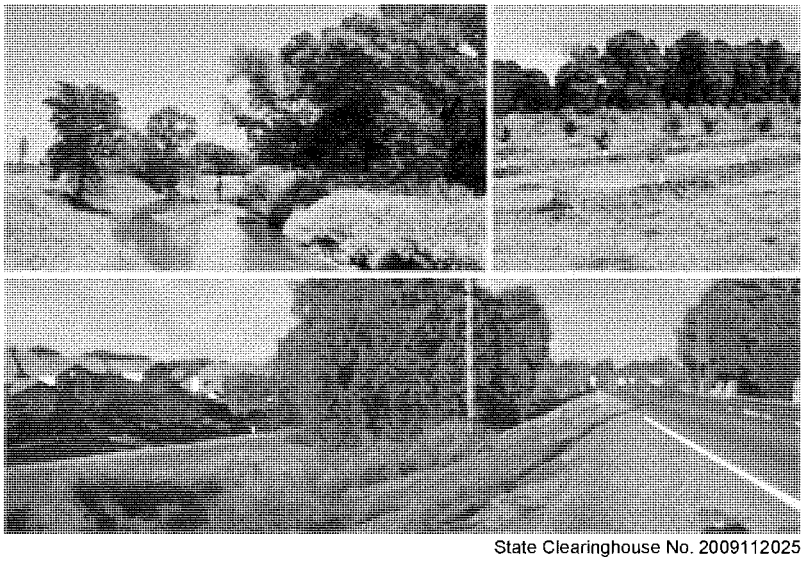
Theodore A. Brown

Theodore A. Brown, P.E.
Chief, Planning and Policy Division
Directorate of Civil Works

Enclosures

Final Environmental Impact Statement/Final Environmental Impact Report on the

American River Watershed Common Features Project/ Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project



State Clearinghouse No. 2009112025

Volume 1 – Chapters 1 through 3

Prepared for:

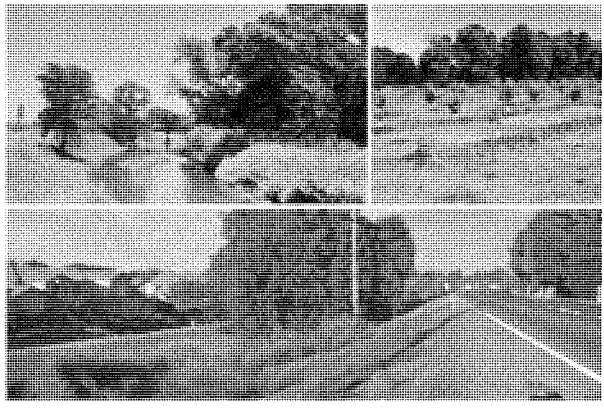
US Army Corps of Engineers
Sacramento District

SAFCA
Sacramento Area Flood Control Agency

October 22, 2010

Final Environmental Impact Statement/Final Environmental Impact Report on the

American River Watershed Common Features Project/ Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project



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Volume 1 – Chapters 1 through 3

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October 22, 2010

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FINAL ENVIRONMENTAL IMPACT STATEMENT/ FINAL ENVIRONMENTAL IMPACT REPORT ON THE AMERICAN RIVER WATERSHED COMMON FEATURES PROJECT/ NATOMAS POST-AUTHORIZATION CHANGE REPORT/ NATOMAS LEVEE IMPROVEMENT PROGRAM, PHASE 4b LANDSIDE IMPROVEMENTS PROJECT

ABSTRACT

Federal Lead Agency: U.S. Army Corps of Engineers (USACE), Sacramento District
State Lead Agency: Sacramento Area Flood Control Agency (SAFCA)
Cooperating Agency: Federal Aviation Administration (FAA)
Non-Federal Sponsor: Central Valley Flood Protection Board (CVFPB)

This final environmental impact statement/final environmental impact report (FEIS/FEIR) has been prepared by USACE and SAFCA in accordance with the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), respectively, to respond to comments received during the agency and public review period for the draft environmental impact statement/draft environmental impact report (DEIS/DEIR) and to present corrections, revisions, and other clarifications to the DEIS/DEIR.

The FEIS/FEIR evaluates the significant environmental impacts of the Phase 4b Landside Improvements Project (Phase 4b Project), and will be submitted to Congress in late 2010 to support approval of USACE's American River Watershed Common Features Project/Natomas Post-authorization Change Report (Common Features/ Natomas PACR), which is an element of the American River Watershed Common Features Project General Re-evaluation Report (Common Features GRR).

The Common Features/Natomas PACR includes all four project phases (1, 2, 3, and 4a and 4b) of the Landside Improvements Project, which is a component of SAFCA's Natomas Levee Improvement Program (NLIP). The overall purpose of the NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The Phase 4b Project is the final phase of the Landside Improvements Project, and consists of improvements to the remaining portions of the Natomas Basin's perimeter levee system in the City of Sacramento and in Sutter and Sacramento Counties, California, associated landscape and irrigation/drainage infrastructure modifications, and habitat creation and management.

If the Common Features/Natomas PACR is authorized by Congress, USACE would implement the Phase 4b Project. In the event that USACE does not receive authorization to construct the Phase 4b Project, SAFCA could choose to implement the Phase 4b Project. In readiness for the latter scenario, SAFCA is requesting permission from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] Section 408, referred to as "Section 408") for alteration of Federal project levees; Section 404 of the Clean Water Act (33 USC Section 1344, hereinafter referred to as "Section 404") for placement of fill in jurisdictional waters of the United States; and Section 10 of the Rivers and Harbors Act of 1899 (33 USC Section 403, referred to as "Section 10") for work performed in, over, or under navigable waters of the United States. This FEIS/FEIR covers the requested permissions from USACE, if needed.

The FAA is serving as a cooperating agency under NEPA because if USACE and SAFCA select an alternative that requires the Sacramento International Airport to seek a release from Federal Airport Improvement Grant assurances, the FAA would use this FEIS/FEIR in exercising its decision-making authority under 49 USC Section 47107 regarding whether to approve those actions. The CVFPB is serving as a non-Federal sponsor of USACE's Common Features/Natomas PACR, and is concerned about integrating overall flood damage reduction in Sacramento.

This FEIS/FEIR summarizes prior environmental analyses for all previously approved project phases of the Landside Improvements Project—including alternatives previously considered, analyzed, and rejected from further consideration—and evaluates in detail the environmental effects of the Phase 4b Project (Proposed Action), including alternatives to the Phase 4b Project. The Proposed Action would result in significant and unavoidable adverse impacts on agricultural resources; land use, socioeconomics, and population and housing; biological resources; cultural resources; transportation and circulation; noise; recreation; visual resources; and hazards and hazardous materials.

Public Review and Comment:

The NEPA public comment period for the FEIS/FEIR begins on October 22, 2010 and closes on November 22, 2010. The CEQA public comment period for the FEIS/FEIR begins on October 22, 2010 and closes on November 12, 2010.

For further information regarding the FEIS/FEIR or to provide comments on the FEIS/FEIR, please contact Elizabeth Holland, USACE Sacramento District, Planning Division, 1325 J Street, Sacramento, CA, 95814, or email Elizabeth.G.Holland@usace.army.mil; or John Bassett, SAFCA Director of Engineering, 1007 7th Street, 7th Floor, Sacramento, CA 95814, or email BassettJ@saccounty.net.

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
24/7	24 hours per day, 7 days per week
AB	Assembly Bill
AC	Advisory Circular
AC	Airport Circular
ACHP	Advisory Council on Historic Preservation
ADT	average daily traffic
AEP	annual exceedance probability
AFY	acre-feet per year
afy	acre feet per year
AG District	General Agriculture District
Airport	Sacramento International Airport
Airport Master Plan	*Sacramento International Airport Master Plan*
ALUC	Airport Land Use Commission
ALUCP	*Sacramento International Airport Land Use Compatibility Plan*
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
APN	Assessor's Parcel Number
APP	Avian Protection Plan
APPA	Airport Policy Planning Area
AQAP	air quality attainment plan
AQMD	air quality management districts
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
ARWI	American River Watershed Investigation
ASA	Assistant Secretary of the Army
AST	above ground storage tank
ATCM	Airborne Toxics Control Measure
AWRI	*American River Watershed Investigation*
B.P.	Before Present
BA	Biological Assessment
BACT	Best Available Control Technology
Basin Plan	*Water Quality Control Plan for the Sacramento and San Joaquin River Basins*
Bay-Delta	San Francisco Bay/Sacramento–San Joaquin Delta
Bikeway Plan	*2010 Sacramento City/County Bikeway Master Plan*

BMP	best management practice
BO	biological opinion
Bypass	Sacramento River and the Yolo Basin
CAA	Clean Air Act
CAA	Federal Clean Air Act
CAAA	Federal Clean Air Act Amendments of 1990
CAAQS	California ambient air quality standards
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Health and Safety Administration
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CB	cement bentonite
CBC	California Building Standards Code
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHP	California Highway Patrol
CLUP	comprehensive airport land use plan
cmbs	centimeters below surface
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
Common Features GRR	American River Watershed Common Features Project General Re-evaluation Report
Common Features/Natomas PACR	American River Watershed Common Features Project/Natomas Post-authorization Change Report
CRHR	California Register of Historical Resources
CVFPB	California Central Valley Flood Protection Board, formerly The Reclamation Board
CVFPB	Central Valley Flood Protection Board

CWA	Clean Water Act of 1972
cy	cubic yards
dB	decibels
dBA	A-weighted decibels
dbh	diameter at breast height
DEIS/DEIR	draft environmental impact report/draft environmental impact statement
Delta	Sacramento–San Joaquin Delta
DFG	California Department of Fish and Game
DMM	Deep-Mix Method
DOC	California Department of Conservation
DPF	diesel particulate filters
DPM	diesel PM
DPS	distinct population segment; formerly Evolutionarily Significant Unit
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EFH	essential fish habitat
EIR	environmental impact report
EIS	environmental impact statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
ESA	Environmental Site Assessment
ESU	Evolutionarily Significant Unit
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FEIR	Final Environmental Impact Report
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FPP	Farmland Protection Program
FPPA	Federal Farmland Protection Policy Act
FR	*Feasibility Report*
FR	*Federal Register*
FRA	USDOT Federal Railroad Administration
FRAQMD	Feather River Air Quality Management District

FSEIS	*Final Supplemental Environmental Impact Statement*
FTA	Federal Transit Administration
FWCA	Fish and Wildlife Coordination Act
GGS	Giant Garter Snake
GHCA	Garden Highway Community Association
GHG	greenhouse gas
Giant Garter Snake/Drainage Canal	new canal designed to provide drainage and associated giant garter snake habitat
gpm	gallons per minute
GRR	General Re-evaluation Report
H:V	horizontal to vertical
HAER	Historic American Engineering Record
HPTP	Historic Property Treatment Plan
HRA	health risk assessments
HUD	U.S. Department of Housing and Urban Development
I-5	Interstate 5
I-80	Interstate 80
in/sec	inch per second
ITE	Institute of Transportation Engineers
kW	kilowatt
L_{50}	noise level exceeded 50% of the time
LAFCo	City of Sacramento and Sacramento Local Agency Formation Commission
lb/day	pounds per day
LCM	Life Cycle Management
L_{dn}	day-night average noise level
L_{eq}	energy-equivalent noise level
LESA	Land Evaluation and Site Assessment
LID	Low Impact Development
LLP	Locally Preferred Plan
L_{max}	maximum noise level
Local Funding EIR	*Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area*, State Clearinghouse No. 2006072098
LOS	level of service
LSCE	Luhdorff & Scalmanini Consulting Engineers
LTMP	Long-Term Management Plan
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendant

mm	millimeter
MMP	Mitigation and Monitoring Plan
MMRP	Mitigation Monitoring and Reporting Program
MRZ	mineral resource zone
MSA	Metropolitan Statistical Area
MTBE	methyl tertiary butyl ether
MTP	Metropolitan Transportation Plan
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NALP	North Area Local Project
Natomas GRR	USACE's Natomas Basin General Re-evaluation Report
Natomas PACR	Natomas Post-authorization Change Report
NAVD88	North American Vertical Datum of 1988
NBHCP	*Natomas Basin Habitat Conservation Plan*
NCASI	National Council for Air and Stream Improvements, Inc.
NCC	Natomas Cross Canal
NCIC	North Central Information Center
NCMWC	Natomas Central Mutual Water Company
NCSHPO	National Conference of State Historic Preservation Officers
NEHRP	National Earthquake Hazards Reduction Program
NEHRPA	National Earthquake Hazards Reduction Program Act
NEIC	Northeast Information Center
NEMDC	Natomas East Main Drainage Canal
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGVD29	National Geodetic Vertical Datum of 1929
NHC	Northwest Hydraulics Consultants, Inc.
NHPA	National Historic Preservation Act
NLIP	Natomas Levee Improvement Program
NMFS	National Marine Fisheries Service
NNCP	North Natomas Community Plan
NO_2	nitrogen dioxide
NOA	Naturally occurring asbestos
NOD	Notice of Determination
NOI	notice of intent
NOP	notice of preparation

NOS	Not Otherwise Specified
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
O&M	operations and maintenance
°C	Celsius
OES	Governor's Office of Emergency Services
OHWM	ordinary high water mark
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PACR	Post-authorization Change Report
PCB	polychlorinated biphenyl
PG&E	Pacific Gas & Electric Company
PGCC	Pleasant Grove Creek Canal
Phase 2 EIR	*Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project*, State Clearinghouse No. 2007062016
Phase 2 EIR 1st Addendum	*Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project – Phase 2 Project*, State Clearinghouse No. 2007062016
Phase 2 EIR 2nd Addendum	*2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project – Phase 2 Project*, State Clearinghouse No. 2007062016
Phase 2 EIS	Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project
Phase 2 SEIR	*Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016
Phase 3 EIR Addendum	*Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060
Phase 3 EIS and EIR	*Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060
Phase 4a EIS and EIR	*Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project*, State Clearinghouse No. 2009032097
Phase 4b Project	Phase 4b Landside Improvements Project
PL	Public Law

PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
$PM_{2.5}$	fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code
Proposed Action	Phase 4b Project
Proposed Project	Phase 4b Project
PSMFC	Pacific States Marine Fisheries Commission
RBDD	Red Bluff Diversion Dam
RCRA	Resource Conservation and Recovery Act
RD	Reclamation District
REC	recognized environmental condition
Reclamation	U.S. Bureau of Reclamation
RM	River Mile
ROD	record of decision
ROG	reactive organic gases
RSLIP	Raise and Strengthen Levee-in-Place
RV	recreational vehicle
RWQCB	Regional Water Quality Control Board
SacDOT	Sacramento County Department of Transportation
SACOG	Sacramento Area Council of Governments
SAFCA	Sacramento Area Flood Control Agency
SB	Senate Bill
SB	soil-bentonite
SCAS	Sacramento County Airport System
SCB	soil-cement-bentonite
SEIR	Supplemental EIR
SGA	Sacramento Groundwater Authority
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SIR	Supplemental Information Report
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SMF	Sacramento International Airport; formerly the Sacramento Metropolitan Airport
SMUD	Sacramento Municipal Utility District

SO_2	sulfur dioxide
SR	State Route
SRA	shaded riverine aquatic
SRBPP	Sacramento River Bank Protection Project
SRFCP	Sacramento River Flood Control Project
STP	shovel test pit
SVAB	Sacramento Valley Air Basin
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
T-BACT	toxic best available control technology
TCP	Traditional Cultural Property
TDS	total dissolved solids
the project	Phase 4b Project
TNBC	The Natomas Basin Conservancy
TPD	tons per day
TPY	tons per year
UBC	Uniform Building Code
UCMP	University of California Museum of Paleontology
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tanks
VdB	vibration decibels
VOC	volatile organic compounds
WDR	waste discharge requirement
WHMP	*Wildlife Hazard Management Plan*
Williamson Act	Important Farmland maps and California Land Conservation Act
WP/SP	Western Pacific/Southern Pacific

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This environmental impact statement/environmental impact report (EIS/EIR) has been prepared by the U.S. Army Corps of Engineers (USACE), Sacramento District and the Sacramento Area Flood Control Agency (SAFCA) in accordance with the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), respectively. This EIS/EIR evaluates the potential significant environmental impacts of the Natomas Levee Improvement Program (NLIP), Phase 4b Landside Improvements Project (Phase 4b Project), and will be submitted to Congress in late 2010 to support approval of USACE's American River Watershed Common Features Project/Natomas Post-authorization Change Report (Common Features/Natomas PACR), which is an element of the American River Watershed Common Features Project General Re-evaluation Report (Common Features GRR).

The Common Features/Natomas PACR includes all four project phases (1, 2, 3, and 4a and 4b) of the Landside Improvements Project, which is a component of the NLIP. The overall purpose of the NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The Phase 4b Project is the final subphase of the Landside Improvements Project, and consists of improvements to the remaining portions of the Natomas Basin's perimeter levee system in the City of Sacramento and in Sutter and Sacramento Counties, California, associated landscape and irrigation/drainage infrastructure modifications, and habitat creation and management.

If the Common Features/Natomas PACR is authorized by Congress, USACE would implement the Phase 4b Project. In the event that USACE does not receive authorization to construct the Phase 4b Project, SAFCA could choose to implement the Phase 4b Project. In readiness for the latter scenario, SAFCA is requesting permission from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] Section 408, hereinafter referred to as "Section 408") for alteration of Federal project levees; Section 404 of the Clean Water Act (33 USC Section 1344, hereinafter referred to as "Section 404") for the placement of fill in jurisdictional waters of the United States; and Section 10 of the Rivers and Harbors Act of 1899 (33 USC Section 403, hereinafter referred to as "Section 10") for work performed in, over, or under navigable waters of the United States (such as excavation of material from or deposition of material into navigable waters). This FEIS/FEIR covers the requested permissions from USACE, if needed.

The project proponent(s) may also need to obtain several state approvals or permits to implement the Phase 4b Project: Central Valley Flood Protection Board encroachment permit, California Surface Mining and Reclamation Act permit or exemption, Clean Water Act Section 401 water quality certification, Clean Water Act Section 402 National Pollutant Discharge Elimination System permit, California Fish and Game Code Section 2081 incidental-take authorization, California Fish and Game Code Section 1602 streambed alteration agreement, California Department of Transportation (Caltrans) encroachment permit, and permits from two local air districts, the Sacramento Metropolitan Air Quality Management District and the Feather River Air Quality Management District.

ES.2 LEAD AGENCIES AND COOPERATING AGENCY

USACE is the Federal lead agency for NEPA, and SAFCA is the California lead agency for CEQA.

The Federal Aviation Administration (FAA) is serving as a cooperating agency for NEPA. In the event that SAFCA and USACE select an alternative that requires the Sacramento International Airport (Airport) to change its Airport Layout Plan or seek a release from Federal Airport Improvement Grant assurances, the FAA would use this EIS/EIR in exercising its decision-making authority under 49 USC Section 47107 regarding whether to approve those actions. The CVFPB is serving as a non-Federal sponsor of USACE's Common Features GRR and

Common Features/Natomas PACR, and is concerned about integrating overall flood damage reduction in Sacramento.

ES.3 PURPOSE AND INTENDED USES OF THIS EIS/EIR

The purpose of this EIS/EIR is to evaluate the potential significant environmental impacts of the Phase 4b Project.

This EIS/EIR will be used to support Congressional approval of USACE's Common Features/Natomas PACR. In the event Congress does not authorize USACE to construct the Phase 4b Project, and SAFCA chooses to proceed with the Phase 4b Project without additional Federal participation, this EIS/EIR will be used to support USACE's decisions regarding whether to grant or deny permission to SAFCA for the Phase 4b Project pursuant to Sections 408, 404, and 10; and SAFCA's decision regarding whether to approve the Phase 4b Project.

SAFCA will consider whether or not to certify the EIR and approve the Phase 4b Project in fall 2010. This decision will be based on numerous factors, including the potential environmental impacts and mitigation measures addressed in this EIS/EIR, permitting requirements, Federal and state authorizations, funding and financing mechanisms, and implementation schedule.

This EIS/EIR will also be used by CEQA responsible agencies, such as the Central Valley Flood Protection Board (CVFPB) and Central Valley Regional Water Quality Control Board, and trustee agencies, such as the California Department of Fish and Game, to ensure that they have met the requirements of CEQA before deciding whether to issue discretionary permits over which they have authority. It may also be used by other state, regional, and local agencies, which may have an interest in resources that could be affected by the project.

This EIS/EIR is not intended to be used as the environmental clearance document for future development projects proposed in the Natomas Basin.

ES.4 DOCUMENTS INCORPORATED BY REFERENCE

Incorporation by reference is encouraged by both NEPA (40 Code of Federal Regulations [CFR] Section 1500.4, 1502.21) and CEQA (California Code of Regulations [CCR] Section 15150). Both NEPA and CEQA require citation to and a brief summary of the referenced material, as well as information about the public availability of the incorporated material. CEQA also requires citation of the state identification number of the EIRs cited. This EIS/EIR is tiered from, or incorporates by reference, information contained in the following documents:

- *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area*, State Clearinghouse No. 2006072098 (Local Funding EIR) (SAFCA 2007a), which evaluates impacts expected to result from the Phase 1 Project at a project level and the NLIP at a program level;

- *Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR) (SAFCA 2007c), which evaluates impacts expected to result from the Phase 2 Project at a project level and the remainder of the NLIP at a program level;

- *Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project* (Phase 2 EIS) (USACE 2008), which evaluates impacts expected to result from the Phase 2 Project at a project level and the remainder of the NLIP at a program level;

- *Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 SEIR) (SAFCA 2009a), which evaluates impacts expected to result from modifications to the Phase 2 Project at a project level;

- *Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR 1st Addendum) (SAFCA 2009c), which evaluates minor changes to the Phase 2 Project;

- *2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project,* State Clearinghouse No. 2007062016 (Phase 2 EIR 2nd Addendum) (SAFCA 2009d), which evaluates minor changes to the Phase 2 Project;

- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIS and EIR) (USACE 2009 and SAFCA 2009b), which evaluates impacts expected to result from the Phase 3 Project at a project level;

- *Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIR Addendum) (SAFCA 2009e), which evaluates minor changes to the Phase 3 Project; and

- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project*, State Clearinghouse No. 2009032097 (Phase 4a EIS and EIR) (USACE 2010 and SAFCA 2009f), which evaluates impacts expected to result from the Phase 4a Project at a project level.

Portions of these documents, where specifically noted, are summarized throughout this EIS/EIR. Printed copies of these documents are available to the public at USACE's office at 1325 J Street, Sacramento, California and are also available on USACE's Web site at http://www.spk.usace.army.mil. These documents are also available at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California, during normal business hours, and on SAFCA's Web site, at http://www.safca.org/Programs_Natomas.html.

ES.5 PROJECT LOCATION

The Natomas Basin is located at the confluence of the American and Sacramento Rivers. Encompassing approximately 53,000 acres, the Basin extends northward from the American River and includes portions of the city of Sacramento, Sacramento County, and Sutter County. In addition to the American and Sacramento Rivers to the south and west, respectively, the Natomas Basin is bordered to the north by the Natomas Cross Canal (NCC) and to the east by the Pleasant Grove Creek Canal (PGCC) and the Natomas East Main Drainage Canal (NEMDC) (**Plate 1-1**). The NCC diverts the runoff from a large watershed in western Placer and southern Sutter Counties around the Natomas area and is a major contributor to the flows in the upper reach of the Sacramento River channel in SAFCA's jurisdiction. The NEMDC is an engineered channel along the southeastern flank of Natomas. Tributaries to the NEMDC include Dry Creek, Arcade Creek, Rio Linda Creek, Robla Creek, and Magpie Creek Diversion Channel. The Natomas Basin is protected from high flows in these tributaries and in the American and Sacramento Rivers by a Federal perimeter levee system.

USACE has divided the flood damage reduction improvements within the Natomas Basin into nine reaches (Reaches A–I), as shown on **Plate 1-3**. USACE's reach designations differ from SAFCA's reach designations, which are more finely subdivided than the USACE system for the Sacramento River east levee, American River north levee, and the NCC. In **Plate 1-3**, lettered reaches follow the USACE designation, while numbered reaches follow the SAFCA designations:

- Sacramento River east levee: Reach A:16–20
- Sacramento River east levee: Reach B:5A–15
- Sacramento River east levee: Reach C:1–4B
- NCC: Reach D:1–7
- PGCC: Reach E: there are no SAFCA reaches, just station numbers

- NEMDC North: Reaches F–G
- NEMDC South: Reach H
- American River north levee: Reach I:1–4

The Natomas Basin floodplain is occupied by more than 83,000 residents and over $8.2 billion in damageable property, including the Airport and extensive urban development, primarily in the southern one-third of the Basin. The remaining agricultural lands in the Natomas Basin provide habitat for several important wildlife species. This habitat is protected under Federal and state laws, and expansion of the urban footprint into much of the remaining agricultural areas is governed by the *Natomas Basin Habitat Conservation Plan* (NBHCP), which is aimed at setting aside and conserving tracts of agricultural land that are needed to sustain the affected species.

The Phase 4b Project location primarily includes the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, NEMDC west levee, PGCC west levee, West Drainage Canal, Riego Road Canal, NCC south levee, and various borrow sites within the Natomas Basin (primarily the Fisherman's Lake Borrow Area, West Lakeside School Site, and Triangle Properties Borrow Area). These areas are shown in the Plates in Chapter 2, "Alternatives," of this EIS/EIR.

ES.6 PROJECT BACKGROUND AND PHASING

As stated above, the overall purpose of the multi-phase NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The Phase 4b Project is the final phase of the NLIP Landside Improvements Project, and consists of improvements to the remaining portions of the Natomas Basin's perimeter levee system in the City of Sacramento and in Sutter and Sacramento counties, California, associated landscape and irrigation/drainage infrastructure modifications, and habitat creation and management.

The NLIP addresses identified deficiencies in the Natomas Basin perimeter levee system based on (1) design criteria used to certify levees as providing 100-year flood risk reduction (0.01 AEP) under regulations adopted by the Federal Emergency Management Agency (FEMA), (2) design criteria used by USACE and the State for the levees comprising the Common Features Project, and (3) design 200-year[1] (0.005 AEP) water surface elevations developed by SAFCA in cooperation with the State using hydrologic modeling data developed by USACE and the State as part of the Sacramento–San Joaquin River Basins Comprehensive Study.

Although SAFCA anticipates that all segments of the Natomas perimeter levee system will eventually be improved to meet all of the above design criteria, SAFCA is partnering with the California Department of Water Resources (DWR) using SAFCA's local assessments and grant funding available through DWR's FloodSAFE California Program to initiate improvements to segments of the Natomas perimeter levee system in advance of full Federal authorization for the constructed improvements. SAFCA anticipates completion of this "early implementation project"—which includes the Phase 2, 3, and 4a Projects—by 2012. Phase 2 Project construction is underway and is anticipated to be completed by 2010; it is anticipated that construction of the Phase 3 and 4a Projects will be completed by 2012. USACE plans to complete improvements to the remaining segments of the perimeter levee system (i.e., the Phase 4b Project). This will require Congressional authorization to expand the scope of the already authorized Common Features Project based on the information and recommendations provided in the Common Features/Natomas PACR. SAFCA is coordinating with USACE to ensure that the planning and design of the early implementation project are consistent with applicable USACE planning,

[1] Design event analysis results, as a measure of system performance, are given as the expected (mean) frequency of the maximum event that can be safely passed through the reservoir, spillway, and downstream leveed system with a set (e.g., 3 feet) "freeboard" above the computed (expected) water surface profile. Design event analysis is not the same as the analysis procedure used by USACE as a basis for determining Federal interest in a project or for USACE certification for FEMA's National Flood Insurance Program. USACE defines system performance as containing a specified frequency event (e.g., 0.01 event) with a high level of assurance (i.e., Conditional Non-exceedance Probability = 0.9) and includes consideration of system uncertainties.

engineering, and design guidelines. This EIS/EIR is the environmental compliance document for and will support the Common Features/Natomas PACR. USACE will subsequently prepare the Common Features GRR, which will cover all elements of the American River Common Features Project, and will be a separate report with its own environmental documentation. USACE and SAFCA recognize that Federal actions taken in connection with the early implementation project will need to be appropriately reflected in both Federal reports.

To move forward as quickly as possible to reduce the risk of flooding in the Natomas Basin, SAFCA identified the broad outlines of the early implementation project at a program level of detail and developed an incremental implementation strategy based on carrying out the project in four phases, with each phase contributing independently and cumulatively to reducing flood risk. Each individual project phase would contribute to reduced flood risk for the Natomas Basin, and thus has independent utility. However, no single project phase would achieve the overall flood risk reduction objectives of the NLIP. The NLIP, as a program, has independent utility from the other areas under consideration in the Common Features GRR because the NLIP will provide added flood risk reduction to an entire area (similar to a ring levee), and this increased flood risk reduction is not dependent on the outcome of the Common Features GRR. The four phases of the NLIP are described below.

The **Phase 1 Project** involved improvements to address underseepage deficiencies affecting a 1.9-mile segment of the NCC south levee (Reach D). The environmental impacts of these improvements were evaluated in the Local Funding EIR (SAFCA 2007a), which the SAFCA Board of Directors certified on February 16, 2007. These improvements were constructed in 2007 and 2008.

The **Phase 2 Project** focuses on improvements to address underseepage and levee height deficiencies along the entire 5.3-mile length of the NCC south levee as well as underseepage, erosion, encroachment, and levee height deficiencies along the upper 4.5 miles of the Sacramento River east levee (Reach C:1–4B). The environmental impacts of these improvements were evaluated in detail in the Phase 2 EIR (SAFCA 2007c), which the SAFCA Board of Directors certified on November 29, 2007; and the Phase 2 EIS, for which a record of decision (ROD) was issued by USACE on January 21, 2009 (USACE also issued the 408 permission and 404 permit for the Phase 2 Project in January 2009). Since certification of the Phase 2 EIR, SAFCA made minor modifications to the design of the Phase 2 Project. A supplemental EIR (Phase 2 SEIR) (SAFCA 2009a) was prepared by SAFCA to evaluate these modifications; the SAFCA Board of Directors certified the SEIR on January 29, 2009, at which time the Board also approved the modifications to the Phase 2 Project. Subsequently, two addenda to the Phase 2 EIR were prepared by SAFCA to evaluate additional minor modifications to the Phase 2 Project; the first Addendum to the Phase 2 EIR (SAFCA 2009c) was certified by the SAFCA Board of Directors on June 8, 2009 and the 2nd Addendum to the Phase 2 EIR (SAFCA 2009d) was certified on August 20, 2009.

The Phase 2 Project could be constructed on a stand-alone basis, assuming no further action on the balance of the NLIP is taken. Construction of the Phase 2 Project began in May 2009 and is anticipated to be completed in 2010, assuming receipt of all required environmental clearances and permits. It is clear that a portion of Phase 2 Project construction will likely be complete prior to construction of the Phase 3 Project. However, it is still likely that there will be some overlap in construction schedules between these two phases (see below).

The **Phase 3 Project** focuses on addressing underseepage, riverbank erosion, encroachment, and levee height deficiencies along the Sacramento River east levee Reach B:5A–9B, the PGCC west levee (Reach E), and a portion of the NEMDC west levee (between Elkhorn and Northgate Boulevards) (Reach H). On February 13, 2009, USACE and SAFCA issued the Phase 3 DEIS/DEIR for public review and comment. Following public review, SAFCA prepared a final EIR (FEIR) (SAFCA 2009b) to provide responses to comments on the Phase 3 DEIS/DEIR. The SAFCA Board of Directors certified the FEIR and approved the Phase 3 Project on May 21, 2009. Separately, USACE prepared a final EIS (FEIS) (USACE 2009) that was issued for public review on August 21, 2009. A ROD was issued on April 2, 2010, at which time USACE also issued the 408 permission and 404 permit for the Phase 3 Project.

After the May 21, 2009 certification of the Phase 3 EIR, SAFCA made minor modifications to the design of the Phase 3 Project. An addendum to the Phase 3 EIR (SAFCA 2009e) was prepared by SAFCA to evaluate these modifications; the SAFCA Board of Directors certified the Addendum and approved the modifications to the Phase 3 Project on September 17, 2009.

To construct the Phase 3 Project with minimal interruption of and conflict with drainage/irrigation services and wildlife habitat (specifically, giant garter snake habitat), some Phase 3 Project components were constructed in 2009 in advance of major levee construction that is scheduled to occur in 2010. To facilitate this staged construction, a staged permitting approach was developed for the Phase 3 Project. Specifically, irrigation and drainage infrastructure (termed the Phase 3a Project) was permitted by USACE and the Central Valley RWQCB under Sections 404 and 401, respectively, of the Clean Water Act, on October 7, 2009. Some vegetation encroachments would also occur during the non-nesting season for raptors and other bird species. A separate, but related, set of permits for the Phase 3 Project's levee construction and pumping plant improvements (termed the Phase 3b Project) was issued in spring 2010.

Preliminary construction (canal work, utility relocation, vegetation removal, and demolition of structures) of the Phase 3a Project began in fall 2009, with major levee construction (Phase 3b) planned to begin in 2010, assuming receipt of all required environmental clearances and permits. The potential exists for up to 30% of the Phase 2 Project to also be constructed in 2010, concurrent with major Phase 3 Project levee construction, or even potentially concurrently with the Phase 4a Project, depending on the timing and availability of funding, and environmental clearances and permits.

The **Phase 4a Project** includes levee raising and seepage remediation along the Sacramento River east levee (Reach B:10–15) and in two locations of the NCC south levee (Reach D), relocation and extension of the Riverside Canal, and modifications to the Riverside Pumping Plant and Reclamation District 1000's Pumping Plant Nos. 3 and 5. On August 28, 2009, USACE and SAFCA issued the Phase 4a DEIS/DEIR for public review and comment. Following public review, SAFCA prepared an FEIR (SAFCA 2009f). The SAFCA Board of Directors certified the FEIR and approved the Phase 4a Project on November 13, 2009. Separately, USACE prepared an FEIS (USACE 2010) that was issued for public review in February 2010. USACE will consider whether to grant Section 408 permission and issue permits under Sections 404 and 10, and document its decision in a ROD, expected in fall 2010. The Phase 4a Project could be constructed at the same time as portions of the Phase 3 Project. Construction of the Phase 4a Project is planned to begin in 2011 and to be completed in 2012, assuming receipt of all required environmental clearances and permits.

The **Phase 4b Project** would address underseepage, stability, erosion, penetrations, and levee encroachments along approximately 3.4 miles of the Sacramento River east levee in Reach A:16–20, approximately 1.8 miles of the American River north levee (Reach I:1–4), approximately 6.8 miles of the NEMDC west levee (Reach F–G), approximately 3.3 miles of the PGCC west levee (Reach E), and the gaps left in the improvements of previous phases at levee penetrations and road crossings on the NCC south levee. This EIS/EIR evaluates at a project-level the direct, indirect, and cumulative effects of the Phase 4b Project, which was evaluated at a program level in the Local Funding EIR, Phase 2 EIR, and Phase 2 EIS. Construction of the Phase 4b Project is planned to begin as early as 2012 and anticipated to be completed in 2016, assuming receipt of Congressional authorization, funding (if SAFCA pursues without Federal participation), and all required environmental clearances and permits.

Each of the project phases discussed above also includes associated habitat, drainage, irrigation, related infrastructure improvements, and borrow sites.

ES.7 NEED FOR ACTION

The need for the action is to reduce the flood risk to the Natomas Basin.

The Natomas Basin floodplain is occupied by over 83,000 residents and $8.5 billion in damageable property. Although improvements to the Natomas Basin perimeter levee system, completed as part of the Sacramento Urban Levee Reconstruction Project and the North Area Local Project (NALP), have significantly reduced flood risk for the area, the Natomas Basin remains vulnerable to flooding in a less than 100-year (0.01 AEP) flood event. Uncontrolled flooding in the Natomas Basin floodplain in a flood exceeding a 100-year (0.01 AEP) event could result in $7.4 billion in damage (this excludes the Airport facilities) (SAFCA 2007b). Flooding could also release toxic and hazardous materials, contaminate groundwater, and damage the metropolitan power and transportation grids. The disruption in transportation that could result from a major flood could affect the Airport and interstate and state highways. In addition, displacement of residents, businesses, agriculture, and recreational areas could occur. Resulting damage could hinder community growth, stability, and cohesion.

The NLIP was initially outlined in the *Natomas Levee Evaluation Study Final Report Prepared for SAFCA in Support of the Natomas Basin Components of the American River Common Features* (SAFCA 2006). This evaluation was based on the engineering studies and reports that were included as appendices to the above-referenced report, which are available for review at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California. These studies and reports indicate that segments of the Natomas perimeter levee system reflect the following problems for both the FEMA 100-year (0.01 AEP) and the 200-year (0.005 AEP) design water surface elevations:

- inadequate levee height,
- through-levee seepage and foundation underseepage with excessive hydraulic gradients,
- embankment instability, and
- susceptibility to riverbank erosion and scour.

Although not highlighted in the levee evaluation report, portions of the perimeter levee system, particularly along the east levee of the Sacramento River, are also subject to vegetative and structural encroachments into the levee prism.

In January 2008, FEMA remapped the Natomas Basin as an AE zone, and the flood zone designation took effect in December 2008. FEMA defines AE zones as areas with a 0.01 AEP of flooding. The designation requires mandatory flood insurance purchases by homeowners and requires that the bottom floor of all new buildings be constructed at or above base flood elevation—as little as 3 feet above ground level in some of the Natomas Basin but up to 20 feet above ground level in much of the Basin. This designation and the associated constraints effectively stopped all projects that were not issued building permits before the new maps took effect.

ES.8 PROJECT PURPOSE/PROJECT OBJECTIVES

USACE and SAFCA each view the project purpose from the purview of their respective responsibilities, as defined below.

ES.8.1 U.S. ARMY CORPS OF ENGINEERS

The overall purpose of the project is to develop and select an alternative that would reduce the risk of flood damage in the Natomas Basin. Some residual risk will always remain, however, in any flood damage reduction system. Ultimately, Congress must authorize the Common Features/Natomas PACR, which includes the Phase 4b Project. If not authorized by Congress, USACE must make decisions on whether or not to grant permission to SAFCA to alter the Natomas Basin levee system (Federal project levees) under Section 408, and issue permits under Sections 404 and 10, for SAFCA to implement the Phase 4b Project without Federal participation.

ES.8.2 SACRAMENTO AREA FLOOD CONTROL AGENCY

SAFCA's project objectives adopted in connection with the NLIP are: (1) provide at least a 100-year level of flood risk reduction (0.01 AEP) to the Natomas Basin as quickly as possible, (2) provide 200-year flood risk reduction (0.005 AEP) to the Basin over time, and (3) avoid any substantial increase in expected annual damages as new development occurs in the Basin. The first two project objectives would reduce the residual risk of flooding sufficiently to meet the minimum requirements of Federal and state law for urban areas like the Natomas Basin. The third project objective is a long-term objective of SAFCA's.

Additional project objectives that have informed SAFCA's project design are to:

(1) use flood damage reduction projects in the vicinity of the Airport to facilitate management of Airport lands in accordance with the Airport's *Wildlife Hazard Management Plan* (WHMP); and

(2) use flood damage reduction projects to increase the extent and connectivity of the lands in the Natomas Basin being managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species.

SAFCA's approach to defining flood risk reduction accomplishments (system performance) differs from that of USACE; however, the method for determining hydraulic impacts is the same. The hydraulic impact analysis contained in this EIS/EIR evaluates hydraulics impacts based on upstream levees failing when overtopped along with the condition of allowing upstream levees to overtop without failing (see Section 4.5, "Hydrology and Hydraulics"). References in this EIS/EIR to levels of flood risk reduction are based on SAFCA's "best estimate" approach (FEMA's and the State's current method), and should not be taken as USACE concurrence that such levels would be achieved based on USACE's approach of incorporating risk and uncertainty in the estimate of system performance. In any case, flood risk to the Natomas Basin would be considerably reduced by the project.

ES.9 ALTERNATIVES SCREENING

USACE and SAFCA formulated the project and a reasonable range of alternatives that would achieve the specific project objectives through the following steps:

- identification of the deficiencies in the Natomas levee system that must be addressed to provide at least 100-year (0.01 AEP) flood risk reduction as quickly as possible;
- identification of the deficiencies in the Natomas levee system that must be addressed to provide 200-year (0.005 AEP) flood risk reduction,
- identification of feasible remedial measures to address the deficiencies,
- determination of the likely environmental impacts of the remedial measures,
- development of a reasonable range of flood damage reduction alternatives for implementing the remedial measures; and
- identification of measures to ensure that each alternative would improve aviation safety, minimize impacts on significant cultural resource sites, and enhance habitat values.

Alternatives screening for the overall NLIP has been undertaken in a systematic manner through several environmental documents as summarized in Chapter 2, "Alternatives," and detailed in **Appendix B1**.

ES.10 ALTERNATIVES

ES.10.1 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Numerous alternatives have been considered by USACE and SAFCA to reduce flood risk in the Natomas Basin. Many alternatives have been evaluated and eliminated from further consideration during completion of the previous NLIP environmental documents (see ES.2, "Purpose and Intended Uses of This Document"). A summary of the alternatives considered but eliminated from further consideration is provided in Chapter 2, "Alternatives," and **Appendix B1**.

ES.10.2 ALTERNATIVES CARRIED FORWARD FOR EVALUATION IN THIS EIS/EIR

Three alternatives, one no-action and two action alternatives, were carried forward for detailed analysis in this EIS/EIR: No-Action Alternative (which includes two scenarios: No Phase 4b Project Construction and Potential Levee Failure), Adjacent Levee Alternative (Proposed Action), and Fix-in-Place Alternative. These alternatives are summarized below and described in detail in Chapter 2, "Alternatives." The major project elements of the action alternatives are summarized in **Table ES-1**.

The No-Action Alternative, under NEPA, is the expected future without-project conditions. Under CEQA, the No-Action Alternative is the existing condition at the time the notice of preparation was published (November 5, 2009) as modified by what would be reasonably expected to occur in the foreseeable future if the project were not approved. The Phase 4b Project **No-Action Alternative** assumes the Phase 1, 2, 3, and 4a Projects are implemented. This alternative consists of the conditions that would be reasonably expected to occur in the foreseeable future if no additional permissions to alter the existing levees or discharge dredged or fill material into waters of the United States would be granted. Different scenarios are possible under this circumstance. Under one scenario, no project construction would occur and, thus, no construction-related impacts would occur under this alternative (this scenario is referred to in this EIS/EIR as "No-Action Alternative: No Phase 4b Project Construction"). Without improvements to the Natomas perimeter levee system (e.g., implementation of one of the action alternatives, described below), the Natomas area would continue to be designated as a special flood hazard area; new development would be effectively precluded in most areas of the Natomas Basin; and existing residential, commercial, and industrial developments in the Natomas Basin would remain subject to a significant risk of flooding. Under the second scenario, a levee failure and subsequent flooding would be considered reasonably foreseeable, if the project were not approved. Therefore, this EIS/EIR includes an analysis of the resulting potential impacts (this scenario is referred to in this EIS/EIR as "No-Action Alternative: Potential Levee Failure"); however, because impacts associated with a potential levee failure are largely unknown and would depend on the location and extent of flooding, many of these potential impacts are considered too speculative for meaningful consideration. A general, qualitative discussion of the likely impacts is nonetheless provided in this EIS/EIR.

Under the **Adjacent Levee Alternative (Proposed Action)**, an adjacent levee would be constructed along the Sacramento River east levee Reach A:16–20; and, where required for this levee, cutoff walls, seepage berms, and relief wells would be installed for seepage remediation. A cutoff wall would be installed in the American River north levee east of Gateway Oaks Drive to Northgate Boulevard, and the landside slope would be flattened. The NEMDC west levee would be raised in place or widened from just south of Elkhorn Boulevard to Sankey Road, and the landside slope would be flattened and seepage remediation would be constructed as necessary. Waterside erosion protection would be constructed in locations along the PGCC and NEMDC (south of Elkhorn Boulevard). Culverts located beneath the PGCC would be upgraded or removed, and replacement flood storage would be provided as needed. At the SR 99 crossing of the NCC, seepage remediation would be installed and a moveable barrier system would be constructed to prevent overflow from reaching the landside of the NCC south levee. The western portion of the West Drainage Canal would be realigned to the south, and the remaining portion of the existing canal would be improved to reduce bank erosion and sloughing, decrease aquatic weed infiltration, improve RD 1000 maintenance access, and enhance giant garter snake habitat connectivity. Irrigation canals and

Table ES-1
Summary of the Major Project Elements of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Major Project Elements	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
Sacramento River east levee (Reach A:16–20): Levee widening/rehabilitation and seepage remediation	Construct an adjacent levee with flattened landside slope and cutoff walls, seepage berms, and relief wells, where required, to reduce potential underseepage and seepage through the levee (**Plates 2-7a** and **2-7b**). Cutoff wall construction may be conducted 24 hours per day, 7 days per week (24/7), except in the urbanized area east of the Interstate 80 (I-80) overcrossing, where it would be restricted to daytime hours.	Same as the Adjacent Levee Alternative (Proposed Action), *except that the levee crown would not be widened by 15 feet, necessitating waterside vegetation removal to comply with USACE guidance criteria.*
Sacramento River east levee (Reach B:10–15): Levee raise extension	Extend levee raise within Phase 4a Project footprint from Station 635+00 to 680+00 to address levee height requirements.	Same as the Adjacent Levee Alternative (Proposed Action)
American River north levee (Reach I:1–4): Slope flattening and seepage remediation	Flatten the slope and install cutoff walls in the American River north levee from just east of Gateway Oaks Drive to Northgate Boulevard (**Plate 2-9**). Cutoff wall construction would be restricted to daytime hours.	Same as the Adjacent Levee Alternative (Proposed Action)
NEMDC North (Reaches F–G): Levee raising, slope flattening, and seepage remediation	Raise the levee in place or construct an adjacent levee, flatten slopes, and install cutoff walls from Sankey Road to Elkhorn Boulevard. Cutoff wall construction may be conducted 24/7.	Same as the Adjacent Levee Alternative (Proposed Action)
PGCC (Reach E) and NEMDC South (Reach H): Levee raising and slope flattening	Raise the levee in place or construct a raised adjacent levee and flatten slopes from Howsley Road to Sankey Road on the PGCC west levee (**Plate 2-13**). On the NEMDC South, install a cutoff wall, flatten the slope, and raise the levee in place or construct an adjacent levee for approximately 500 feet south of Elkhorn Boulevard (**Plate 2-14**). Cutoff wall construction may be conducted 24/7.	Same as the Adjacent Levee Alternative (Proposed Action)
PGCC (Reach E) and NEMDC South (Reach H): Waterside improvements	Erosion repair and rock slope protection at locations where erosion around the outfall structures penetrating the levee has been observed. Construct additional remediation to protect against damage caused by beavers and burrowing animals (**Plates 2-13** and **2-14**).	Same as the Adjacent Levee Alternative (Proposed Action)
PGCC (Reach E) culvert remediation	Upgrade or remove five culverts that currently drain the area east of the PGCC by passing water under the canal to drainage ditches along the landside of the PGCC west levee (**Plate 2-13**). Under the culvert removal option, construct detention basins east of the PGCC levee to provide replacement storage for drainage. Depending on the design of the detention basins, pumping stations may be needed to discharge water out of the basins and into the PGCC. Installation of culverts under Pierce-Roberts drain, Pleasant Grove Creek, and Curry Creek may also be needed to interconnect drainage subbasins.	Same as the Adjacent Levee Alternative (Proposed Action)
SR 99 NCC Bridge remediation (Reach D:6)	Construct a moveable barrier system or a stop log gap at the south end of the SR 99 bridges to be used at high river stages to prevent overflow from reaching the landside of the NCC south levee. Modify the bridge deck connections to the supporting piers and abutments as needed to resist uplift pressure during high water stages. Install additional seepage remediation consisting of seepage cutoff walls where the bridges cross the NCC south levee (Reach D:6). Cutoff wall construction may be conducted 24/7.	Same as the Adjacent Levee Alternative (Proposed Action)

Table ES-1
Summary of the Major Project Elements of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Major Project Elements	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
West Drainage Canal	Realign the West Drainage Canal to shift an approximately 1-mile portion, starting at I-5, to an alignment farther south of the Airport Operations Area. Modify the existing canal east of the alignment to reduce bank erosion and sloughing, decrease aquatic weed infiltration, improve RD 1000 maintenance access, and enhance giant garter snake habitat connectivity.	Same as the Adjacent Levee Alternative (Proposed Action)
Riego Road Canal (highline irrigation canal) relocation	Relocate approximately 4,000 feet of irrigation canal, approximately 250 feet of buried irrigation piping and culverts, and several irrigation turn-out structures away from the proposed levee footprint for the northern segment of the NEMDC west levee (Reaches F–G).	Same as the Adjacent Levee Alternative (Proposed Action)
NCC south levee ditch relocations	Relocate the Vestal Drain ditch and Morrison Irrigation Canal landward to reduce underseepage potential at the NCC south levee (Reach D:2, 5, and 6).	Same as the Adjacent Levee Alternative (Proposed Action)
Modifications to RD 1000 Pumping Plants	Raise and/or replace the discharge pipes for Pumping Plant Nos. 1A and 1B along the Sacramento River east levee and Pumping Plant Nos. 6 and 8 along the NEMDC west levee (Reaches G–H). Construct new outfall structures for Pumping Plant Nos. 6 and 8, requiring dewatering of portions of the NEMDC. Construction for Pumping Plant Nos. 6 and 8 may be conducted 24/7.	Same as the Adjacent Levee Alternative (Proposed Action)
Modifications to City of Sacramento Sump Pumps	Raise and/or replace the discharge pipes for City Sump 160 (Sacramento River east levee Reach A:19B), City Sump 58 (American River north levee [Reach I:3]), and City Sump 102 (NEMDC west levee at Gardenland Park [Reach H]). Construct new outfall structures, requiring dewatering of portions of the Sacramento River, the low-flow channel of the NEMDC along the waterside of the American River north levee, and the NEMDC. Relocate pump stations as needed to accommodate the proposed levee improvements. Construction City Sump 102 may be conducted 24/7.	Same as the Adjacent Levee Alternative (Proposed Action)
Borrow site excavation and reclamation	Excavate earthen material at the borrow sites and then return the sites to preconstruction uses or suitable replacement habitat. For levee improvements along the Sacramento River east levee (Reach A:16–20) and the American River north levee (Reach I:1–4), the proposed South Fisherman's Lake Borrow Area (**Plate 2-7a**) and the West Lakeside School Site (**Plate 2-17**) are anticipated to be the primary source of soil borrow material. A portion of the Fisherman's Lake Borrow Area (identified on **Plate 2-6**), which was fully analyzed in the Phase 4a EIS/EIR, could provide additional borrow material for these improvements. The proposed Triangle Properties Borrow Area (**Plate 2-13**) would be the primary source of borrow material for levee improvements along the PGCC (Reach E) and NEMDC North (Reach F–G). The Krumenacher borrow site and Twin Rivers Unified School District stockpile site (**Plate 2-14**), which were fully analyzed in previous environmental documents, would be the source of borrow material for improvements to NEMDC South and back-up sources for NEMDC North (Reach F–G). The South Fisherman's Lake Borrow Area, the West Lakeside School Site, and the Triangle Properties Borrow Area are fully analyzed in this EIS/EIR.	Same as the Adjacent Levee Alternative (Proposed Action)

Table ES-1
Summary of the Major Project Elements of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Major Project Elements	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
Habitat creation and management	Enhance connectivity between northern and southern populations of giant garter snake in the Natomas Basin by improving habitat conditions along the West Drainage Canal; establish woodlands consisting of native riparian and woodland species in the vicinity of the American River Parkway as compensation for woodland impacts along the Sacramento River east levee (Reach A:16–20), American River north levee (Reach I:1–4), PGCC (Reach E), and NEMDC (Reaches F–H); and create up to 200 acres of managed marsh from Brookfield Borrow Site to compensate for impacts to giant garter snake habitat as a result of loss of rice from levee and canal improvements, widen and extend the Chappell Ditch south of the borrow site to enhance delivery of surface water, and improve the adjacent Chappell Drain.	Same as the Adjacent Levee Alternative (Proposed Action), *except landside woodland compensation would be up to 70 acres.*
Infrastructure relocation and realignment	Relocate and realign private irrigation and drainage infrastructure (wells, pumps, canals, and pipes) and water and sanitary sewer lines, and relocate utility infrastructure (power poles) as needed to accommodate the levee improvements and canal relocations. Well construction may be conducted 24/7.	Same as the Adjacent Levee Alternative (Proposed Action)
Landside vegetation removal	In Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, and NEMDC South (Reach H), vegetation would be cleared to prepare for Phase 4b Project levee and canal improvement work. To comply with USACE vegetation guidance, all vegetation would be cleared at least 15 feet from the landside toes of the improved levees (Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4).	Same as the Adjacent Levee Alternative (Proposed Action), *except maximum extent of removal would be reduced by approximately 1 acre.*
Waterside Vegetation Removal	Waterside vegetation would be removed due to erosion control measures and modifications to pumping plants along the Sacramento River east levee (Reach A:16–20), NEMDC west levee (Reaches F–H), and PGCC west levee (Reach E). However, it is assumed that construction of an adjacent levee (the Adjacent Levee Alternative [Proposed Action]) in Sacramento River east levee Reach A:16–20 would allow the levee to qualify for a variance from USACE vegetation guidance criteria such that removal of waterside vegetation would not be necessary. Along the American River north levee Reach I:1–4, the levee is already considered overbuilt, and therefore it is assumed that it would also qualify for a variance from USACE vegetation guidance, allowing waterside vegetation to remain. Like the American River north levee, a section of NEMDC South from Northgate Boulevard to the Arden-Garden Connector is also assumed to be overbuilt enough that clearance of waterside vegetation would also not be necessary under a variance request to USACE. Along the west levee of NEMDC South north of the Arden-Garden Connector(Reach G), at a minimum, if a variance request is granted by USACE, vegetation removal would be required for all non-native trees from within the vegetation-free zone, all native trees that have a dbh of four inches or less, and all larger native trees that are located in the upper third of the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet). Under a worst-case scenario, vegetation with stem widths that have a dbh greater than two inches would be cleared to the water's edge of the NEMDC.	Same as the Adjacent Levee Alternative (Proposed Action) for modifications to RD 1000 pump stations and for the NEMDC west levee south of the NEMDC Stormwater Pumping Station. *In Reach A:16–20 of the Sacramento River east levee, it is assumed that because of the uncertainty of how USACE levee vegetation guidance criteria would be applied where the levee is not widened by an additional 15 feet (as under the Adjacent Levee Alternative [Proposed Action]), approximately 19 acres of waterside vegetation would need to be removed from the waterside hinge point of the levee crown to the water's edge as a worst-case scenario.*

Table ES-1
Summary of the Major Project Elements of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Major Project Elements	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
Bank protection	Bank protection would be constructed along the NEMDC South (Reach H) and PGCC (Reach E) to address the waterside erosion sites because, as noted above, the adjacent levee would be constructed in Sacramento River east levee Reaches A–C.1–20 under the NLIP; no erosion protection is needed along the left bank of the Sacramento River. The distance from the projected levee slope of the new adjacent levee to the current bank location is sufficient to guarantee that bank erosion would not intrude into the projected levee slope in the near future.	Same as the Adjacent Levee Alternative (Proposed Action)
Right-of-way acquisition	Acquire lands within the Phase 4b Project footprint along the Sacramento River east levee (Reach A:16–20), American River north levee (Reach I:1–4), NEMDC west levee (Reaches F–G), PGCC west levee (Reach E), and at associated borrow sites.	Same as the Adjacent Levee Alternative (Proposed Action)
Encroachment management	Remove encroachments as required to meet the criteria of USACE, CVFPB, and FEMA. SAFCA would be required to submit a variance request to CVFPB, and then ultimately to USACE, requesting confirmation that SAFCA's adjacent levee design for the Sacramento River east levee (Reach A–C.1–20), American River north levee (Reach I:1–4), and NEMDC west levee (Reach F–G) sufficiently addresses USACE's guidance regarding vegetation on levees, if SAFCA chooses to implement the project without Federal participation.	Same as the Adjacent Levee Alternative (Proposed Action), *except in Reach A:16–20 of the Sacramento River east levee, it is assumed, as stated above, that the levee would not be in compliance with levee vegetation requirements on the waterside.*
Natomas Levee Class 1 Bike Trail Project	Construct a bicycle and pedestrian trail along the 42-mile loop of the Natomas Basin levee perimeter in the northwestern portion of the County of Sacramento, southern portion of Sutter County, and a portion of the City of Sacramento (program-level analysis only; because site-specific details are not available).	Same as the Adjacent Levee Alternative (Proposed Action)

Notes: 24/7 = 24 hours per day/7 days per week; CVFPB = Central Valley Flood Protection Board; dbh = diameter in breast height; FEMA= Federal Emergency Management Agency; I-80 = Interstate 80; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; SR = State Route; USACE = U.S. Army Corps of Engineers; SAFCA = Sacramento Area Flood Control Agency

Source: Compiled by AECOM in 2010

ditches would be relocated either to make room for expanded levee sections or to reduce underseepage potential. Discharge pipes for RD 1000 pumping plants and City of Sacramento sump pumps would be raised to cross the levee above design flood water surface elevation. Parcels in the South Fisherman's Lake and Triangle Properties Borrow Areas and at the West Lakeside School Site would be excavated and reclaimed as agricultural land. Woodland groves would be established to compensate for impacts along the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1-4, and NEMDC.

Under the **Fix-in-Place Alternative**, the Sacramento River east levee would be improved in place in Sacramento River east levee Reach A:16–20 and seepage remediation would be implemented. The Fix-in-Place Alternative would be the same as described for the Adjacent Levee Alternative (Proposed Action) except that the crown of the Sacramento River east levee would not be widened. This type of levee improvement would narrow the overall landside footprint by 15 feet but would require a greater extent of levee degrade to construct cutoff walls and a greater extent of encroachment removal along the Sacramento River east levee compared to the Adjacent Levee Alternative (Proposed Action). Differences from the Adjacent Levee Alternative (Proposed Action), including encroachment removal and reduced footprint impacts, are shown in italicized text in **Table ES-1**.

ES.11 MAJOR CONCLUSIONS OF THE ENVIRONMENTAL ANALYSIS

The potential environmental impacts of the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration, and mitigation measures to avoid, eliminate, minimize, or reduce the significant and potentially significant impacts to less-than-significant levels, are summarized in **Table ES-2** (presented at the end of this executive summary). This table also presents additional information on the impacts, including duration and quantification, where available, to provide a comparison among the alternatives.

ES.11.1 SUMMARY OF PROJECT MITIGATION AND CONSULTATION

Project mitigation needs have been coordinated with the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the California Department of Fish and Game (DFG) over the past four years as the NLIP Landside Improvement Project has gone through the Section 408/404 permit process. During the previous three project phases, project-induced impacts have been sufficiently compensated for through Section 7 consultation at the Federal level and the 2081 permit process at the State level. No additional compensation was recommended under the Fish and Wildlife Coordination Act. Although Federal agencies are not required to mitigate for State-listed species, mitigation for these species is required for species that are also Federally listed (e.g., fish, giant garter snake) or as recommended under the Fish and Wildlife Coordination Act. The non-Federal sponsor is required to comply with the California Endangered Species Act (CESA) and these compliance measures are included as part of the project. During project planning, steps were taken to avoid, minimize, reduce, and compensate for impacts to endangered species. Compensatory mitigation was first evaluated within the project area, and if these steps were not sufficient, mitigation banks were then considered.

In 1997, the NBHCP was approved under Section 10 of the Federal Endangered Species Act (ESA) by USFWS and Section 2081 of the California Fish and Game Code by DFG. The NBHCP established a multiple-species conservation program for the Natomas Basin that is managed by The Natomas Basin Conservancy (TNBC), a private, non-profit organization that serves as "plan operator" of the NBHCP. To avoid conflict with NBHCP lands, the resource agencies requested that the NLIP be coordinated with TNBC. In the programmatic biological opinion for the NLIP (**Appendix D1**), USFWS analyzed the cumulative effects of the project on the NBHCP, specifically stating that:

> "...while SAFCA is not a signatory to the NBHCP, the plan sets forth a regional conservation strategy that covers the entire basin. The NBHCP's efficacy in maintaining a viable population of giant garter snakes in the Basin depends, in a significant part, on the retention of a sufficient amount of undeveloped acreage throughout the Basin, to ... provide habitat for all 22 of the

NBHCP covered species, including the giant garter snake [and Swainson's hawk]" (**Appendix D1**:53).

Another purpose of this coordination was to enhance the existing lands under jurisdiction of the NBHCP and increase connectivity between core habitat reserves that are distributed throughout the Basin.

Overall, the NLIP is an opportunity to employ a landscape-scale vision, helping to advance the goals and objectives of the NBHCP. Rather than a piecemeal approach to habitat protection, the NLIP secures and expands the amount of habitat protection in the Basin, establishes the components that tie the NBHCP preserves and disparate mitigation sites together in perpetuity under public ownership, and increases the quality and viability of this area. The following goals were considered when developing the mitigation plan:

- increase the amount of protected habitat;
- expand and consolidate the protected habitat in the Natomas Basin;
- strengthen connectivity between the NBHCP reserves;
- avoid significant habitat impacts, particularly to Swainson's hawks and special-status fish, through careful project design and construction phasing;
- develop a mitigation and monitoring plan and a long-term management plan; and
- utilize disturbed area to mitigate impacts.

The Natomas Basin is a unique ecological system separated from other systems by a circular levee system. Regional watershed boundaries, such as found in the Natomas Basin, may act as partial gene flow barriers (Paquin et al. 2006), resulting in defined population sets with unique adaptive characteristics. Biologists are conducting population dynamics studies of the giant garter snake in the middle-American Basin, which lies north of the NCC (Hansen 2003, 2004, 2006). However, no snakes have been found to move across the NCC itself, suggesting that snakes are not moving between the middle-American Basin and the Natomas Basin. If the NCC represents a barrier to movement within the greater American Basin, then giant garter snakes may be present in two separate and genetically isolated sub-populations, requiring separate conservation and management.

HABITAT CREATION AND MANAGEMENT

New GGS/Drainage Canal

All of the habitat being created for giant garter snakes is required as part of ESA Section 7 consultation. The new GGS/Drainage Canal would provide connectivity of aquatic habitat in the northern and southern Natomas Basin and to managed marsh lands and rice fields. The GGS/Drainage Canal will also function as a movement corridor for the snake to areas that have been isolated from larger habitat areas. This connectivity will increase habitat values for the snake, and make the entire system more functional as water will flow through areas instead of standing areas.

The material excavated to create the new GGS/Drainage Canal will be used to construct the adjacent levee and will be completed prior to filling of the existing canal habitat. This construction sequencing prevents any temporal loss of habitat for the snake. The new canal will also be maintained for the sole purpose of habitat for the giant garter snake, which will increase the value from the current canal, which is operated as an irrigation canal.

Managed Marsh Creation and Rice Preservation

Several soil borrow sites would be finished, graded, and planted with native riparian and marsh vegetation after the completion of borrow activities to create managed seasonal and perennial marsh habitat that would benefit the giant garter snake. Marsh design would follow the templates established by the NBHCP. These design templates feature a combination of uplands and shallow water bodies, sinuosity of swales, and good water control structures to manage precise water levels at different times of the year. Marsh design and management would optimize the value of giant garter snake habitat, but minimize the attraction to wildlife species considered to be potentially hazardous to aircraft at low elevations approaching or departing from runways. An essential component of the managed marshes would be procurement of a firm, reliable water supply and good water quality throughout the giant garter snake active season of April–October. Many marsh areas would be created adjacent to existing NBHCP marsh preserves, thereby providing for greater contiguous management areas and enhancing the overall habitat value of the adjacent preserves.

Large areas of property obtained for the NLIP will also be retained in rice cultivation through an arrangement with a grower or TNBC. Rice fields have become important habitat for giant garter snake, particularly associated canals and their banks for both spring and summer active behavior and winter hibernation. While within the rice fields, snakes forage in the shallow water for prey, utilizing rice plants and vegetated berms dividing rice checks for shelter and basking sites.

Managed Grasslands

Managed grasslands provide foraging habitat for Swainson's hawk (a State listed species). The proposed levee improvements would result in landside slopes that are less steep than the existing slopes, and several reaches of the Sacramento River east levee would have adjoining 100- to 300-foot-wide earthen seepage berms with nearly flat slopes. Grasslands not on levee slopes include those borrow sites on the airport north bufferlands. The primary management objective on managed grasslands would be to reduce hazardous wildlife populations to the extent necessary to comply with Title 14, CFR Part 139 and FAA advisory circulars that address hazardous wildlife. While the grasslands provide habitat for Swainson's hawk, they are an incidental benefit of the slopes, berms, and compliance with the CFR and FAA advisory.

Woodlands

As part of the Fish and Wildlife Coordination Act Report (CAR), woodlands consisting of native species would be established at several sites as a component of the proposed project. These woodlands will provide habitat for Swainson's hawk as well as several birds protected under the Migratory Bird Treaty Act.

Woodland groves would be established throughout the project area, and would generally be at least 50 feet wide and several 100 feet long, depending on location constraints. Portions of the created woodlands would be at least 100 feet wide or wider to promote successful nesting birds deeper within the grove canopy, where next parasitism by crows, cowbirds, and starlings is less of a factor in breeding success.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle is a Federally listed threatened species, protected under ESA. The species is nearly always found on or close to its host plant, elderberry shrub. Many of the shrubs are found throughout the project area. The preferred conservation measure for these shrubs is to transplant them and plant additional seedlings along with associated native plants. All elderberry shrubs located within the project area will be transplanted to the woodland groves or corridor. Additional seedlings will be planted along with the transplants and the woodlands will provide the associated native requirement. This method of planting will meet two requirements: compliance with the biological opinion and compensation recommended in the CAR for woodlands.

ENVIRONMENTAL CONSIDERATIONS OF ALTERNATIVES

The Adjacent Levee Alternative (Proposed Action) was designed to minimize impacts to shaded riverine aquatic (SRA) habitat along the Sacramento River. The SRA is habitat for many State- and Federally-listed fish species and State-listed Swainson's hawk. Although mitigation for State listed species is not necessarily required for a Federal project, these impacts also affect Federally listed species and would be required under Section 7 consultation with NMFS. Construction of the Adjacent Levee alternative (Proposed Action) would allow waterside vegetation to remains due to the shift landward of the levee prism.

Mitigation for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative is very similar, with the exception of loss of riparian habitat due to the removal of waterside trees required under the Fix-in-Place Alternative. This is because the Fix-in-Place Alternative would require the replacement of Garden Highway on top of the levee being brought up to current road standards. The new standards require widening the existing highway to about the same width as the adjacent levee.

During evaluation of borrow sites, consideration was given to using the sites for mitigation once the material was extracted. This allowed the project to be limited to one land purchase, eliminating the need to haul material from a commercial source into the Basin. The sites were evaluated for quality of borrow material, proximity to TNBC lands, connectivity to other habitat, and proximity to placement location. The end result is that material is only handled once, borrow sites are used to mitigate for fish and wildlife impacts, air quality impacts are minimized, and the overall project cost is reduced.

SECTION 7 CONSULTATION AND FISH AND WILDLIFE COORDINATION ACT

A biological assessment has been prepared and coordinated with the resource agencies. ESA Section 7 consultation has been on-going as part of the NLIP. A biological opinion was issued by USFWS (see **Appendix D1**) and a Letter of Concurrence of Determination of Not Likely to Adversely Affect is expected to be issued by NMFS for the Phase 4b Project.

This project will be coordinated with USFWS under the Fish and Wildlife Coordination Act (the Fish and Wildlife Coordination Act Report is included as **Appendix D5**). It is anticipated that all mitigation covered under ESA and CESA consultation will also mitigate any impacts to fish and wildlife resources, and no additional compliance with the biological opinion and 2081 permit would be required.

Table ES-3 displays the potential impacts and mitigation proposed for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. This mitigation reflects what is currently in the biological assessment and has been coordinated with USFWS, NMFS, and DFG.

ES.11.2 SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE ACTION ALTERNATIVES

A significant and unavoidable impact is one that would result in a substantial or potentially substantial adverse effect on the environment and that could not be reduced to a less-than-significant level even with implementation of applicable feasible mitigation.

The following impacts of the Adjacent Levee Alternative (Proposed Action) were found to be significant and unavoidable. Most of these impacts would be temporary and related to construction activities. Where feasible mitigation exists, it has been included to reduce these impacts; however, the mitigation would not be sufficient to reduce the impacts to a less-than-significant level. The following impacts are presented in the order they appear in Chapter 4, "Environmental Consequences and Mitigation Measures."

Table ES-3
Environmental Impacts of and Proposed Mitigation for the NLIP Landside Improvements Project Phase 2–4b Projects

Habitat Type	Potential Impacts (Acres)	Mitigation Ratio	Mitigation Needed (Acres)
Adjacent Levee Alternative (Proposed Action)			
Permanently affected aquatic and rice habitats/managed marsh	201	1:1	201
Woodland (Swainson's hawk)	104	2.6:1	270.4
Upland agriculture (Swainson's hawk)[1]	224.7	1:1	224.7
Shaded riverine aquatic habitat (ESA fish species)	6.21 [2]	3:1	18.63
Lower GGS/Drainage Canal[3]	32.8	1:1	32.8
Fix-in-Place Alternative			
Permanently affected aquatic and rice habitats/managed marsh	201	1:1	201
Woodland (Swainson's hawk)	103	2.6:1	267.8
Upland agriculture (Swainson's hawk)[1]	277	1:1	277
Shaded riverine aquatic habitat (ESA fish species)	42.84 [2]	3:1	128.52
Lower GGS/Drainage Canal[3]	32.8	1:1	32.8

Notes:
[1] Represents approximate acres of affected alfalfa, which is considered high quality foraging habitat and has to be mitigated for on a 1:1 ratio.
[2] Assumes variance from USACE's vegetation guidance is not granted.
[3] Mitigates for impacts to aquatic and upland habitat and Section 404 impacts.
Source: Compiled by AECOM in 2010

- conversion of Important Farmland to nonagricultural uses;
- conflicts with lands under Williamson Act[2] contracts;
- inconsistency with Airport Master Plan, Airport Comprehensive Land Use Plan, and Airport Wildlife Hazard Management Plans;
- inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act;
- potential to physically divide or disrupt an established community;
- loss of landside and waterside woodland and shaded riverine aquatic habitats;
- disruption to and loss of existing wildlife corridors;
- impacts on Swainson's hawk and other special-status birds;

[2] The California Land Conservation Act of 1965 is commonly known as the Williamson Act (California Government Code Section 51200 et seq.).

- potential damage or disturbance to known archaeological or architectural resources from ground-disturbance or other construction-related activities;
- potential damage to or destruction of previously unidentified or undiscovered cultural resources from ground-disturbance or other construction-related activities;
- potential discovery of human remains during construction;
- temporary and short-term increases in traffic on local roadways;
- temporary and short-term increases in traffic hazards on local roadways;
- generation of temporary and short-term construction noise;
- temporary and short-term exposure of residents to increased traffic noise levels from truck hauling associated with borrow activity;
- effects related to the proposed Natomas Levee Class 1 Bike Trail Project (short-term: significant and unavoidable; long-term: less than significant [beneficial]);
- permanent disruption of recreational activities and facilities;
- alteration of scenic vistas, scenic resources, and existing visual character of the project area;
- new sources of light and glare that adversely affect views; and
- aircraft safety hazards resulting from project implementation.

Significant and unavoidable impacts associated with the Fix-in-Place Alternative would be the same as those for the Adjacent Levee Alternative (Proposed Action) with the following additional significant and unavoidable impacts:

- inconsistency with the Natomas Basin Habitat Conservation Plan;
- impacts on Successful Implementation of Habitat Conservation Plans; and
- temporary and short-term exposure of sensitive receptors to, or temporary and short-term generation of, excessive groundborne vibration.

ES.11.3 Cumulative Impacts of the Action Alternatives

Significant cumulative impacts in which no feasible mitigation measures are available to fully reduce significant impacts associated with the Adjacent Levee Alternative (Proposed Action) would be as follows:

- **Agricultural Resources:** Implementation of the Phase 4b Project would involve the permanent conversion of large acreages of Important Farmland (Prime Farmland and Farmland of Statewide Importance), which cannot feasibly be replaced. Historically, agricultural land in the Natomas Basin, much of it Prime Farmland and other categories of Important Farmland, has been converted to residential and commercial development. The Phase 4b Project would contribute to this loss.
- **Fisheries:** The Adjacent Levee Alternative (Proposed Action) would involve removal of a less than of an acre of SRA habitat for pumping plant modifications and as part of raising the west levee of NEMDC North. A variance would be requested for removal of waterside vegetation (including SRA habitat) along NEMDC

South, which would avoid loss of SRA habitat in this area. However, if full compliance with USACE vegetation guidance is required, approximately 11 acres of waterside vegetation (including SRA habitat) would have to be removed from the NEMDC South in a worst-case scenario. Mitigation Measure 4.7-a would require replacement of SRA habitat; however, it may not be possible to create enough suitable SRA habitat to fully compensate for this loss. Historic channel alterations have resulted in marginal habitat conditions that provide only limited habitat functions for most native fish species and other aquatic organisms.

- **Cultural Resources:** Known or unknown archaeological resources could be disturbed, and cultural resources could be potentially damaged or destroyed during construction activities. Although mitigation would be implemented to reduce impacts on potentially significant cultural resources, adverse impacts, particularly on prehistoric archaeological resources, may still occur. This would contribute to a historical trend in the loss of these resources as artifacts of cultural significance and as objects of research importance.

- **Transportation and Circulation:** The Phase 4b Project's construction-related traffic impacts would be temporary, short-term, and intermittent; however, cumulative traffic impacts could be significant if portions of the Phase 4a and 4b Projects are constructed in the same locations during the same time periods.

- **Air Quality:** With implementation of mitigation measures, construction of the Phase 4b Project would result in less-than-significant temporary and short-term construction-related air quality impacts associated with generation of oxides of nitrogen (NO_X), respirable particulate matter less than 10 microns in diameter (PM_{10}) (including fine particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), and volatile organic compounds (VOC), even. However, other medium-sized and large reasonably foreseeable projects, such as the anticipated developments in the Natomas area, would contribute substantially to air quality impacts. Taken together, the Phase 4b Project would contribute to air pollutant emissions in Sutter and Sacramento Counties, and to the nonattainment status of the Feather River Air Quality Management District (FRAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD) for ozone and PM_{10}.

- **Noise:** The Phase 4b Project would have a significant and unavoidable project-level impact on noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic. This impact would be further exacerbated by the potential overlap in construction of the Phase 4a and 4b Projects.

- **Visual Resources:** The Phase 4b Project would include the removal of trees, including Heritage oaks, other vegetation, and structures from the landside of the Sacramento River east levee within the footprint of the adjacent levee and berms, and may include the removal of some vegetation from the waterside of the Sacramento River east levee. These changes would contribute to the substantial degradation of scenic resources in the Natomas Basin that are expected to result with various development projects and expansion of Airport facilities, as the area's visual character changes from rural agricultural landscape to urban/suburban setting. Although the Phase 4b Project includes the establishment of a substantial acreage of woodland plantings around the Basin to offset the significant effect of the project on scenic resources (oak and other native trees), the plantings would require decades to become well established and up to 100 years to replace Heritage oaks. Construction of an adjacent levee, in combination with removal of woodlands along the landside of the Sacramento River east levee, would substantially alter the existing visual character of the Natomas Basin and surrounding areas. Not only would the setback levee result in a physical barrier to the existing viewshed, tree removal would degrade the visual coherence of the project area.

In addition to the above significant cumulative impacts, implementation of the Fix-in-Place Alternative would also result in the following significant cumulative impacts:

- **Fisheries:** As noted above for the Adjacent Levee Alternative (Proposed Action) a variance would be requested for removal of waterside vegetation (including SRA habitat) along NEMDC South, which would avoid loss of SRA habitat in this area. However, if full compliance with USACE vegetation guidance is

required, approximately 11 acres of waterside vegetation (including SRA habitat) would have to be removed from the NEMDC South in a worst-case scenario. The Fix-in-Place Alternative would involve removal of 19 additional acres of vegetation (including SRA habitat) along the waterside of Sacramento River east levee Reach A:16–20 to comply with USACE vegetation guidance (for a total of 30 acres removed). Mitigation Measure 4.7-a would require replacement of SRA habitat; however, it may not be possible to create enough suitable SRA habitat to compensate for this loss. Historic channel alterations have resulted in marginal habitat conditions that provide only limited habitat functions for most native fish species and other aquatic organisms.

- **Terrestrial Biological Resources:** The narrower landside levee footprint of the Fix-in-Plaee Alternative would avoid some losses of woodland and grassland habitat that would be unavoidable under the Adjacent Levee Alternative (Proposed Action); however, under the Fix-in-Place Alternative, as much as 21acres of riparian woodland on the waterside of the levee in Reaches B:10–15 of the Sacramento River east levee could be removed to conform with USACE guidance regarding levee encroachments. In addition to its overall value as habitat for various species, this woodland supports active Swainson's hawk nests, elderberry shrubs, and other important biological resources. Adverse impacts on these resources on the waterside of the levee would be more difficult to mitigate than the adverse impacts from the adjacent levee footprint on the landside of the levee under the Adjacent Levee Alternative (Proposed Action), both in terms of the acreage of habitat lost and the quality of that habitat. Implementation of this alternative would include minimization, avoidance, and compensation measures in accordance with ESA and CESA requirements, and other relevant regulatory requirements; however, it is uncertain whether adequate compensation could be developed for the extensive loss of mature waterside vegetation under this alternative.

- **Visual Resources:** The Fix-in-Place Alternative would result in similar impacts to visual resources as the Adjacent Levee Alternative (Proposed Action) except that the Sacramento River east levee would be widened in place, requiring greater removal of riparian woodlands on the waterside of these levee reaches to conform with USACE guidance regarding levee encroachments. Therefore, the Fix-in-Place Alternative would result in the loss of high-aesthetic-value woodlands along the waterside of the levee. Because the replacement plantings that are part of the Phase 4b Project would be planted along the landside of the levee, and mitigation is not available to fully compensate for the loss of waterside vegetation (including SRA habitat).

ES.12 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

ES.12.1 AREAS OF CONTROVERSY

Based on the comments received during the scoping period and the history of the NEPA and CEQA processes undertaken by USACE and SAFCA, respectively, the major areas of public controversy associated with the project are:

- temporary, construction-related effects (especially noise and access issues) on residents and businesses adjacent to the project levees (including the potential for construction to continue 24 hours per day, 7 days per week [24/7 construction]);
- the hydraulic modeling used to analyze the project's hydraulic impacts;
- construction-related impacts on cultural and biological resources;
- vegetation and tree removal and relocation of utilities, including power poles;
- removal of agricultural lands and loss of opportunity for future development; and
- SAFCA's ability to fund mitigation measures.

The first two issues were the subject of a lawsuit, filed in December 2007, by the Garden Highway Community Association challenging the Phase 2 EIR prepared by SAFCA, which was settled. A copy of the settlement agreement is included as **Appendix A3**, and applies to all affected Garden Highway residents. Many of the agreements made by SAFCA in this settlement agreement regarding construction practices also have been incorporated into the Phase 3–4a Projects or, as appropriate, in the mitigation measures for those project phases. SAFCA intends to voluntarily apply the design and construction provisions in the agreement to all Sacramento River east levee components of the Phase 4b Project in the event that SAFCA chooses to implement the Phase 4b Project without Federal participation. While USACE is not bound by the settlement agreement, USACE nevertheless plans to implement some of the measures contained therein; these measures are incorporated into the project or reflected, as appropriate, in the mitigation measures in this EIS/EIR.

Other issues, including potential 24/7 construction, vegetation and tree removal, relocation of utilities (including power poles), and impacts to agricultural lands have been raised in comment letters by affected property owners. USACE and SAFCA have and will continue to respond to these issues, most recently in responses to comments on the Phase 4a FEIS and FEIR. Additionally, USACE and SAFCA continue to work individually with these property owners to respond to concerns.

Allegations regarding construction-related impacts on cultural and biological resources and SAFCA's ability to fund mitigation measures were the subject of a Petition for Writ of Mandate and Complaint for Injunctive Relief (Petition) filed in March 2009 by the Garden Highway Community Association challenging the adequacy of the Phase 2 Supplemental EIR under CEQA. This suit was voluntarily dismissed on October 22, 2009. In June 2009, both the Garden Highway Community Association and the Association for the Environmental Preservation of the Garden Highway filed Petitions challenging certification of the Phase 3 EIR. Both petitions made allegations similar to those contained in the 2007 and March 2009 lawsuits, including the issues described above. In July 2009, the Association for the Environmental Preservation of the Garden Highway dismissed its lawsuit challenging the Phase 3 EIR.

In December 2009, both the Garden Highway Community Association and the Association for the Environmental Preservation of the Garden Highway filed Petitions challenging certification of the Phase 4a EIR.

If USACE receives Congressional authorization and implements the Phase 4b Project, the issue of SAFCA's ability to fund proposed mitigation measures would no longer be an issue.

ES.12.2 Issues to be Resolved

Congress will consider approval of USACE's Common Features/Natomas PACR, which includes authorization for USACE to construct the Phase 4b Project.

In the event Congress does not authorize USACE to construct the Phase 4b Project, and SAFCA chooses to proceed with the Phase 4b Project without additional Federal participation, USACE will consider the Adjacent Levee Alternative (Proposed Action) and either grant or deny permission for the Phase 4b Project pursuant to Sections 408, 404, and 10.

SAFCA will consider whether or not to certify the EIR and approve the Phase 4b Project. This decision will be based on numerous factors, including the potential environmental impacts and mitigation measures addressed in this EIS/EIR, permitting requirements, Federal and state authorizations, funding and financing mechanisms, and implementation schedule.

ES.13 HISTORY OF AND NEXT STEPS IN THE NEPA/CEQA PROCESS

USACE published a notice of intent (NOI) to prepare the American River Common Features GRR in the *Federal Register* (Vol. 73, No. 41) on February 29, 2008. Because the Common Features/Natomas PACR/Phase 4b Project is a component of the Common Features GRR, a separate NOI for the Common Features/Natomas PACR/Phase 4b Project does not need to be published.

On November 5, 2009, SAFCA filed a notice of preparation (NOP) for this EIS/EIR with the State Clearinghouse, and distributed copies of the NOP to approximately 900 recipients. A joint NEPA/CEQA public scoping meeting was held on November 18, 2009 from 4:30 to 6:30 p.m. at the South Natomas Community Center in Sacramento, California, to brief interested parties on the Common Features/Natomas PACR/Phase 4b Project and obtain the views of agency representatives and the public on the scope and content of this EIS/EIR.

The DEIS/DEIR was distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. The review period began on July 2, 2010 and closed on August 16, 2010. Four public meetings were held during the review period. In addition, written comments from the public, reviewing agencies, and stakeholders were accepted throughout the public comment period. These comments, along with the written responses to those comments, are contained in **Appendix I**, "Responses to Comments on the DEIS/DEIR," of this FEIS/FEIR. Corrections, revisions, additions, and/or deletions to the text of the DEIS/DEIR are provided in **Appendix I**. Deleted text is shown in ~~strikeout~~ and added text is shown in underline. These text revisions are not shown in the FEIS/FEIR as changes; the FEIS/FEIR contains a clean reprint of the document.

This FEIS/FEIR will be distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. NEPA requires a 30-day public review for an FEIS, whereas CEQA requires a 10-day (for commenting agencies only) review for an FEIR. For this FEIS/FEIR, the NEPA and CEQA review periods will run concurrently, with the CEQA review period ending before the NEPA review period.

After the CEQA review period, the SAFCA Board of Directors will consider certifying the EIR if it is determined to be in compliance with CEQA, and will rely on the certified EIR when considering project approval.

After the NEPA review period, USACE will consider the Phase 4b Project and issue its ROD. The ROD will identify USACE's decision regarding the alternatives considered, address substantive comments received on the FEIS, and determine whether the Adjacent Levee Alternative (Proposed Action) complies with Sections 408, 404, and 10.

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Agricultural Resources						
Impact 4.2-a: Conversion of Important Farmland to Non-agricultural Uses	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action)	Permanent and Temporary	Permanent: 851.70 acres Temporary: 355.65 acres	Significant	Mitigation Measure 4.2-a: Minimize Important Farmland Conversion to the Extent Practicable and Feasible	Significant and Unavoidable
	Fix-in-Place Alternative	Permanent and Temporary	Permanent: 849.92 acres Temporary: 355.65 acres	Significant	Implement Mitigation Measure 4.2-a	Significant and Unavoidable
Impact 4.2-b: Conflict with Lands under Williamson Act Contracts	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	42.14 active acres and 22.57 non-renewal acres	Significant	Mitigation Measure 4.2-b: Minimize Impacts on Agricultural Preserve Land and Williamson Act–Contracted Land; Comply with California Government Code Sections 51290–51293; and Coordinate with Landowners and Agricultural Operators	Significant and Unavoidable

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Land Use, Socioeconomics, and Population and Housing						
Impact 4.3-a: Inconsistency with Airport Master Plan, Airport Comprehensive Land Use Plan, and Airport Wildlife Hazard Management Plans	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	Consistent	No mitigation is required	Consistent
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Not Applicable	Not Applicable	Potentially Inconsistent	Mitigation Measure 4.3-a: Implement Mitigation Measure 4.16-g, "Consult with SCAS and the FAA during Design of the Proposed Natomas Levee Class I Bike Trail to Implement Appropriate Airport Safety Precautions"	Significant and Unavoidable
Impact 4.3-b: Inconsistency with the Natomas Basin Habitat Conservation Plan	No-Action Alternative: No Phase 4b Project Construction and Potential Levee Failure	Not Applicable	Not Applicable	Consistent	No mitigation is required	Consistent
	Adjacent Levee Alternative (Proposed Action)	Permanent	See quantified impacts under "Biological Resources"	Potentially Inconsistent	Mitigation Measure 4.3-b: Implement Mitigation Measure 4.7-l, "Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-l"	Consistent
	Fix-in-Place Alternative	Permanent	See quantified impacts under "Biological Resources"	Inconsistent	Implement Mitigation Measure 4.3-b	Significant and Unavoidable

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.3-c: Inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	Potentially Inconsistent	No mitigation is required	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Not Applicable	Not Applicable	Potentially Inconsistent (if USACE requires removal of waterside vegetation from the American River north levee)	No mitigation is available	Significant and Unavoidable
Impact 4.3-d: Potential to Physically Divide or Disrupt an Established Community	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary and Permanent	Temporary construction-related access issues and traffic impacts; and permanent acquisition of 30 residences (23 residences under the Fix-in-Place Alternative), 3 mobile homes, 2 farm residences, and 1 business (partial acquisition)	Significant	Mitigation Measure 4.3-d: Notify Residents and Businesses of Project Construction and Road Closure Schedules; and Implement Mitigation Measures 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and 4.10-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"	Significant and Unavoidable
Impact 4.3-e: Displacement of Residences and Businesses	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Not Applicable	Not Applicable	Less than Significant	No mitigation is required	Less than Significant
Geology, Soils, and Mineral Resources						
Impact 4.4-a: Potential Temporary Localized Soil Erosion during Construction	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.4-a(1): Implement Mitigation Measure 4.6-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions" Mitigation Measure 4.4-a(2): Secure and Implement the Conditions of the California Surface Mining and Reclamation Act Permit or Exemption	Less than Significant
Impact 4.4-b: Potential Soil Erosion During Project Operations	No-Action Alternative: No Phase 4b Project Construction and Potential Levee Failure	Not Applicable	Not Applicable	Potentially Significant	No mitigation is required	Significant and Unavoidable
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Unquantifiable	Less than Significant (Beneficial)	No mitigation is required	Less than Significant (Beneficial)
Impact 4.4-c: Potential Loss of Mineral Resources	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Hydrology and Hydraulics						
Impact 4.5-a: Hydraulic Impacts on Other Areas and Exposure to Flood Risk	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary or Permanent	Continued high risk of flooding	Significant	No feasible mitigation is available	Significant and Unavoidable
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Substantially reduced risk of flooding; no hydraulic impacts	Less than Significant (Beneficial)	No mitigation is required	Less than Significant (Beneficial)
Impact 4.5-b: Alteration of Local Drainage	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary or Permanent	Unknown	Potentially Significant	Mitigation Measure 4.5-b(1): Coordinate with Landowners and Drainage Infrastructure Operators, Prepare Final Drainage Studies as Needed, and Implement Proper Project Design Mitigation Measure 4.5-b(2): Prepare Hydraulic Study, and Design and Implement Lower Dry Creek Woodland Planting Areas to Avoid Adverse Hydraulic Effects	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.5-c: Effects on Groundwater	No-Action Alternative; No Phase 4b Project Construction and Potential Levee Failure	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	No substantial decrease in groundwater levels or well yields or increase in pumping costs is expected	Less than Significant	No mitigation is required	Less than Significant
Water Quality						
Impact 4.6-a: Temporary Impacts on Water Quality from Stormwater Runoff, Erosion, or Spills	No-Action Alternative; No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.6-a: Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions	Less than Significant
Impact 4.6-b: Impacts to Sacramento River Water Quality from Pleasant Grove Creek Canal Detention Basin Discharges	No-Action Alternative; No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.6-b: Implement Best Management Practices and Comply with NPDES Permit Conditions for a Point-Source Discharge	Less than Significant
Impact 4.6-c: Effects on Water Quality from Groundwater Discharged by Relief Wells	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary	Unquantifiable	Too Speculative	No feasible mitigation is available	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.6-c: Conduct Groundwater Quality Tests, Notify the Central Valley RWQCB, and Comply with the Central Valley RWQCB's Waste Discharge Requirements and NPDES Permit	Less than Significant
Biological Resources						
Impact 4.7-a: Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats	No-Action Alternative: No Phase 4b Project Construction	Permanent	Loss of approximately 35 acres (9.05 landside acres and 25.89 waterside acres) to conform with USACE guidance regarding levee encroachments	Potentially Significant	No feasible mitigation is available	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action)	Temporary and Permanent	Loss of approximately 43 acres (35.99 landside acres and 7.32 waterside acres)	Significant	Mitigation Measure 4.7-a: Minimize Effects on Woodland Habitat, Implement Woodland Habitat Improvements and Management Agreements, Compensate for Loss of Habitat, and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code	Significant and Unavoidable (short-term) Less than Significant (long-term)
	Fix-in-Place Alternative	Temporary and Permanent	Loss of approximately 61 acres (34.79 landside acres and 26.52 waterside acres)	Significant	Implement Mitigation Measure 4.7-a	Significant and Unavoidable
Impact 4.7-b: Disruption to and Loss of Existing Wildlife Corridors	No-Action Alternative: No Phase 4b Project Construction	Permanent	Loss of approximately 35 acres (9.05 landside acres and 25.89 waterside acres) to conform with USACE guidance regarding levee encroachments	Potentially Significant	No feasible mitigation is available	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

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Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Temporary disturbance and permanent loss of canals, ditches, and their associated habitat values	Significant	Mitigation Measure 4.7-b: Implement Mitigation Measures 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code," and 4.7-e, "Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Improvements and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, and Obtain Incidental Take Authorization"	Significant and Unavoidable
4.7-c: Direct and Indirect Impacts to Jurisdictional Waters of the United States	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action)	Temporary and Permanent	Temporary: 324 acres Permanent: 199 acres	Potentially Significant	Mitigation Measure 4.7-c: Minimize Effects on Jurisdictional Waters of the United States; Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled or Dewatered; and Comply with Section 404, Section 401, Section 10, and Section 1602 Permit Processes	Less than Significant (Beneficial)
	Fix-in-Place Alternative	Temporary and Permanent	Temporary: 324 acres Permanent: 199 acres	Potentially Significant	Implement Mitigation Measure 4.7-c	Less than Significant (Beneficial)

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
4.7-d: Potential Loss of or Disturbance to Special-Status Plant Species and Their Habitats	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	No special-status plant species found; however additional surveys are needed	Potentially Significant	Mitigation Measure 4.7-d: Minimize Impacts on Special-Status Plant Species	Less than Significant
4.7-e: Giant Garter Snake Mortality, Injury, and/or Disturbance to Habitat	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Approximately 23 acres of canal/ditch and 259 acres of rice	Potentially Significant	Mitigation Measure 4.7-e: Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Improvements and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, and Obtain Incidental Take Authorization	Less than Significant
4.7-f: Impacts on Swainson's Hawk and Other Special Status Birds	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Foraging impacts: unknown, but potentially substantial Nesting impacts: 110.77 acres	Potentially Significant	No feasible mitigation is available	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action)	Permanent	Foraging impacts: 253 acres Nesting impacts: 91.21 acres	Potentially Significant	Mitigation Measure 4.7-f: Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Implement All Upland and Agricultural Habitat Improvements and Management Agreements to Compensate for Loss of Quantity and Quality of Foraging Habitat, Obtain Incidental Take Authorization, and Implement Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat, Implement all Woodland Habitat Improvements and Management Agreements, Compensate for Loss of Habitat, and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code"	Significant and Unavoidable
	Fix-in-Place Alternative	Permanent	Foraging impacts: 251 acres Nesting impacts: 145.52 acres	Potentially Significant	Implement Mitigation Measure 4.7-f	Significant and Unavoidable
4.7-g: Potential Loss and/or Direct Impact of Elderberry Shrubs and/or Potential Loss of Valley Elderberry Longhorn Beetle	No-Action Alternative: No Phase 4b Project Construction	Permanent	Unknown	Potentially Significant	No feasible mitigation is available	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not applicable	Unquantifiable	Too Speculative	No mitigation is required	Significant and Unavoidable

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action)	Permanent	Unknown	Potentially Significant	Mitigation Measure 4.7-g: Conduct Focused Surveys for Elderberry Shrubs as Needed, Implement All Woodland Habitat Improvements and All Management Agreements, Ensure Adequate Compensation for Loss of Shrubs, and Obtain Incidental Take Authorization	Less than Significant
4.7-h: Impacts on Northwestern Pond Turtle and Burrowing Owl	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Approximately 23 acres of canal/ditch	Potentially Significant	Mitigation Measure 4.7-h: Conduct Focused Surveys for Northwestern Pond Turtles, Relocate Turtles, Minimize Potential Impacts on Burrowing Owls, and Relocate Owls as Needed	Less than Significant
4.7-i: Disturbance to Special-Status Vernal Pool Crustaceans	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary and Permanent	Unquantifiable	Potentially Significant	Mitigation Measure 4.7-i: Survey for Presence or Absence of Vernal Pool Invertebrates, Avoid Disrupting Vernal Pool Habitat, and Implement Measures to Mitigate Loss of Habitat	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
4.7-j: Temporary Construction-related Impacts to Fish and Aquatic Habitats	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary and Permanent	Unquantifiable	Potentially Significant	Mitigation Measure 4.7-j: Implement Mitigation Measure 4.6-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, Prepare and Implement a Spill Containment Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions;" Implement a Feasible Construction Work Window that Minimizes Impacts to Special-Status Fish Species for Any In-Water Activities; and Implement Operational Controls and a Fish Rescue Plan that Minimizes Impacts to Fish Associated with Cofferdam Construction and Dewatering	Less than Significant
4.7-k: Impacts to Fish Species Associated with Operation of Pumping Plants and Surface Drains	No-Action Alternative: No Phase 4b Project Construction	Temporary or Permanent	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary or Permanent	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
4.7-1: Impacts on Successful Implementation of Habitat Conservation Plans	No-Action Alternative: No Phase 4b Project Construction	Permanent	See Impacts 4.7-a and 4.7-c through 4.7-h	Significant	No feasible mitigation is available	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Not Applicable	Less than Significant	No mitigation is required	Less than Significant
	Adjacent Levee Alternative (Proposed Action)	Permanent	See Impacts 4.7-a and 4.7-c through 4.7-h	Significant	Mitigation Measure 4.7-1: Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h	Less than Significant
	Fix-in-Place Alternative	Permanent	See Impacts 4.7-a and 4.7-c through 4.7-h	Significant	Implement Mitigation Measure 4.7-1	Significant and Unavoidable
Cultural Resources						
Impact 4.8-a: Potential Changes to Elements of Reclamation District 1000 and the Rural Landscape District	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Permanent	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Unquantifiable	Potentially Significant	Mitigation Measure 4.8-a: Incorporate Mitigation Measures to Documents Regarding Any Elements Contributing to RD 1000 and Rural Landscape District and Distribute the Information to the Appropriate Repositories	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.8-b: Potential Damage or Disturbance to Known Archaeological or Architectural Resources from Ground-Disturbance or Other Construction-Related Activities	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Permanent	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Two prehistoric archaeological deposits, an historic farmstead, and an historic archaeological deposit	Potentially Significant	Mitigation Measure 4.8-b: Avoid Ground Disturbance Near Eligible and Listed Resources to the Extent Feasible, Prepare a Finding of Effect, and Resolve Any Adverse Effects through Preparation of an HPTP	Significant and Unavoidable
Impact 4.8-c: Potential Damage to or Destruction of Previously Unidentified or Undiscovered Cultural Resources from Ground-Disturbance or Other Construction-Related Activities	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Unquantifiable	Potentially Significant	Mitigation Measure 4.8-c: Train Construction Workers before Construction, Monitor Construction Activities, Stop Potentially Damaging Activities, Evaluate Any Discoveries, and Resolve Adverse Effects on Eligible Resources, if Encountered	Significant and Unavoidable

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.8-d: Potential Discovery of Human Remains during Construction	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.8-d: Stop Work Within An Appropriate Radius Around the Find, Notify the Applicable County Coroner and Most Likely Descendant, and Treat Remains in Accordance with State Law and Measures Stipulated in an HPTP Developed in Consultation between the Project Proponent(s) and the SHPO	Significant and Unavoidable
Paleontological Resources						
Impact 4.9-a: Disturbance of Unknown Unique Paleontological Resources during Earthmoving Activities	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Permanent	Not Applicable	Less than Significant	No mitigation is required	Less than Significant
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Unquantifiable	Potentially Significant	Mitigation Measure 4.9-a: Conduct Construction Personnel Training and, if Paleontological Resources are Found, Stop Work Near the Find and Implement Mitigation in Coordination with a Professional Paleontologist	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Transportation and Circulation						
Impact 4.10-a: Temporary and Short-Term Increases in Traffic on Local Roadways	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action)	Temporary	Haul trips per day: 540 for Sacramento River east levee Reach A:16–19A, 360 for Sacramento River east levee Reach A:19B–20, 120 for American River north levee Reach I:1–4, 810 for west levee of NEMDC North (Reaches F–G), and 566 for west levee of PGCC (Reach E); temporary and short-term road closures, lane closures, and traffic controls, specifically closure of Garden Highway and the Arden-Garden Connector	Significant	Mitigation Measure 4.10-a: Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips	Significant and Unavoidable

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Fix-in-Place Alternative	Temporary	Same as the Proposed Action except 960 haul trips for Sacramento River east levee (7% greater than the Proposed Action)	Significant	Implement Mitigation Measure 4.10-a	Significant and Unavoidable
Impact 4.10-b: Temporary and Short-Term Increases in Traffic Hazards on Local Roadways	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Reconstruction of multiple Garden Highway intersections and private parcel ramps; slowed traffic due to haul truck traffic; and road and lane closures (see Impact 4.10-a)	Significant	Mitigation Measure 4.10-b: Implement Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips."	Potentially Significant and Unavoidable
Impact 4.10-c: Temporary and Short-Term Disruption of Emergency Service Response Times and Access	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Numerous temporary road closures and detours; and road and lane closures (see Impact 4.10-a)	Potentially Significant	Mitigation Measure 4.10-c: Implement Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips"	Less than Significant
Impact 4.10-d: Conflict with Adopted Policies, Plans, or Programs Supporting Alternative Transportation	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Multiple road and lane closures (see Impact 4.10-a) affecting existing and planned bicycle routes	Significant	Mitigation Measure 4.10-d: Prepare and Implement a Bicycle Detour Plan for Project Area Roadways and Bike Trails, Including Garden Highway and the NEMDC Levees	Less than Significant
Air Quality						
Impact 4.11-a: Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} during Construction	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action)	Temporary	Total maximum mitigated emissions (combined Phase 4a and 4b Projects) in Sacramento County: ROG 78 lb/day NO_X 530 lb/day	Significant	Mitigation Measure 4.11-a: Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
			PM_{10} 99 lb/day Sutter County: ROG 317 lb/day NO_X 114 lb/day PM_{10} 26 lb/day			
	Fix-in-Place Alternative	Temporary	Total maximum mitigated emissions (combined Phase 4a and 4b Projects) in Sacramento County: ROG 78 lb/day NO_X 530 lb/day PM_{10} 81 lb/day Sutter County: ROG 17 lb/day NO_X 114 lb/day PM_{10} 26 lb/day	Significant	Implement Mitigation Measure 4.11-a	Less than Significant
Impact 4.11-b: General Conformity with the Applicable Air Quality Plan	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Mitigation would reduce impacts to the Federal *de minimis* thresholds	Less than Significant	No mitigation is required	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.11-c: Long-Term Changes in Emissions of ROG, NO_X, and PM_{10} Associated with Project Implementation	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant
Impact 4.11-d: Exposure of Sensitive Receptors to Toxic Air Emissions	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant
Noise						
Impact 4.12-a: Generation of Temporary and Short-Term Construction Noise	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary	Unquantifiable	Less than Significant	No feasible mitigation is available	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	79–90 dBA without feasible noise control (50 feet from nearest noise source); highest noise level would be 77.9 dBA L_{eq} (100 feet from construction activities)	Significant	Mitigation Measure 4.12-a: Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors	Significant and Unavoidable
Impact 4.12-b: Temporary and Short-term Exposure of Sensitive Receptors to, or Temporary and Short-term Generation of, Excessive Groundborne Vibration	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary	Unquantifiable	Less than Significant	No feasible mitigation is available	Less than Significant
	Adjacent Levee Alternative (Proposed Action)	Temporary	0.089 in/sec PPV or 87 VdB (for bulldozers)	Significant	Mitigation Measure 4.12-b: Implement Vibration-Reducing Construction Practices, Prepare and Implement a Groundborne Vibration Control Plan, and Monitor and Record Construction Groundborne Vibration Near Sensitive Receptors	Less than Significant
	Fix-in-Place Alternative	Temporary	0.089 in/sec PPV or 87 VdB (for bulldozers)	Significant	Implement Mitigation Measure 4.12-b	Significant and Unavoidable
Impact 4.12-c: Temporary and Short-term Exposure of Residents to Increased Traffic Noise Levels from Truck Hauling Associated With Borrow Activity	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	66.4 dBA L_{eq} (50 feet from roadway centerline), resulting in interior noise levels of 41.4 dBA L_{eq}	Potentially Significant	Mitigation Measure 4.12-c: Implement Noise-Reduction Measures to Reduce the Impacts of Haul Truck Traffic Noise	Significant and Unavoidable
Impact 4.12-d: Long-Term Increases in Project-Generated Noise	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	78–88 dBA 3–5 feet away; meets compliance standards	Less than Significant	No mitigation is required	Less than Significant
Impact 4.12-e: Temporary and Short-Term Exposure of People Working in the Project Area to Excessive Airport Noise Levels	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Temporary	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Would not exceed Airport noise threshold levels	Less than Significant	No mitigation is required	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Recreation						
Impact 4.13-a: Effects Related to the Proposed Natomas Levee Class 1 Bike Trail Project	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary and Permanent	Unquantifiable	Significant	No feasible mitigation is available	Short-Term: Significant and Unavoidable Long-Term: Less than Significant (Beneficial)
Impact 4.13-b: Permanent Disruption of Recreational Activities and Facilities	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	Significant	No mitigation is required	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Permanent encroachment on City parks, nature preserves, a private golf course, and an off-street bikeway	Significant	Mitigation Measure 4.13-b: Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities	Significant and Unavoidable

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Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.13-c: Temporary Changes in Recreational Opportunities during Project Construction Activities	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Temporary encroachment on City parks, nature preserves, a private golf course, and an off-street bikeway	Significant	Mitigation Measure 4.13-c(1): Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair of Damage to Recreational Facilities Mitigation Measure 4.13-c(2): Provide Construction Period Information on Recreational Facility Closures and Detours and Provide Detours for Alternate Routes to Marinas	Less than Significant
Visual Resources						
Impact 4.14-a: Alteration of Scenic Vistas, Scenic Resources, and Existing Visual Character of the Project Area	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	Potentially Significant	No mitigation is required	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Permanent	Tree removal is quantified under "Biological Resources"; other visual impacts are unquantifiable	Significant	Mitigation Measure 4.14-a: Implement Mitigation Measures 4.7-a, "Minimize Effects on Woodland Habitat; Implement all Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act,	Significant and Unavoidable

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
					Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions," and 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities"	
Impact 4.14-b: New Sources of Light and Glare that Adversely Affect Views	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Significant	Mitigation Measure 4.14-b: Direct Lighting Away from Adjacent Properties	Significant and Unavoidable
Utilities and Service Systems						
Impact 4.15-a: Potential Temporary Disruption of Irrigation Water Supply	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.15-a: Coordinate with Irrigation Water Supply Users Before and During All Irrigation Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.15-b: Potential Disruption of Utility Service	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.15-b: Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage	Less than Significant
Impact 4.15-c: Increases in Solid Waste Generation	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Up to 100,000 cy solid waste; would not exceed remaining capacity	Less than Significant	No mitigation is required	Less than Significant
Hazards and Hazardous Materials						
Impact 4.16-a: Accidental Spills of Hazardous Materials	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary or Permanent	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant
Impact 4.16-b: Potential Land Use Constraints Due to Contamination within the Pumping Plant No. 8 Footprint and Potential Exposure of Construction Workers and the General Public to Contaminated Groundwater	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.16-b: Cooperate with Olympian Oil and Regulatory Agencies to Preserve, Modify, or Close Existing Groundwater Monitoring Wells at the Olympian Oil Site	Less than Significant
Impact 4.16-c: Potential Exposure of Construction Workers and the General Public to Hazardous Materials Encountered at Project Sites	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	Potentially Significant	No mitigation is required	Significant and Unavoidable
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.16-c(1): Complete Recommendations Included in Phase I and/or II ESAs and Implement Required Measures Mitigation Measure 4.16-c(2): Complete Phase I and/or II ESAs, Soil, and/or Groundwater Investigations in Phase 4b Project Footprint Areas	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
					Not Covered by the Existing Phase I and/or II ESAs, and Implement Required Measures (e.g., Site Management and/or Other Contingency Plans)	
Impact 4.16-d: Interference with an Adopted Emergency Evacuation Plan	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Significant	Mitigation Measure 4.16-d: Implement Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and Mitigation Measure 4.10-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"	Less than Significant
Impact 4.16-e: Possible Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Seven schools are located within one-quarter mile of the Phase 4b Project footprint	Significant	Mitigation Measure 4.16-e: Notify the Natomas Unified School District and Affected Schools within One-Quarter Mile of Project Construction Activities	Less than Significant

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Impact 4.16-f: Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Less than Significant	No mitigation is required	Less than Significant
Impact 4.16-g: Aircraft Safety Hazards Resulting from Project Implementation	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.16-g: Consult with SCAS and the FAA during Design of the Proposed Natomas Levee Class I Bike Trail to Implement Appropriate Airport Safety Precautions	Significant and Unavoidable
Impact 4.16-h: Potential Exposure to Wildland Fires	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative

Table ES-2
Summary of Impacts and Mitigation Measures

Resource Topic/Impact	Alternative	Duration of Impact	Quantification of Impact (Where Applicable)	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary	Unquantifiable	Potentially Significant	Mitigation Measure 4.16-h: Prepare and Implement a Fire Management Plan to Minimize Potential for Wildland Fires	Less than Significant
Environmental Justice						
Impact 4.17-a: Potential to Have a Disproportionate High and Adverse Environmental Impact on any Minority or Low-Income Populations	No-Action Alternative: No Phase 4b Project Construction	Not Applicable	Not Applicable	No Impact	No mitigation is required	No Impact
	No-Action Alternative: Potential Levee Failure	Not Applicable	Unquantifiable	Too Speculative	No mitigation is required	Too Speculative
	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Temporary and Permanent	Unquantifiable	Significant	Mitigation Measure 4.17-a: Increase the Direct Benefits of the Project for the Ancestors of the Native American Tribes	Less than Significant

1 INTRODUCTION AND STATEMENT OF PURPOSE AND NEED

1.1 INTRODUCTION

This document is a joint environmental impact statement/environmental impact report (EIS/EIR) that has been prepared by both the U.S. Army Corps of Engineers (USACE), Sacramento District as Federal lead agency under the National Environmental Policy Act (NEPA) and the Sacramento Area Flood Control Agency (SAFCA) as state lead agency under the California Environmental Quality Act (CEQA). See Code of Federal Regulations (CFR), Title 40, Sections 1502.25, 1506.2, and 1506.4 (authority for combining Federal and state environmental documents) and California Code of Regulations (CCR), Title 14, Division 6, Chapter 3 (State CEQA Guidelines), CCR Section 15222 ("Preparation of Joint Documents"). See also 33 CFR Part 230 (USACE NEPA regulations) and 33 CFR Part 325, Appendix B ("NEPA Implementation Procedures for the [USACE] Regulatory Program").

This final EIS/final EIR (FEIS/FEIR) has been prepared to respond to significant environmental comments received on the draft EIS/draft EIR (DEIS/DEIR) on SAFCA's Natomas Levee Improvement Program (NLIP), Phase 4b Landside Improvements Project (Phase 4b Project) that was issued for public review on July 2, 2010. This FEIS/FEIR constitutes a reprint of the entire DEIS/DEIR, and provides responses to comments on the Phase 4b DEIS/DEIR (Appendix I). This FEIS/FEIR should be used as the informational basis for addressing the environmental impacts of implementing the Phase 4b Project, and will be submitted to Congress in late 2010 to support approval of USACE's American River Watershed Common Features Project/Natomas Post-authorization Change Report (Common Features/Natomas PACR), which is an element of the American River Watershed Common Features Project General Re-evaluation Report (Common Features GRR). The Common Features/Natomas PACR includes all four project phases (1, 2, 3, and 4a and 4b) of the Landside Improvements Project, which is a component of the NLIP. These project phases are summarized in Section 1.5, "Environmental Regulatory Framework and Relationship of this EIS/EIR to Other Documents." This EIS/EIR summarizes environmental analyses for all previously approved project phases, as well as previously released public draft documents of the Landside Improvements Project, including alternatives previously considered, analyzed, and rejected from further consideration, and evaluates at a project-level the environmental effects of the proposed Phase 4b Project (Proposed Action/Proposed Project), hereinafter referred to as "the project." This EIS/EIR evaluates project alternatives, and includes mitigation to reduce, minimize, or avoid, where feasible, any significant and potentially significant adverse impacts. This information will become part of the overall request for congressional review and approval of the Common Features/Natomas PACR.

1.1.1 SCOPE OF ENVIRONMENTAL ANALYSIS

The overall purpose of the multi-phase NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas through a program of proposed levee improvements to address levee height deficiencies, levee seepage potential, and streambank erosion conditions along the Natomas Basin perimeter levee system. The Landside Improvements Project, which is a component of the NLIP, consists of four phases (1, 2, 3, and 4a and 4b). The Phase 1 Project was completed by SAFCA in 2008. The Phase 2 Project was analyzed in previous environmental documents (see Section 1.5.4.2, below) and is currently under construction. The Phase 3 Project was analyzed in previous environmental documents (see Section 1.5.4.3, below) and preliminary construction began in fall 2009, with major levee construction planned to begin in 2010, assuming receipt of all required environmental clearances and permits. The Phase 4a Project was analyzed in previous environmental documents (see Section 1.5.4.4, below) and preliminary construction is planned to begin in 2011, assuming receipt of all required environmental clearances and permits. See Section 4.18, "Summary of Environmental Impacts and Mitigation Measures from Previous Natomas Levee Improvement Program Landside Improvements Project Phases 1–4a," for a summary of impacts and mitigation measures associated with the Phase 1–4a Projects.

The Phase 4b Project, builds upon a program of improvements analyzed in previous environmental documents, listed in Section 1.5 below, for achieving flood risk damage reduction for the 53,000-acre Natomas Basin, which is encircled by 42 miles of levees (**Plate 1-1**). The Phase 4b Project is the final subphase of the Landside Improvements Project and is the subject of this EIS/EIR, consists of improvements to the remaining portion of the Natomas Basin's perimeter levee system in the City of Sacramento and in Sacramento and Sutter Counties, California. The improvements consist of levee improvements, associated landscape and irrigation/drainage infrastructure modifications, and habitat creation and management.

The Common Features/Natomas PACR is being prepared by USACE to consider the level of Federal participation in flood risk management for the Natomas Basin. The schedule for completing the Common Features/Natomas PACR has been accelerated due to the high risk of levee failure in the Natomas Basin. The accelerated schedule will allow USACE to begin construction as early as 2012 (assuming Congressional authorization and receipt of all environmental clearances and permits) and reduce the risk of flooding and billions of dollars of property damage in the Natomas Basin.

USACE plans to implement the Phase 4b Project; however, in the event the Common Features/Natomas PACR is not approved by Congress, this EIS/EIR will support SAFCA's implementation of the Phase 4b Project, should SAFCA choose to proceed without additional Federal participation.

For SAFCA to implement the Phase 4b Project, SAFCA is requesting permission from USACE pursuant to Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] Section 408, hereinafter referred to as "Section 408") for alteration of Federal project levees; Section 404 of the Clean Water Act (33 USC Section 1344, hereinafter referred to as "Section 404") for the placement of fill in jurisdictional waters of the United States; and Section 10 of the Rivers and Harbors Act of 1899 (33 USC Section 403, hereinafter referred to as "Section 10") for work in, over, or under navigable waters of the United States (such as excavation of material from or deposition of material into navigable waters). This EIS/EIR covers the requested permissions from USACE, if needed.

NEPA evaluation is required when a major Federal action, including a permit, authorization, or approval, is under consideration and may have significant impacts on the quality of the natural and human environment. The Phase 4b Project has the potential to significantly affect the natural and human environment; therefore, USACE has prepared this EIS. Compliance with CEQA is required when a state or local public agency proposes to carry out or approve a project that may have a significant adverse effect on the physical environment (i.e., significant impact). As the lead agency for CEQA compliance, SAFCA has determined that the proposed project may have significant impacts on the physical environment and, therefore, has prepared this EIR.

The project proponent(s) may also need to obtain several state approvals or permits, to implement the Phase 4b Project: California Central Valley Flood Protection Board (CVFPB) encroachment permit, California Surface Mining and Reclamation Act permit, Clean Water Act Section 401 water quality certification, Clean Water Act Section 402 National Pollutant Discharge Elimination System permit, California Fish and Game Code Section 2081 incidental take authorization, California Fish and Game Code Section 1602 Streambed Alteration Agreement, California Department of Transportation (Caltrans) encroachment permit, and permits from two local air districts, Sacramento Metropolitan Air Quality Management District and Feather River Air Quality Management District.

1.1.1.1 Relationship Between the Federal Interest and the Natomas Levee Improvement Program (408 Permission)

Federal Interest

This section will describe the process used by USACE to determine what the Federal interest in the project is.

In the civil works project planning context, National Economic Development (NED) can be generally defined as economic benefit-cost analysis for plan formulation, evaluation, and selection that is used to evaluate the Federal interest in pursuing a prospective project plan. The P&G analytical framework for the use of NED analysis relates specifically to civil works.

Civil works project planning is as follows:

The Federal Objective:

(a) The Federal objective of water and related land resource project planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

(b) Contributions to NED are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed.

(c) The Federal Objective for the relevant planning setting should be stated in terms of an expressed desire to alleviate problems and realize opportunities related to the output of goods and services or to increased economic efficiency. (P&G, Chapter I, Section II)

Plan Selection:

(a) The alternative plan with the greatest net economic benefit consistent with protecting the Nation's environment (the NED plan) is to be selected unless the Secretary of a department or head of an independent agency grants an exception when there is some overriding reasons for selecting another plan, based on other Federal, State, local and international concerns. (P&G, Chapter I, Section X)

Together, the Federal objective and plan selection criterion for civil works projects indicate that, at the individual project level, planners should formulate, evaluate, and select plans to recommend for Federal involvement that provide the greatest net economic benefits to the nation as a whole, subject to an environmental protection constraint. This direction is based on the presumption that Federal civil works investments should be considered only for project plans that maximize net economic benefits—measured in terms of a single index of monetary value realized by the nation as a whole. That is, the Federal objective and plan selection rule impose a "national economic efficiency" standard for Federal participation in a civil works project without regards to the distributional consequences for affected individuals (i.e., who gains and who loses). Planners are directed to formulate plans for relevant project purposes (e.g., inland navigation) that contribute to the NED objective, and to recommend for Federal implementation the plan that maximizes the difference between money measures of aggregate benefits and costs, as calculated by summing measured economic gains and losses (including the financial costs required to implement projects) realized by affected individuals. Projects may deviate from the

NED Plan if requested by the non-Federal sponsor and approved by the Assistant Secretary of the Army (ASA) Civil Works.

Natomas Levee Improvement Program (408 Permission)

This section describes what the Natomas Levee Improvement Program (NLIP) is and how it is related to the NED Plan.

The NLIP is an early implementation project being constructed by SAFCA to provide flood risk reduction to the Natomas Basin as quickly as possible. The NLIP consist of four phases and started in 2007 with construction along the Natomas Cross Canal (NCC). To implement the proposed improvements, SAFCA requested Section 408 permission from USACE for alteration of Federal project levees. The alternatives in this EIS/EIR include a levee raise which would be constructed under the Section 408 authority. Because SAFCA may request Section 408 permission for the raise, it is included in this EIS/EIR, but it will not be constructed as part of the interim NED plan.

Hydraulics

The Natomas Basin is part of the Sacramento River Flood Control Project (SRFCP), an integrated system of levee-protected basins. The design of the SRFCP anticipates that agricultural basins will be protected by levees that are at least high enough to contain flood waters comparable to those produced by the floods of 1907 and 1909, and later modified to include floods that occurred in the 1920s and 1930s. The flood water elevations designated for each basin in the system were specified in a Memorandum of Understanding (MOU) between USACE and the State of California. The MOU was originally developed in 1953 and later amended. The design specified in the MOU calls for agricultural levees to be at least equal in height to the designated water surface elevation ("1957 profile") plus three to six feet of freeboard to address hydrologic and engineering uncertainty and contain wind-driven waves.

SAFCA has performed a risk analysis, considering uncertainty in hydraulic and hydrologic inputs, evaluating the potential for these levee raises to cause adverse hydraulic impacts (or transfer of risk) to other basins in the SRFCP. This evaluation assumed the authorized profile of all agricultural project levees, while the levees protecting urban areas were assumed to be raised to the levels mandated by State law. SAFCA carried out this analysis using a UNET hydraulic model originally developed by USACE and modified by MBK Engineers that fully incorporates the hydrologic and hydraulic data developed in connection with the Sacramento and San Joaquin Rivers' Comprehensive Study. The risk analysis used USACE's HEC-FDA software and relied on standard probability distributions to account for uncertainty in discharge and stage. The risk analysis addressed uncertainty in levee performance outside of the Natomas Basin by assuming that levees would function as weirs when water surface elevations exceed the top of levee. It is highly likely that many levees in the SRFCP will fail when water rises above the design flood elevation but prior to water reaching the top of the levee. The deterministic assumption that levees will not fail even when water exceeds the top of the levee provides a very conservative approach to estimating the project's potential impacts and probably overstates any potential risk.

For purposes of the analysis, the key indicator of risk transfer was whether levee raises around the Natomas Basin significantly increased the annual probability of levee overtopping (annual exceedance probability [AEP]) at any of the several index points established for the purpose of the analysis along levees outside the Natomas Basin. To reflect the effects of upstream levee overtopping on downstream water surface elevations, the affected levees were converted to weirs and standard assumptions were made regarding levee/weir lengths and resulting discharge patterns. The model compared water surface elevations upstream and downstream of the Natomas Basin with and without the proposed levee raises in place under a range of flow conditions (0.01 AEP [100-year], 0.005 AEP [200-year], and 0.002 AEP [500-year]). Considering the uncertainty in flows and stages, AEP values were computed for top of levee elevations at the index locations and compared system wide for with and without project conditions.

The risk analysis indicated that raising the levees around the Natomas Basin would have no significant effect on AEPs outside the Natomas Basin. On this basis, SAFCA concluded that raising the Natomas levees to meet State urban levee requirements would not result in any adverse hydraulic impacts on other basins protected by the SRFCP. This analysis was included in the review documentation supporting the Section 408 approval by USACE.

The hydraulic modeling developed for the Comprehensive Study was based upon National Geodetic Vertical Datum of 1929 (NGVD29) rather than the North American Vertical Datum of 1988 (NAVD88) datum. As indicated in the discussion of risk and uncertainty, this results in additional uncertainty in the stage/frequency relationship. USACE, Sacramento District is presently in the process of updating and refining the hydraulic models, which will be used to confirm/refine the system analysis of hydraulic impacts as part of the Common Features GRR.

In this EIS/EIR, because there is uncertainty about the vertical datum used in the hydraulic model, there is associated uncertainty in the n-year frequency estimates of water surface elevations. Therefore, while it appears as if raises are in the Federal interest, the amount of levee raise cannot be optimized. For the follow-on Common Features GRR, the model will be converted to the NAVD88 vertical datum, and the amount of levee raise will be optimized. At that point, a definitive analysis of hydraulic impacts due to these levee raises will be made, and any needed mitigation determined.

Levee fixes as part of this EIS/EIR for below and up to the top of levee do not cause any hydraulic impacts because there is no change to the water surface profiles between with and without project conditions. Further discussion on this topic is contained in **Appendix C1**.

Alternatives

This EIS/EIR describes three alternatives: No-Action, Fix-in-Place, and Adjacent Levee Alternatives. The Proposed Action is the Adjacent Levee Alternative. USACE, however, has not determined if the levee raise, and improvements to the Natomas East Main Drainage Canal (NEMDC) North (Reaches F–G) and the American River north levee (Reach I:1–4), will be in the Federal interest (NED Plan). USACE will recommend to Congress the NED plan, which is the Adjacent Levee Alternative without the levee raise or improvements to the NEMDC North (Reaches F–G) and the American River north levee (Reach I:1–4). The Locals will then agree to pay the difference between the NED Plan and the Proposed Action, which is ultimately what could be constructed.

Under NEPA, an EIS must consider all feasible alternatives and consider the worst-case scenario to disclose to the public all potential impacts. This EIS/EIR considers the impacts associated with the levee raise, and improvements to NEMDC North (Reaches F–G) and the American River north levee (Reach I:1–4) because they will be constructed as part of the project and funded by the non-Federal sponsor. USACE has evaluated the Proposed Action and determined that the implementation of that alternative has a greater net benefit than the smaller scale plans.

1.1.2 Lead Agencies, Cooperating Agency, and Non-Federal Sponsor

USACE is the Federal lead agency for NEPA, and SAFCA is the California lead agency for CEQA.

The Federal Aviation Administration (FAA) is serving as a cooperating agency for NEPA. In the event that SAFCA and USACE select an alternative that requires the Sacramento International Airport (Airport) to change its Airport Layout Plan or seek a release from Federal Airport Improvement Grant assurances, the FAA would use this EIS/EIR in exercising its decision-making authority under 49 USC Section 47107 regarding whether to approve those actions. The CVFPB is serving as a non-Federal sponsor of USACE's Common Features GRR and Common Features/Natomas PACR, and is concerned about integrating overall flood damage reduction in Sacramento.

1.1.3 PURPOSE AND INTENDED USES OF THIS DOCUMENT

The purpose of this EIS/EIR is to evaluate the potential signifieant environmental impaets of the Phase 4b Project.

This EIS/EIR will be used to support Congressional approval of USACE's Common Features/Natomas PACR. In the event Congress does not authorize USACE to construct the Phase 4b Project, and SAFCA chooses to proceed with the Phase 4b Project without additional Federal participation, this EIS/EIR will be used to support USACE's decisions regarding whether to grant or deny permission to SAFCA for the Phase 4b Project pursuant to Sections 408, 404, and 10; and SAFCA's decision regarding whether to approve the Phase 4b Project.

SAFCA will consider whether or not to certify the EIR and approve the Phase 4b Project in fall 2010. This decision will be based on numerous factors, including the potential environmental impacts and mitigation measures addressed in this EIS/EIR, permitting requirements, Federal and state authorizations, funding and financing mechanisms, and implementation schedule.

This EIS/EIR will also be used by CEQA responsible agencies, such as the CVFPB and Central Valley Regional Water Quality Control Board, and trustee agencies, such as the California Department of Fish and Game, to ensure that they have met the requirements of CEQA before deciding whether to issue discretionary permits over which they have authority. It may also be used by other state and local agencies, which may have an interest in resources that could be affected by the project.

This EIS/EIR is not intended to be used as the environmental clearance document for future development projects proposed in the Natomas Basin.

1.1.4 DOCUMENTS INCORPORATED BY REFERENCE

Incorporation by reference is encouraged by both NEPA (40 CFR Sections 1500.4, 1502.21) and CEQA (CCR Section 15150). Both NEPA and CEQA require citation to and a brief summary of the referenced material, as well as information about the public availability of the incorporated material. CEQA also requires citation of the state identification number of the EIRs cited. This EIS/EIR is tiered from, or incorporates by reference, information contained in the following documents:

- *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area*, State Clearinghouse No. 2006072098 (Local Funding EIR) (SAFCA 2007a), which evaluates impacts expected to result from the Phase 1 Project at a project level and the NLIP at a program level;

- *Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR) (SAFCA 2007c), which evaluates impacts expected to result from the Phase 2 Project at a project level and the remainder of the NLIP at a program level;

- *Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project* (Phase 2 EIS) (USACE 2008), which evaluates impacts expected to result from the Phase 2 Project at a project level and the remainder of the NLIP at a program level;

- *Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 SEIR) (SAFCA 2009a), which evaluates impacts expected to result from modifications to the Phase 2 Project at a project level;

- *Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR 1st Addendum) (SAFCA 2009c), which evaluates minor changes to the Phase 2 Project;

- *2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR 2nd Addendum) (SAFCA 2009d), which evaluates minor changes to the Phase 2 Project;

- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIS and EIR) (USACE 2009 and SAFCA 2009b), which evaluates impacts expected to result from the Phase 3 Project at a project level;

- *Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIR Addendum) (SAFCA 2009e), which evaluates minor changes to the Phase 3 Project; and

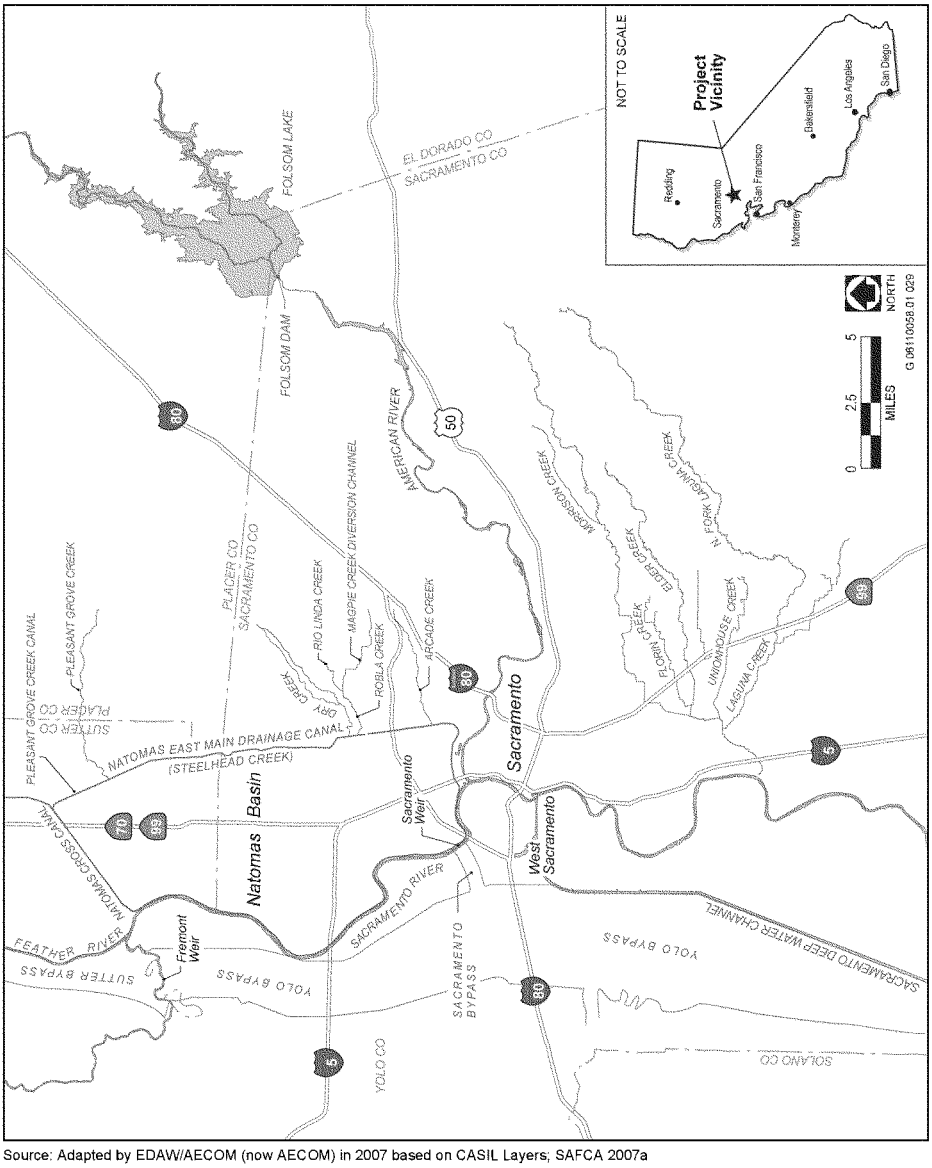
- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project*, State Clearinghouse No. 2009032097 (Phase 4a EIS and EIR) (USACE 2010 and SAFCA 2009f), which evaluates impacts expected to result from the Phase 4a Project at a project level.

Portions of these documents, where specifically noted, are summarized throughout this EIS/EIR. Printed copies of these documents are available to the public at USACE's office at 1325 J Street, Sacramento, California, and on USACE's Web site at http://www.spk.usace.army.mil. These documents are also available at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California, during normal business hours, and on SAFCA's Web site, at http://www.safca.org/Programs_Natomas.html.

1.2 PROJECT LOCATION AND EXISTING PERIMETER LEVEE SYSTEM

The 53,000-acre Natomas Basin in northern Sacramento and southern Sutter Counties, California, including a portion of the city of Sacramento (**Plate 1-1**), is bounded by a levee system. Originally constructed in the early part of the 20th century, this levee system is bordered by the NCC to the north, the Sacramento River to the west, the American River to the south, and the Pleasant Grove Creek Canal (PGCC) and NEMDC/Steelhead Creek to the east.

This levee system was initially designed to improve navigation and reduce the risk of flooding for the purposes of facilitating agricultural development of the extensive floodplains encompassed by the Sacramento Valley. Levees set closely along the rivers were designed to contain flows generated by common floods, and bypasses were constructed to carry overflows generated by large floods. The close-set levees along the rivers ensured that velocities in the river would help scour the river bottom and move sediment through the system, reducing dredging costs for sustaining navigation. Together, the river channels and bypasses were designed to transport a flood of the magnitude of the 1907 and 1909 Sacramento River floods (see **Table 1-1** for the 1907 and 1909 flood flows relative to other historical flood flows).



Source: Adapted by EDAW/AECOM (now AECOM) in 2007 based on CASIL Layers; SAFCA 2007a

Project Location **Plate 1-1**

Table 1-1
Ranking of Maximum 3-day Unimpaired Flows at Specified Locations

Rank	Sacramento River at Shasta Dam [a]	Sacramento River at Bend Bridge [b]	Feather River at Oroville [c]	Yuba River near Marysville [d]	American River at Fair Oaks [e]
1	1997–168 kcfs	1997–241 kcfs	1997–244 kcfs	1997–124 kcfs	1986–166 kcfs
2	1970–132 kcfs	1974–212 kcfs	1986–187 kcfs	1986–123 kcfs	1997–164 kcfs
3	1974–130 kcfs	1970–206 kcfs	1965–165 kcfs	1965–118 kcfs	1965–140 kcfs
4	1940–125 kcfs	1940–196 kcfs	**1907–150 kcfs**	1956–107 kcfs	1956–127 kcfs
5	1956–120 kcfs	1965–187 kcfs	1956–147 kcfs	**1907–103 kcfs**	1951–108 kcfs
6	1965–117 kcfs	1956–176 kcfs	**1909–129 kcfs**	**1909–87 kcfs**	1928–98 kcfs
7	1986–115 kcfs	1986–175 kcfs			1980–98 kcfs
8	**1907–~95 kcfs**	1983–174 kcfs			1963–94 kcfs
9	**1909–~95 kcfs**	**1909–162 kcfs**			**1907–88 kcfs**
10		**1907–158 kcfs**			**1909–87 kcfs**

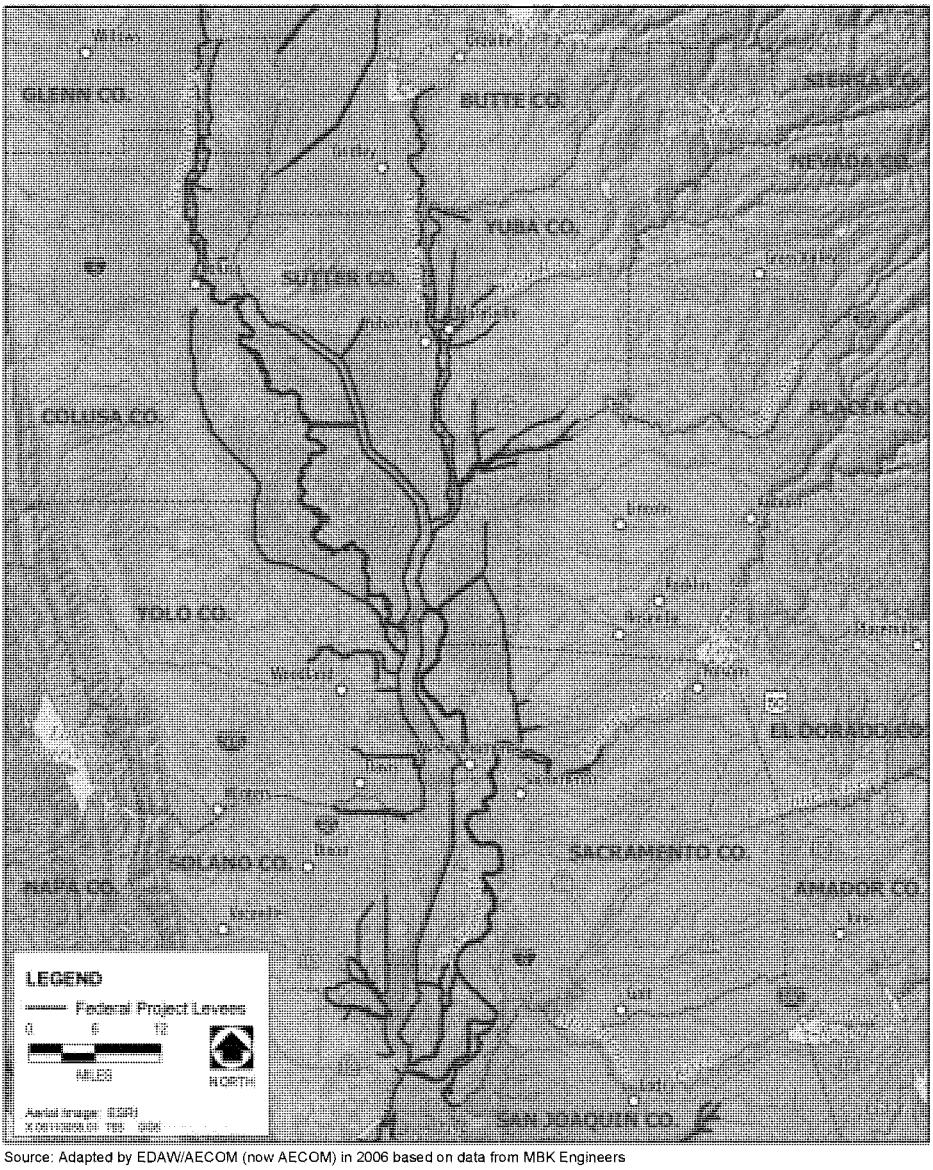
Notes: kcfs = 1,000 cubic feet per second; bold denotes the flows during the 1907 and 1909 floods
Periods of Record = [a] 1932–1998, [b] 1893–1998, [c] 1902–1997, [d] 1904–1997, and [e] 1905–1997
Source: California Reclamation Board (now CVFPB) and USACE 2002 (for all data except Sacramento River at Shasta Dam 1907 and 1909) and Roos 1997: 2 (Sacramento River at Shasta Dam 1907 and 1909 values were estimated from this source)

1.2.1 PERIMETER LEVEE SYSTEM

The perimeter levee system around the Natomas Basin is part of an integrated system of levees, overflow bypass channels, and dams that comprises the SRFCP (**Plate 1-2**). Over time, the original capacity of the SRFCP was greatly expanded by the construction of five major multipurpose dam-reservoir complexes (Shasta, Black Butte, Oroville, New Bullards Bar, and Folsom Reservoirs) containing 2.7 million acre-feet of dedicated flood storage space. These dams were justified in part by public safety considerations, specifically the need to provide a high level of flood risk reduction to the historical urban settlements at the confluence of the Feather and Yuba Rivers (Yuba City and Marysville) and the American and Sacramento Rivers (Sacramento and West Sacramento). Following are descriptions of flood damage reduction facilities provided by the levee system and the channels that border the Natomas Basin.

USACE has divided the flood damage reduction improvements within the Natomas Basin into nine reaches (Reaches A–I), as shown on **Plate 1-3**. USACE's reach designations differ from SAFCA's reach designations, which are more finely subdivided than the USACE system for the Sacramento River east levee, American River north levee, and the NCC. In **Plate 1-3**, and as listed below, lettered reaches follow the USACE designation, while numbered reaches follow the SAFCA designations:

- Sacramento River east levee: Reach A:16–20
- Sacramento River east levee: Reach B:5A–15
- Sacramento River east levee: Reach C:1–4B
- NCC: Reach D:1–7
- PGCC: Reach E: there are no SAFCA reaches, just station numbers
- NEMDC North: Reaches F–G
- NEMDC South: Reach H
- American River north levee: Reach I:1–4



Source: Adapted by EDAW/AECOM (now AECOM) in 2006 based on data from MBK Engineers

Sacramento River Flood Control Project **Plate 1-2**

Levee Segments Requiring Seepage Remediation and Levee Height Increases

Plate 1-3

1.2.1.1 NATOMAS CROSS CANAL

The NCC, Reach D:1-7, carries water from several tributary watersheds in western Placer County and southern Sutter County to the Sacramento River. The 5.3-mile-long channel at the north boundary of the project begins at the PGCC and East Side Canal, and extends southwest to its confluence with the Sacramento River near the Sankey Road/Garden Highway intersection. Raised water elevations that can affect the NCC levees come during periods of flooding. The Sutter Bypass, Sacramento River, Feather River, and NCC all contribute to flooding of the NCC. For planning purposes, the NCC south levee has been divided by SAFCA into seven reaches, as shown in **Plate 1-3**. USACE designates the NCC as Reach D. In the pre-NLIP project condition, much of the south levee contained a stability berm with an internal drainage system that was constructed as part of the North Area Local Project (NALP). Levee slopes were approximately 3:1 horizontal to vertical (3H:1V) on the waterside and 2H:1V on the landside, with an approximately 80- to 100-foot maintenance access area on the landside of the levee through most of the NCC's length. The Phase 2 Project widened the levee footprint by raising the levee, flattening the landside levee slope, and constructing a cutoff wall. Most of the land along the south levee consists of privately owned farmland and habitat owned and managed by The Natomas Basin Conservancy (TNBC).

1.2.1.2 SACRAMENTO RIVER EAST LEVEE

The east levee of the Sacramento River, referenced in this document as the "Sacramento River east levee," protects the 18-mile west side of the Natomas Basin between the NCC and the American River. For planning purposes, SAFCA has divided the levee into 20 reaches, as shown in **Plate 1-3**. USACE divides the levee into 3 reaches: A, B, and C. Garden Highway is located on top of the levee crown through all 20 (3) reaches. A 10-foot-wide drained stability berm is present on the landside slope of the levee between the NCC and Powerline Road (Reaches C:1–4B and B:5A–11), and cutoff walls are present in the levee in Reaches B:12–15 and A:16–20.

These improvements were components of the Sacramento Urban Levee Reconstruction Project and the Common Features Project.

Along the landside, Reaches C:1–4B and B:5A–13 are bordered mainly by private agricultural lands containing a few rural residences, the Airport, and two farmed parcels owned and managed by TNBC. The Airport lands bordering Reaches C:1–4A and B:5A–13 are referred to as the "Airport north bufferlands." Teal Bend Golf Club is west of the Airport, adjacent to the levee along Reach B:6. The parcels bordering Reaches B:14–15 and A:16–18 contain more residences, several rural estates, and three TNBC parcels. The landside of Reaches A:19 and A:20 is bordered by residential subdivisions, a business park, and the City of Sacramento's Natomas Oaks Park, undeveloped Costa Park site, and Shorebird Park.

Several marinas and restaurants are located along the waterside of the levee in Reaches C:1–4B, B:5A–15, and C:16–20 along with more than 150 residences and numerous private boat docks. Many fences, gates, and other appurtenances associated with these properties are located on the levee itself.

1.2.1.3 PLEASANT GROVE CREEK CANAL WEST LEVEE

The PGCC west levee, Reach E, extends southerly for approximately 3.3 miles from the east end of the NCC south levee at Howsley Road to the north end of the NEMDC/Steelhead Creek levee near the Sankey Road crossing (**Plate 1-3**). The PGCC west levee protects the Natomas Basin from flood flows from Pleasant Grove Creek, tributary creeks in western Placer County and southern Sutter County, and water backed up in the NCC from high river stages in the Sacramento River.

Levee slopes are generally 2H:1V on both the waterside and landside of the levee. Natomas Road is located on top of the levee crown. No berms support this levee. However, as part of implementing the NALP, SAFCA constructed concrete-capped sheetpile walls at Howsley, Fifield, and Sankey Roads to provide hardened sections

at these roadway crossings where levee height was inadequate. The Fifield Road/Natomas Road intersection was subsequently raised by Sutter County when it replaced the Fifield Road bridge over the PGCC. Several drainage culverts cross under the PGCC to drain areas to the east into the Reclamation District (RD) 1000 drainage system. A private irrigation canal extends parallel to the PGCC west levee for about 1,500 feet at the landside levee toe. The land uses along the PGCC are primarily agricultural uses along with minimal industrial manufacturing and rural residential uses.

1.2.1.4 NATOMAS EAST MAIN DRAINAGE CANAL WEST LEVEE

The NEMDC (also known as Steelhead Creek) extends for approximately 13.3 miles from high ground near Sankey Road to the American River north levee and, with the PGCC west levee, forms the easterly boundary of the Natomas Basin (**Plate 1-3**). The west levee of the NEMDC confines the canal through the entire reach. The east side of the canal is unconfined north of SAFCA's NEMDC stormwater pumping station. This facility is connected to the NEMDC west levee and the Dry Creek north levee. It prevents elevated floodwaters in Dry Creek and the southern reach of the NEMDC from entering the northern reach of the NEMDC. The pumping facility also collects local flood runoff from the Natomas East Stream Group and from spills (PGCC floodwaters) over the high ground near Sankey Road, and discharges this stormwater into the southern reach of the NEMDC. The east side of this southern reach intersects Dry/Robla Creek and Arcade Creek and is confined by the NEMDC east levee, which extends for about 4 miles from the Dry/Robla Creek south levee to the Arcade Creek north levee and from the Arcade Creek south levee to the American River north levee at the mouth of the NEMDC. East Levee Road extends along the crown between Sankey Road and Main Avenue.

As part of the NALP, SAFCA raised the west levee of the NEMDC from 2.0 to 4.5 feet between the NEMDC stormwater pumping station and the American River north levee, and raised the east levee of the NEMDC from 1.0 to 3.5 feet between the Dry/Robla south levee and the American River north levee. These improvements were designed to provide a high level of flood risk reduction to the Natomas Basin by providing at least 3 feet of levee height above the 200-year (0.005 AEP) flood in Dry Creek and Arcade Creek combined with the maximum water surface likely to be produced at the mouth of the NEMDC by a 200-year (0.005 AEP) or greater flood along the American River side slopes.

1.2.1.5 AMERICAN RIVER NORTH LEVEE

The Natomas section of the American River north levee, Reach I, extends for about 2.2 miles from its junction with the Sacramento River east levee at the mouth of the American River to its junction with the NEMDC west levee, as shown in **Plate 1-3**. This levee was constructed as part of the Natomas perimeter levee system and is designed to prevent floodwaters in the American River from entering the Natomas Basin. Built before the construction of Folsom Dam, this levee is set back over 1,000 feet north of the American River main channel and is high enough to provide 3 feet of levee height above the maximum water surface elevation likely to be produced at the mouth of the NEMDC by a 200-year (0.005 AEP) or greater flood along the American River. For NLIP planning purposes, SAFCA has divided the levee into four reaches, as shown in **Plate 1-3**. USACE designates one reach, Reach I for the American River north levee. The general configuration of the levee in these reaches is 3H:1V waterside slopes and 2H:1V landside slopes. Levee crown widths range from 30 to 60 feet. Garden Highway runs along the levee crown for most of these reaches and ranges from two to four lanes.

1.2.2 FLOODFLOW CONDITIONS

The Natomas Basin is subject to flooding from a combination of flows in the Sacramento and American River channels and in the tributary streams east of the Basin. Along the northern and western perimeters of the Basin, the greatest threat is from a large flood in the Sacramento–Feather River basin combined with high runoff in the creeks and streams of southern Sutter and western Placer Counties that drain through the NCC. This threat is somewhat mediated by the operation of the Fremont Weir and Yolo Bypass system, which absorbs approximately 80% of the flood flow reaching the northern end of the Natomas Basin from the Feather and Sacramento River

basins. Along the southern and southeastern perimeters of the Basin, the greatest threat is from a large flood in the American River basin combined with high runoff in the tributary creeks and streams of western Placer and northern Sacramento Counties that drain through the NEMDC/Steelhead Creek.

1.3 NATOMAS LEVEE IMPROVEMENT PROGRAM HISTORY AND PLANNING CONTEXT

SAFCA has developed the NLIP to address identified deficiencies in the levee system protecting the Natomas Basin in Sacramento and Sutter Counties, California. The objectives of the NLIP are to: (1) provide at least a 100-year level of flood risk reduction (0.01 AEP) to the Natomas Basin as quickly as possible; (2) provide 200-year flood risk reduction (0.005 AEP) to the Basin over time; and (3) avoid any substantial increase in annual flood damages as new development occurs in the Basin.

The Natomas Basin perimeter levee system was originally constructed to promote agricultural development. The historic Sacramento River floods of 1907 and 1909 (see **Table 1-1** for flood flows) triggered the comprehensive, Federally financed and managed, flood risk reduction effort that has unfolded over the past 85 years under the leadership of USACE, and the California Department of Water Resources (DWR) and CVFPB (hereinafter referred to together as "State"). The product of this effort is the SRFCP, an integrated system of levees, overflow bypass channels, and dams that was designed and constructed by Federal, State, and local interests over several decades to protect farmlands and urban areas in the Sacramento Valley from large floods. The SRFCP has protected the Natomas Basin from significant flooding since construction of the perimeter levee system in 1914.

Today, the Natomas Basin is the location of the Airport and the site of extensive urban development, primarily occupying the southern third of the Basin. The Basin's remaining agricultural lands provide habitat for a number of important wildlife species. This habitat is protected under Federal and state law, and expansion of the urban footprint into much of the remaining agricultural areas is governed by the *Natomas Basin Habitat Conservation Plan* (NBHCP), which is aimed at setting aside and conserving tracts of agricultural land that are needed to sustain habitat for the affected species. The Natomas Basin's historic floodplain is occupied by more than 83,000 residents and contains $8.5 billion in damageable property. **Table 1-2** presents a brief timeline of major flood-related events in the Natomas Basin.

As stated above, the overall purpose of the multi-phase NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and State standards for levees protecting urban areas. The Phase 4b Project is the final project phase of the NLIP Landside Improvements Project.

The NLIP's proposed improvements address identified deficiencies in the Natomas Basin perimeter levee system based on (1) design criteria used to certify levees as providing 100-year flood risk reduction (0.01 AEP) under regulations adopted by the Federal Emergency Management Agency (FEMA), (2) design criteria used by USACE and the State for the levees comprising the Common Features Project, and (3) design 200-year[1] (0.005 AEP) water surface elevations developed by SAFCA in cooperation with the State using hydrologic modeling data developed by USACE and the State as part of the Sacramento–San Joaquin River Basins Comprehensive Study.

Although SAFCA anticipates that all segments of the Natomas perimeter levee system will eventually be improved to meet all of the above design criteria, SAFCA is partnering with DWR using SAFCA's local assessments and grant funding available through DWR's FloodSAFE California Program to initiate improvements

[1] Design event analysis results, as a measure of system performance, are given as the expected (mean) frequency of the maximum event that can be safely passed through the reservoir, spillway, and downstream leveed system with a set (e.g., 3 feet) "freeboard" above the computed (expected) water surface profile. Design event analysis is not the same as the analysis procedure used by USACE as a basis for determining Federal interest in a project or for USACE certification for FEMA's National Flood Insurance Program. USACE defines system performance as containing a specified frequency event (e.g., 0.01 event) with a high level of assurance (i.e., Conditional Non-exceedance Probability = 0.9) and includes consideration of system uncertainties.

Table 1-2
History of the Natomas Basin Flood Damage Reduction System

Year/Timeframe	Flood Damage Reduction Project/Event
1911–1915	Natomas Basin reclaimed: levees and interior drainage constructed
1917–1967	Levees authorized as part of the SRFCP; construction on the SRFCP is initiated and completed in stages
1968	National Flood Insurance Program authorized
1978	First NFIP 100-year Flood Maps issued by FEMA
1986	Major floods lead to SRFCP system re-evaluation
1989	FEMA issues new 100-year Flood Maps encompassing most of the city of Sacramento
1990–1993	Congress provides funding for the Sacramento Urban Levee Reconstruction Project
1993–1998	SAFCA carries out the NALP
1996	Congress authorizes raise and strengthening of Sacramento River east levee and strengthening of American River north levee
1997	Major flood in SRFCP
1998	USACE certifies Natomas Basin levees for 100-year FEMA flood protection
1999	Congress authorizes raise and strengthening of the NCC south levee
1999	Post-1997 Flood Assessment recognizes underseepage as a threat
2000	USACE initiates Natomas Basin Common Features Design
2002	USACE conducts public scoping meetings
2003	USACE Levee Task Force completes development of deep underseepage criteria
2004	USACE adopts Standard Operating Procedures for Urban Levee Design
2004–2006	SAFCA evaluates Natomas Basin levees
2004	USACE initiates General Re-Evaluation of the Common Features Project
2006	USACE recommends levee decertification based on new geotechnical information and new standards
2006	SAFCA initiates the NLIP
2006	SAFCA Board of Directors certifies the Local Funding EIR, and USACE adopts a Finding of No Significant Impact and grants permission pursuant to Section 408 for the Phase 1 Project
2007	SAFCA Board of Directors certifies the Phase 2 EIR
2008	USACE issues the Phase 2 EIS
2008	SAFCA completes construction of the Phase 1 Project
2009	USACE issues the Phase 2 ROD, granting permission pursuant to Sections 408 and 404 for the Phase 2 Project
2009	SAFCA Board of Directors certifies the Phase 2 SEIR
2009	USACE and SAFCA issue the Phase 3 DEIS/DEIR; SAFCA issues the Phase 3 FEIR and certifies the Phase 3 EIR
2009	SAFCA begins construction of the Phase 2 Project
2009	USACE issues the Phase 3 FEIS
2009	USACE and SAFCA issue the Phase 4a DEIS/DEIR; SAFCA issues the Phase 4a FEIR and certifies the Phase 4a EIR
2009	USACE issues the Phase 3a ROD (note: after the Phase 3 FEIS was prepared, Phase 3 was separated into Subphases 3a and 3b to complete RODs associated with different permitting authorities); SAFCA begins preliminary construction on the Phase 3a Project
2010	USACE issues the Phase 4a FEIS; USACE issues the Phase 3 ROD (covering 3b), granting permission pursuant to Section 408 for the Phase 3 Project

Notes: EIR = environmental impact report; EIS = environmental impact statement; FEMA = Federal Emergency Management Agency; NFIP = National Flood Insurance Program; NLIP = Natomas Levee Improvement Program; NALP = North Area Local Project; NCC = Natomas Cross Canal; SAFCA = Sacramento Area Flood Control Agency; SRFCP = Sacramento River Flood Control Project; USACE = U.S. Army Corps of Engineers; ROD = record of decision; SEIR = Supplemental EIR
Source: Data compiled by AECOM in 2009

to segments of the Natomas perimeter levee system in advance of full Federal authorization for the constructed improvements. SAFCA anticipates completion of this "early implementation project"—which includes the Phase 2, 3, and 4a Projects—by 2012. Phase 2 Project construction is underway and is anticipated to be completed by 2010; it is anticipated that construction of the Phase 3 and 4a Projects will be completed by 2012. USACE plans to complete improvements to the remaining segments of the perimeter levee system (i.e., the Phase 4b Project). This will require Congressional authorization to expand the scope of the already authorized Common Features Project based on the information and recommendations provided in the Common Features/Natomas PACR. SAFCA is coordinating with USACE to ensure that the planning and design of the early implementation project are consistent with applicable USACE planning, engineering, and design guidelines. This EIS/EIR is the environmental compliance document for and will support the Common Features/Natomas PACR. USACE will subsequently prepare the Common Features GRR, which will cover all elements of the American River Common Features Project, and will be a separate report with its own environmental documentation. USACE and SAFCA recognize that Federal actions taken in connection with the early implementation project will need to be appropriately reflected in both Federal reports.

To move forward as quickly as possible to reduce the risk of flooding in the Natomas Basin, SAFCA identified the broad outlines of the early implementation project at a program level of detail and developed an incremental implementation strategy based on carrying out the project in four phases, with each phase contributing independently and cumulatively to reducing flood risk. Each individual project phase would contribute to reduced flood risk for the Natomas Basin, and thus has independent utility. However, no single project phase would achieve the overall flood risk reduction objectives of the NLIP. The NLIP, as a program, has independent utility from the other areas under consideration in the Common Features GRR because the NLIP will provide added flood risk reduction to an entire area (similar to a ring levee), and this increased flood risk reduction is not dependent on the outcome of the Common Features GRR. The four phases of the NLIP are described in Section 1.5.4, "Natomas Levee Improvement Program Environmental Documentation and Relationship of This EIS/EIR to Other Documents," below.

The NLIP Landside Improvements Project and the NLIP as a whole are part of a larger program of improvements to the flood damage reduction system protecting the Sacramento Area that was initiated as part of the American River Watershed Investigation (ARWI) following the record flood of 1986. This section outlines the key events and actions that have shaped the ARWI so as to provide the historical and legislative context within which the NLIP Landside Improvements Project is being pursued.

1.3.1 1986 Flood

The record flood of 1986 caused levee failures in many areas of the Sacramento Valley that resulted in millions of dollars of property damage and exposed numerous deficiencies in the SRFCP. In the Sacramento area, these deficiencies included: (1) unstable levees along the east bank of the Sacramento River that were susceptible to failure due to the porous nature of the material used in their construction, (2) inadequate conveyance capacity in the drainage channels around the Natomas Basin that serve to divert runoff from the foothills into the Sacramento and American Rivers, and (3) inadequate reservoir storage capacity for controlling large floods in the American River watershed.

1.3.2 Sacramento Urban Levee Reconstruction Project

SAFCA was formed in September 1989 to work with USACE and the State to address the deficiencies exposed by the 1986 flood. The initial step in this effort was to quickly implement the Sacramento Urban Levee Reconstruction Project to stabilize the levees along the east bank of the Sacramento River upstream and downstream of the American River. These levees were constructed in the early part of the 20th century using materials dredged from the river channel that contained significant amounts of sand and silt dislodged from the foothills and mountains along the east side of the Sacramento Valley during the hydraulic mining era. These materials proved to be excessively porous when subjected to the prolonged high flows produced by the 1986

flood, particularly in the Natomas Basin where levee failure due to seepage through the levee was avoided only through a massive effort to shore up the levee during the height of the flood.

The stabilization effort employed two measures to address this seepage problem. Where space permitted, such as in the upper Natomas Basin, a drained stability berm was constructed along the landside toe of the levee to intercept any water seeping through the levee and discharge it onto adjacent lands where it is collected by the interior drainage system and then pumped back into the river. Where space was limited, as in the Pocket area and the lower Natomas Basin, a slurry cutoff wall was excavated through the levee and into less permeable ground below. This cutoff wall serves to reduce seepage through the permeable levee embankment soils. Construction of these improvements, covering approximately 33 miles of the Sacramento River east levee, was initiated in 1990 and completed in 1993.

1.3.3 American River Watershed Investigation Selected Plan

In addition to levee stabilization, USACE, the State, and SAFCA used the ARWI to develop a broad program of improvements to Sacramento's flood damage reduction system focusing on construction of a flood detention dam along the American River near Auburn combined with raising and strengthening the levees along the tributary streams and drainage canals around the Natomas Basin. The ARWI Selected Plan, which was designed to provide reduced flood risk to the Sacramento area, was presented to Congress in 1992. However, in the face of opposition to the detention dam, Congress authorized only the levee improvements around the Natomas Basin and directed that these improvements should proceed while the USACE re-evaluated options for controlling floods along the remainder of the Lower American River. The legislation left open the possibility that the authorized improvements could be constructed by non-Federal interests in exchange for future credits or reimbursements.

1.3.4 North Area Local Project

Relying on the authorization described above, SAFCA quickly initiated the NALP. This locally funded project was designed to provide a high level of flood risk reduction to the Natomas Basin in a manner that neither depended on nor prejudiced the outcome of the continuing effort to develop a comprehensive plan for protecting the floodplains along the Lower American and Sacramento Rivers outside the Natomas Basin. Toward this end, SAFCA designed the levees along the lower reaches of the NEMDC/Steelhead Creek, Arcade Creek, and Dry/ Robla Creek to contain the maximum water surface elevation that could be anticipated in the Lower American River at the mouth of the NEMDC/Steelhead Creek during a 200-year or greater flood event (0.005 AEP) under any of the alternatives under consideration by the AWRI, including no action. The NALP, which also included levee strengthening measures along the south levee of the NCC and west levee of the PGCC, was completed in 1996.

1.3.5 Folsom Dam Reoperation

In 1995, SAFCA entered into a 5-year agreement with the U.S. Bureau of Reclamation (Reclamation) to initiate a variable space storage operation at Folsom Dam. This would allow for an increase in the available space in three large non-Federal reservoirs located in the American River watershed upstream of Folsom Dam which could be used for flood damage reduction. This effort would result in incidental flood damage reduction benefits without formally incorporating the non-Federal reservoirs into the flood damage reduction system and without creating unacceptable impacts to anadromous fish in the Lower American River and to water supply, hydropower, and recreational uses dependent on Folsom Dam.

1.3.6 American River Common Features Project

In 1996, USACE transmitted a Supplemental Information Report (SIR) to Congress that presented the results of the requested re-evaluation of flood risk reduction options for the American River watershed. The SIR concluded

that regardless of what measures might be implemented to increase the available reservoir storage space, the levees extending upstream from the mouth of the river should be strengthened to resist seepage. Moreover, the SIR indicated that SAFCA's levee improvements on the northern and eastern levees of the Natomas Basin were sufficient to protect the Basin from very large floods along the American River, and with modifications to the upper 12 miles of the east levee of the Sacramento River, including increased levee height and levee stability improvements and levee stability along the American River north levee adjacent to Natomas, a similarly high level of flood risk reduction could be secured along the Sacramento River. These American River and Natomas Basin improvements were considered "common features" of any long-term effort to provide Sacramento with a high level of flood risk reduction, and Congress directed the Secretary of the Army to design and construct them under the auspices of the Common Features Project. The authorization of the Common Features Project also allowed the non-Federal partners to proceed with the improvements and receive credit for the work. Finally, Congress directed the Secretary of the Interior to continue the variable space storage operation at Folsom Dam and to extend Reclamation's operational agreement with SAFCA pending implementation of a comprehensive flood damage reduction program for the American River watershed.

1.3.7 1997 Flood

Shortly after the conclusion of the 1996 Federal legislative session, the Sacramento Valley again experienced a flood of record magnitude. The flood of 1997 produced flows in the Lower Sacramento and American Rivers comparable to those of the flood of 1986. The levees around the Natomas Basin and along the Lower American and Sacramento Rivers, bolstered by the accomplishments of the Sacramento Urban Levee Reconstruction Project and the NALP, and relieved by the additional reservoir storage capacity made available by the Folsom Reoperation Project, passed these flows without the signs of levee stress that occurred in 1986. However, the flood did cause failures of some SRFCP levees along the Feather River and Sutter Bypass upstream of the Natomas Basin. The USACE post-flood assessment concluded that deep underseepage may have contributed to these levee failures. To address this risk, USACE recommended a broader scope for the Common Features Project, including deeper seepage cutoff walls through the levees along the Lower American River. USACE also called for an assessment of the need for similar measures along the east levee of the Sacramento River in the Natomas Basin.

1.3.8 Folsom Dam Modification Project and Expansion of the Common Features Project

In 1999, Congress approved a plan for increasing flood risk reduction along the American River by modifying Folsom Dam's outlet works to be more efficient. Congress also expanded the scope of the Common Features Project, calling for additional reaches of the levees along the lower American River to be raised and strengthened to ensure safe containment of flows in the river up to 160,000 cubic feet per second (cfs) with at least 3 feet of additional levee height [2], and directing USACE to raise and strengthen the south levee of the NCC to provide the same level of flood risk reduction afforded by the previously authorized improvements of the east levee of the Sacramento River. Lastly, Congress directed the Secretary of the Army to cooperate with the Secretary of the Interior in devising a long-term variable space storage operation plan for Folsom Dam that would take advantage of the operational capabilities created by the modification of the dam's outlet works and improved weather forecasting.

1.3.9 Joint Federal Project

In 2005, technical challenges associated with enlarging the existing outlet works at Folsom Dam caused USACE, the State, SAFCA, and Reclamation to embrace a new approach to increasing the dam's low-level discharge capacity. This "Joint Federal Project," which was approved by Congress in 2007, will address both flood damage reduction and dam safety issues through construction of a new auxiliary spillway and control gates. The new

[2] See definition of "levee height" in Section 1.4.2.1, "Flood Problems and Needs."

facilities will significantly increase Folsom Dam's low-level outlet capacity, enabling the dam to meet applicable Federal dam safety standards while permitting dam operators to safely contain the 200-year flood (0.005 AEP) in the American River watershed. The new flood damage reduction operation assumes that the variable storage space plan will be continued and that releases from the dam will be increased to 160,000 cfs when inflows to the dam exceed the magnitude of a 100-year flood (0.01 AEP).

1.3.10 COMMON FEATURES GENERAL RE-EVALUATION

Changes in engineering standards and a better understanding of flood risks in the SRFCP system have caused USACE to initiate a general re-evaluation of the elements included in the Common Features Project. The Common Features GRR is expected to be presented to Congress in 2010 with recommendations of scope and cost modifications necessary to ensure that the project can achieve its authorized flood risk reduction objectives.

Initially, the Common Features GRR was primarily focused on evaluating the needs of the Natomas Basin. However, a significant similar effort is also under way with respect to the elements of the Common Features Project along the Lower American and Sacramento Rivers outside the Natomas Basin, where scope and cost modifications may also be needed to ensure that the flood risk reduction objectives of the "Joint Federal Project" are achieved. USACE has determined that the Sacramento River east levee between the American River and the town of Freeport may lack adequate levee height, and may be susceptible to underseepage and erosion. In addition, the levees along the Lower American River may be susceptible to erosion based on the magnitude and duration of the releases from Folsom Dam that occur in such an event. Accordingly, USACE is studying comprehensive alternatives that would consider all the basins in the greater Sacramento area to ensure that levees protecting the city and county of Sacramento, and the area of Sutter County within the Natomas Basin, provide the same level of protection as the Joint Federal Project Folsom Dam improvements, which are already under construction.

SAFCA successfully obtained a grant from DWR for funding an early implementation project as part of FloodSAFE California. FloodSAFE California is a strategic initiative to maximize Proposition 1E and 84 bond funds to reduce flood risk to Californians, develop a sustainable flood management system for the future, and lessen the consequences of floods when they do occur. As detailed in the Local Funding EIR, SAFCA's cost share requirement was met and the funding awarded. SAFCA's early implementation project (Phases 1–4a of the NLIP Landside Improvements Project) is running ahead of the overall Common Features GRR submittal date with the expectation that the perimeter levee improvements that are constructed in advance of any Congressional action on the Common Features GRR will be found consistent with the recommendations contained therein. On that basis, SAFCA anticipates that the non-Federal costs incurred in the early implementation project could be credited against the remaining non-Federal share of the cost of the enlarged Common Features Project or Joint Federal Project.

1.4 PROJECT PURPOSE/PROJECT OBJECTIVES AND NEED FOR ACTION

1.4.1 PROJECT PURPOSE/PROJECT OBJECTIVES

USACE and SAFCA each view the project purpose from the purview of their respective responsibilities, as defined below.

1.4.1.1 U.S. ARMY CORPS OF ENGINEERS

The overall purpose of the project is to develop and select an alternative that would reduce the risk of flood damage in the Natomas Basin. Some residual risk will always remain, however, in any flood damage reduction system. Ultimately, Congress must authorize the Common Features/Natomas PACR, which includes the Phase 4b

Project. If not authorized by Congress, USACE must make decisions on whether or not to grant permission to SAFCA to alter the Natomas Basin levee system (Federal project levees) under Section 408, and issue permits under Sections 404 and 10, for SAFCA to implement the Phase 4b Project without Federal participation.

1.4.1.2 SACRAMENTO AREA FLOOD CONTROL AGENCY

SAFCA's project objectives adopted in connection with the NLIP are: (1) provide at least a 100-year level of flood risk reduction (0.01 AEP) to the Natomas Basin as quickly as possible, (2) provide 200-year flood risk reduction (0.005 AEP) to the Basin over time, and (3) avoid any substantial increase in expected annual damages as new development occurs in the Basin. The first two project objectives would reduce the residual risk of flooding sufficiently to meet the minimum requirements of Federal and state law for urban areas like the Natomas Basin. The third project objective is a long-term objective of SAFCA's.

Additional project objectives that have informed SAFCA's project design are to:

(1) use flood damage reduction projects in the vicinity of the Airport to facilitate management of Airport lands in accordance with the Airport's *Wildlife Hazard Management Plan* (WHMP); and

(2) use flood damage reduction projects to increase the extent and connectivity of the lands in the Natomas Basin being managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species.

SAFCA's approach to defining flood risk reduction accomplishments (system performance) differs from that of USACE; however, the method for determining hydraulic impacts is the same. The hydraulic impact analysis contained in this EIS/EIR evaluates hydraulics impacts based on upstream levees failing when overtopped along with the condition of allowing upstream levees to overtop without failing (see Section 4.5, "Hydrology and Hydraulics"). References in this EIS/EIR to levels of flood risk reduction are based on SAFCA's "best estimate" approach (FEMA's and the State's current method), and should not be taken as USACE concurrence that such levels would be achieved based on USACE's approach of incorporating risk and uncertainty in the estimate of system performance. In any case, flood risk to the Natomas Basin would be considerably reduced by the project. FEMA and NLIP design criteria for the 0.01 and 0.005 AEP events are provided in Table B1-1 in **Appendix B1**.

1.4.2 NEED FOR ACTION

The need for the action is to reduce the flood risk to the Natomas Basin.

The Natomas Basin floodplain is occupied by over 83,000 residents and $8.2 billion in damageable property. Although improvements to the Natomas Basin perimeter levee system, completed as part of the Sacramento Urban Levee Reconstruction Project and the NALP, have significantly reduced flood risk for the area, the Natomas Basin remains vulnerable to flooding in a less than 100-year (0.01 AEP) flood event. Uncontrolled flooding in the Natomas Basin floodplain in a flood exceeding a 100-year (0.01 AEP) event could result in $7.4 billion in damage (this excludes the Airport facilities) (SAFCA 2007b). Flooding could also release toxic and hazardous materials, contaminate groundwater, and damage the metropolitan power and transportation grids. The disruption in transportation that could result from a major flood could affect the Airport and interstate and state highways. In addition, displacement of residents, businesses, agriculture, and recreational areas could occur. Resulting damage could hinder community growth, stability, and cohesion.

The NLIP was initially outlined in the *Natomas Levee Evaluation Study Final Report Prepared for SAFCA in Support of the Natomas Basin Components of the American River Common Features* (SAFCA 2006). This evaluation was based on the engineering studies and reports that were included as appendices to the above-referenced report, which are available for review at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California. These studies and reports indicate that segments of the Natomas perimeter levee system reflect the

following problems for both the FEMA 100-year (0.01 AEP) and the 200-year (0.005 AEP) design water surface elevations:

- inadequate levee height,
- through-levee seepage and foundation underseepage with excessive hydraulic gradients,
- embankment instability, and
- susceptibility to riverbank erosion and scour.

Although not highlighted in the levee evaluation report, portions of the perimeter levee system, particularly along the east levee of the Sacramento River, are also subject to vegetative and structural encroachments into the levee prism.

In January 2008, FEMA remapped the Natomas Basin as an AE zone, and the flood zone designation took effect in December 2008. FEMA defines AE zones as areas with a 0.01 AEP of flooding. The designation requires mandatory flood insurance purchases by homeowners and requires that the bottom floor of all new buildings be constructed at or above base flood elevation—as little as 3 feet above ground level in some of the Natomas Basin but up to 20 feet above ground level in much of the Basin. This designation and the associated constraints effectively stopped all projects that were not issued building permits before the new maps took effect.

The following subsections describe the problems and needs related to project implementation.

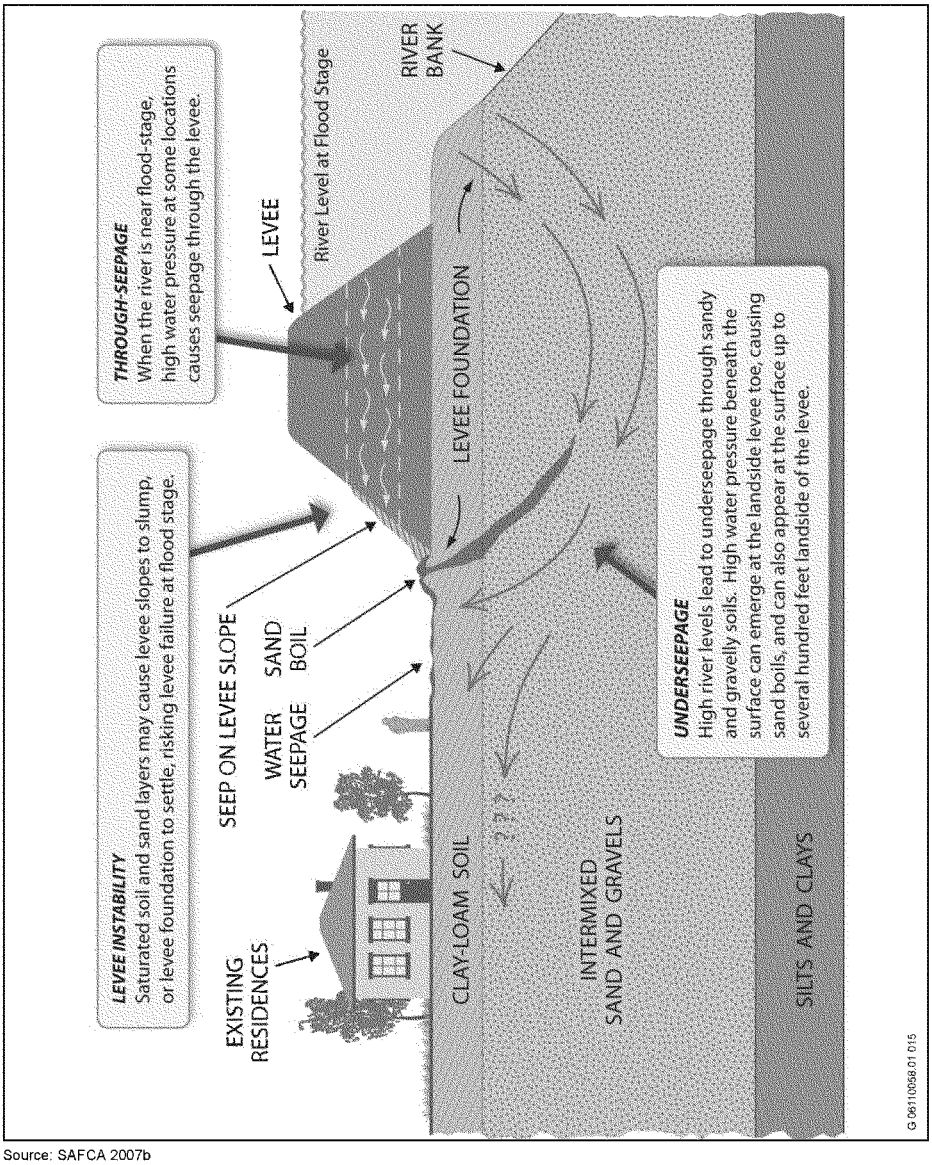
1.4.2.1 Flood Problems and Needs

Inadequate Levee Height

"Levee height" refers to a measure of the height of a levee above a defined water surface elevation. The NCC south levee and Reaches C:1–4B and B:5A–11 of the Sacramento River east levee provide less than the 3 feet of additional levee height that is required to meet the minimum requirements for 100-year (0.01 AEP) flood risk reduction established by FEMA as part of the National Flood Insurance Program, or the minimum requirements for 200-year flood risk reduction (0.005 AEP) established by the State. Both the FEMA 100- (0.01 AEP) and the 200-year (0.005 AEP) design water surface elevations were derived using hydraulic modeling outputs that assume SRFCP levees outside the Natomas Basin do not fail when overtopped. **Plate 1-3** shows the locations and amounts of levee height deficiency that would be addressed by the NLIP Landside Improvements Project.

Seepage

Seepage beneath and through segments of the Natomas levee system has been identified as a significant risk to the stability and reliability of the system (SAFCA 2006). Underseepage problems occur in locations where levees are constructed on low-permeability foundation soil (silt and clay) underlain by higher-permeability layers (sand and gravel). Excessive underseepage makes the affected levee segment susceptible to failure during periods of high river stage. Under these conditions, seepage travels horizontally under the levee and then is forced vertically upward through the low-permeability foundation layer, often referred to as the "blanket." Failure of the blanket can occur either by uplift, a condition in which the blanket does not have enough weight to resist the confined pressure acting upon the bottom of the blanket, or by piping (internal erosion) caused by water flowing under high vertical gradients through the erodible blanket and carrying fine soil particles out of the foundation materials. Through-seepage is seepage through a levee embankment that can occur during periods of high river stage. Depending on the duration of high water and the permeability of embankment soil, seepage may exit the landside face of the levee. Seepage can also pass directly through pervious layers in the levee if such layers are present. Under these conditions, the stability of the landside levee slope may be reduced. **Plate 1-4** shows a schematic of these two failure mechanisms.



Source: SAFCA 2007b

Underseepage and Through-Seepage Levee Risks **Plate 1-4**

Riverbank Erosion

As shown in **Plate 1-5**, 15 sites along the waterside of the Sacramento River east levee are subject to bank erosion in the form of bed or toe scour and wave wash that threatens the stability of the adjacent levee. Risk priorities have been assigned to the affected sites based primarily on the risk of slope failure due to undermining. High-risk sites exhibit one or more of the following characteristics and are considered potentially susceptible to failure in a 100-year flood event:

- the toe of the bank lies inside or very near the levee template and the slope below the waterline is reasonably steep, scour depths are below river bed elevations at the toe, or the local bed has been observed to be lowering;
- the toe of the bank lies outside the levee template but there is risk of cantilever failure based on the estimated stratigraphy of the bank; or
- the bank at the low-water elevation (the contact between the flood basin deposits and the alluvial deposits) lies near the levee template, and there is potential for a failure originating at the contact point to intersect the levee prism. If the failure seems unlikely to intersect the levee prism, the site is ranked as moderate.

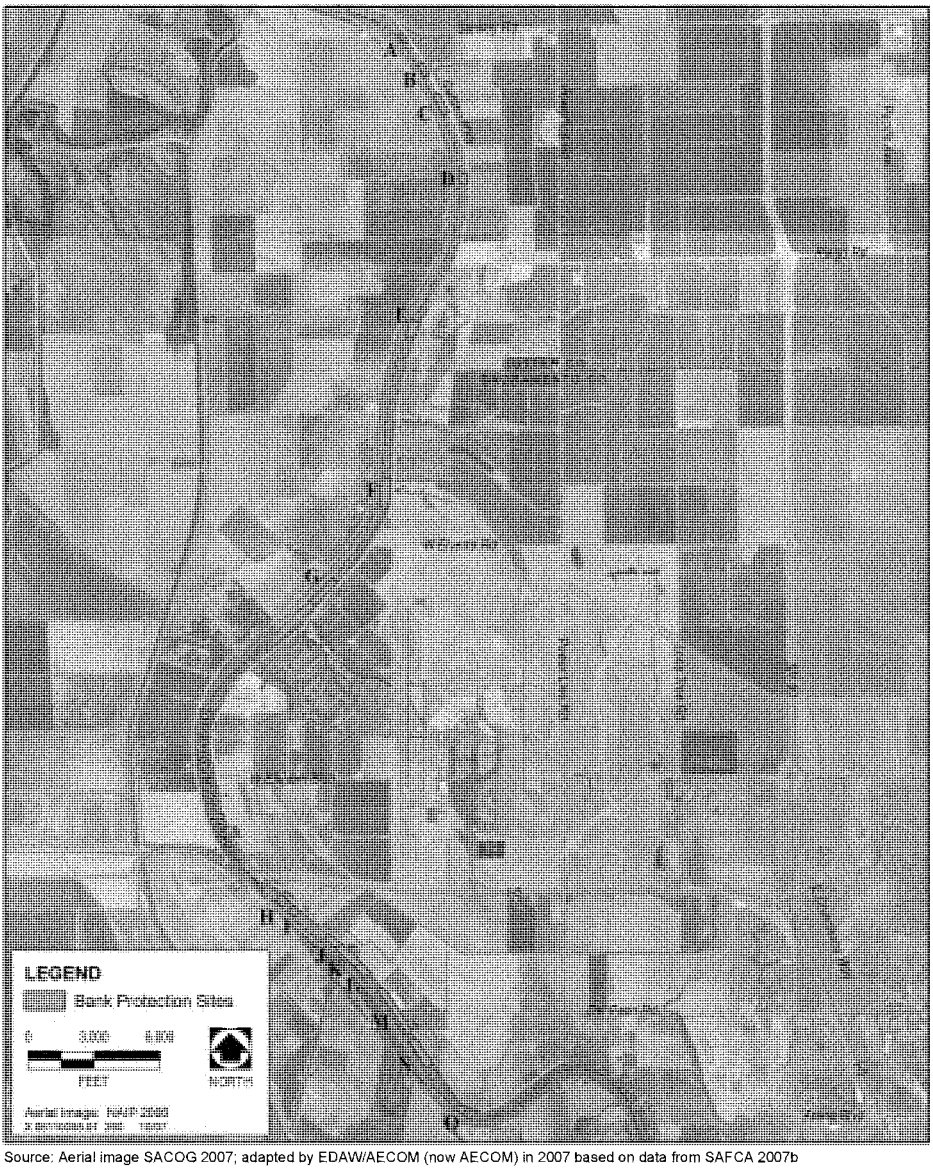
Moderate-risk sites exhibit one or more of the following characteristics:

- the toe of the bank lies reasonably close to the levee template, but the slope below the waterline is moderate and general scour elevations are not very far beneath the local bed level;
- the bank at the low-water elevation (the contact between the flood basin deposits and the alluvial deposits) lies inside the levee template, but an individual failure is unlikely to intersect the levee prism; or
- the toe of the bank lies from 20 to 50 feet from the levee template and the risk of slope failure is low to moderate, but erosion appears to be very active or specific site factors, such as lack of vegetation, structures, or fallen trees, suggest that erosion might proceed very quickly during a large flood.

Sites A (River Mile [RM] 78.6), C (RM 78.0), D (RM 77.3), G (RM 73.5), J (RM 69.8), and M (RM 68.8) are considered high-risk sites. Sites B (RM 78.2), I (RM 70.0), K (RM 69.4), and L (RM 69.1) are considered moderate-risk sites.

Levee Encroachments

USACE levee guidance requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes. This guidance also may require removal of encroachments on the levee slopes, including utilities, fences, structures, retaining walls, driveways, and other features that penetrate the levee prism or affect operation and maintenance of the levee system. Substantial encroachments are present on the Sacramento River east levee. **Plates 1-6a** and **1-6b** illustrate typical encroachments in the area. Should any of these existing encroachments be determined to threaten the integrity of the levee or otherwise increase flood risk unacceptably, the encroachments would need to be removed. RD 1000 is the entity initially responsible for removing encroachments that have been identified as threatening levee integrity. Any such encroachment removal would be subject to future, separate environmental compliance and review.



Source: Aerial image SACOG 2007; adapted by EDAW/AECOM (now AECOM) in 2007 based on data from SAFCA 2007b

Natomas Basin Erosion Sites **Plate 1-5**

Source: Photographs taken by EDAW/AECOM (now AECOM) in 2007

Examples of Waterside Encroachments on the Sacramento River East Levee **Plates 1-6a and 1-6b**

1.4.2.2 Other Problems and Needs Related to Project Implementation

Aviation Safety

The Airport is located approximately 1.5 miles east of the Sacramento River east levee and 12 miles north of downtown Sacramento. The Airport includes the Airport Operations Area and adjacent terminals, parking lots, and landscaped areas **(Plate 1-7)**. There are two 8,600-foot parallel runways, oriented roughly north-south, and three airline terminals, as well as additional buildings associated with various airport operations. Approximately half of the 5,900 acres of Sacramento County-owned land at the Airport are located due south and due north of the Airport Operations Area and function as aviation "bufferlands" to prevent encroachment by land uses, such as residential development, that are incompatible with aircraft operations.

The Airport has one of the highest numbers of reported bird strikes of all California airports. The frequency of these strikes is directly related to the Airport's location in the western portion of the Natomas Basin, which is a relatively flat, low-lying area, along the Pacific Flyway, dominated by agricultural crop lands and supporting irrigation and drainage infrastructure. These agricultural uses are the primary wildlife attractants in the area, with rice cultivation, including flooding of the rice fields in winter and summer, considered the most significant attractant.

Since 1996, the FAA has required the Airport to maintain and implement a Wildlife Hazard Management Plan (WHMP). The WHMP relies on a combination of wildlife control and land management strategies and outlines steps for monitoring, documenting, and reporting potential wildlife hazards and bird strikes. In accordance with FAA Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* (FAA 2007), the Airport has been directed by the FAA to reduce wildlife attractants in the Airport Critical Zone, the area within a 10,000-foot radius from the centerline of the two parallel runways for turbine-powered aircraft.

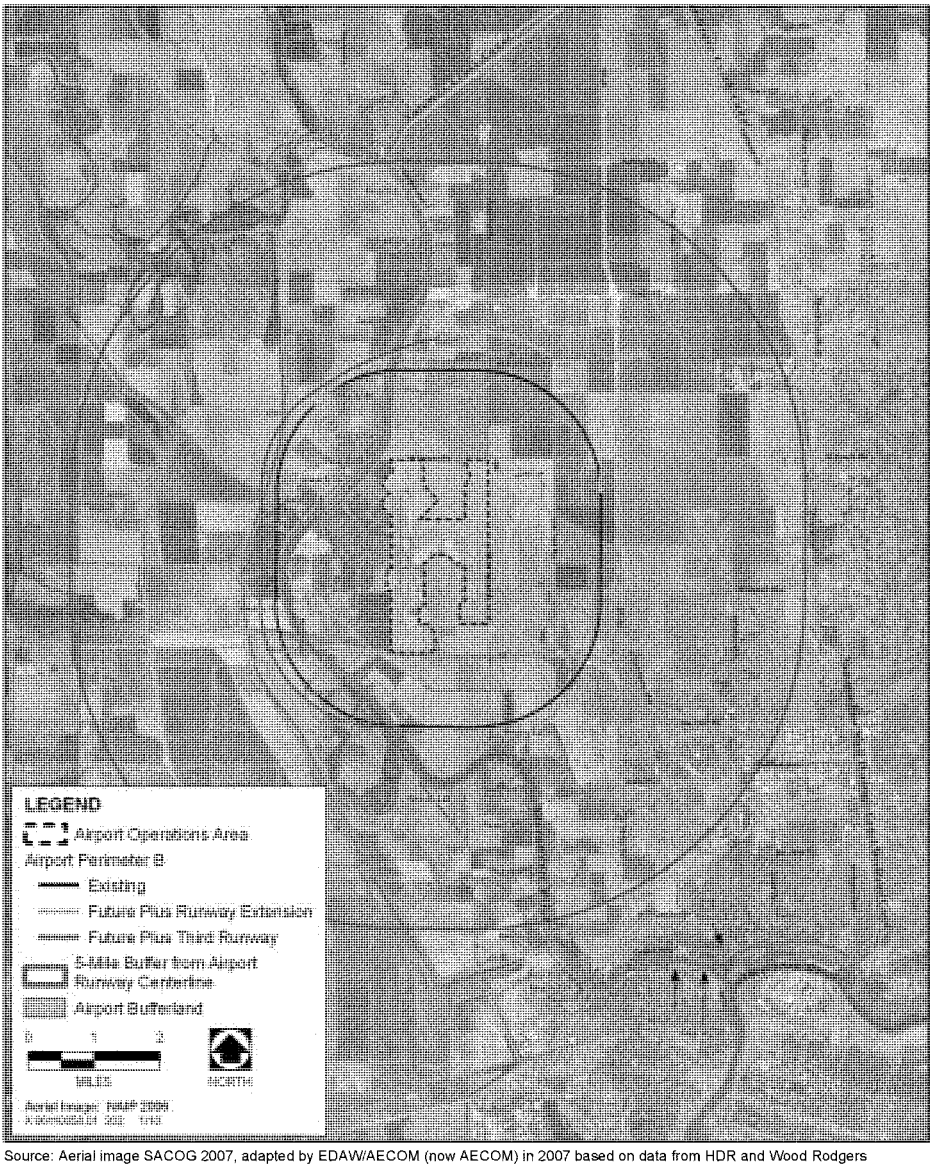
The following land management objectives in the WHMP are relevant to the proposed early implementation project:

- maintain grasslands in the Airport Operations Area (the area within the fenced perimeter of the Airport) to discourage use by hazardous wildlife;
- reduce aquatic habitat that promotes hazardous wildlife;
- reduce hazardous wildlife use of ditches in the Airport Operations Area; and
- reduce hazardous wildlife on Sacramento County–owned agricultural land in the 10,000-foot Airport Critical Zone.

Habitat Conservation

The Natomas Basin provides habitat for a variety of wildlife species, ranging from those that use the widely distributed agricultural fields and levee maintenance zones to species that are restricted to remnant patches of native vegetation and the area's historical agricultural irrigation and drainage ditches and canals. Many common wildlife species use the project area, and a number of special-status species also have potential to occur within and adjacent to the levee improvement areas. These special-status species include the following:

- valley elderberry longhorn beetle
- giant garter snake
- northwestern pond turtle
- Swainson's hawk
- burrowing owl
- northern harrier
- other nesting birds
- rose mallow
- Delta tule pea
- Sanford's arrowhead



Source: Aerial image SACOG 2007, adapted by EDAW/AECOM (now AECOM) in 2007 based on data from HDR and Wood Rodgers

Sacramento International Airport Operations Area, Perimeter B, and Bufferlands **Plate 1-7**

The NBHCP was developed by the City of Sacramento, Sutter County, and TNBC in 2003 to promote conservation of the NBHCP-covered species in conjunction with economic and urban development in the Natomas Basin. The NBHCP establishes a conservation program designed to minimize and mitigate the expected loss of habitat values and incidental take of "covered species" that could result from urban development and operation and maintenance of irrigation and drainage systems. The NBHCP currently authorizes take associated with 17,500 acres of urban development in southern Sutter County and within the city of Sacramento. The U.S. Fish and Wildlife Service (USFWS) approved the NBHCP in 2003 and issued incidental take permits to the City of Sacramento and Sutter County for take of Federally listed species resulting from permitted activities.

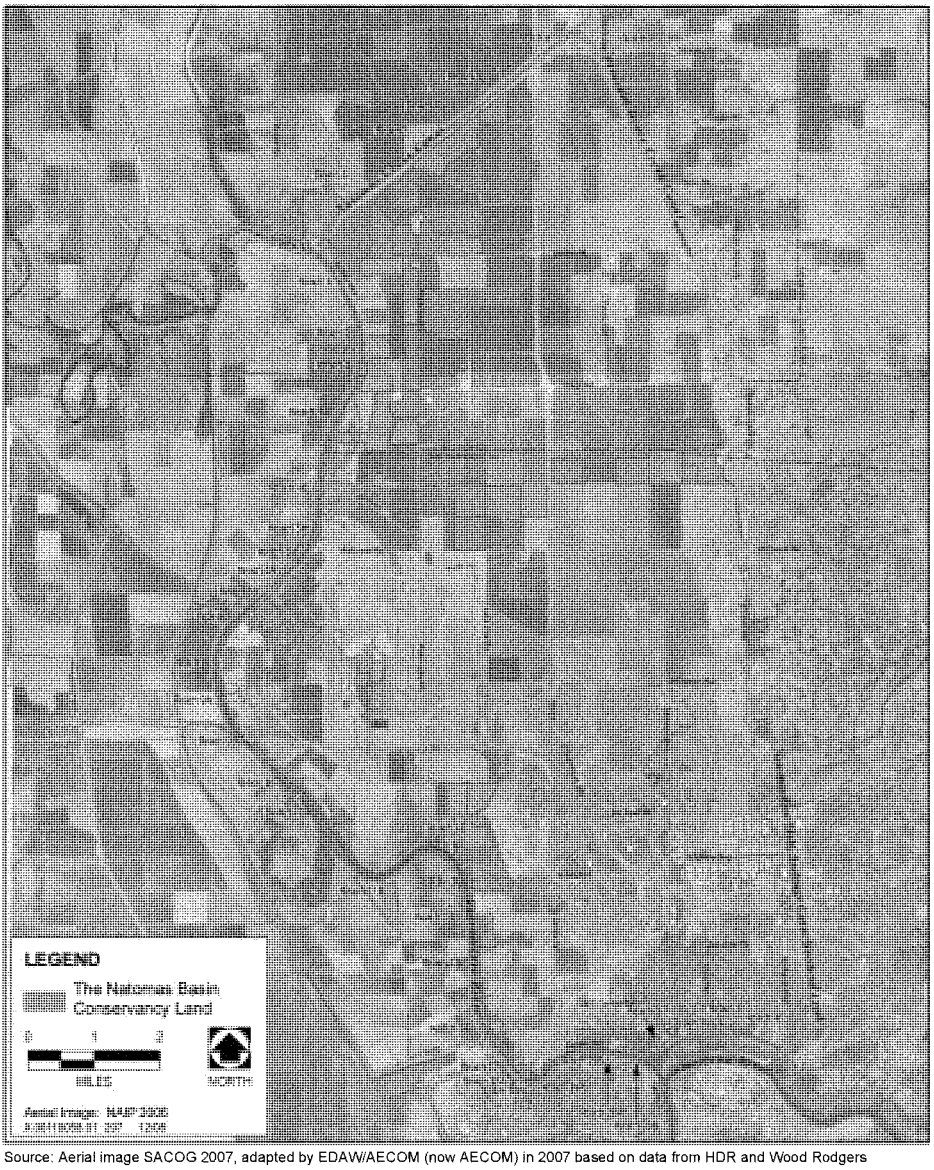
The NBHCP's habitat reserve acquisition and management activities are implemented by TNBC, a private, nonprofit organization that began operating in 1998 and whose mission is to serve as "plan operator" of the NBHCP. TNBC receives mitigation fees paid by developers and other NBHCP participants. These funds are used to acquire, establish, enhance, monitor, and manage mitigation lands in perpetuity. As development occurs within the Natomas Basin, and as TNBC acquires mitigation lands, site-specific management plans are implemented by TNBC to ensure that the objectives of the NBHCP are fulfilled. These management plans may include excavation and grading of the acquired lands to create marsh habitats reflective of the floodplain conditions that prevailed in portions of the Natomas Basin before reclamation.

As of June 2009, approximately 4,115 acres of mitigation property have been acquired in the Natomas Basin. As shown in **Plate 1-8**, this property is concentrated in three areas: north of the Airport and west of State Route (SR) 99 in Sutter County, east of the Airport between Elverta Road and the Sacramento/Sutter County border in Sacramento County, and south of the Airport in the vicinity of Fisherman's Lake in Sacramento County. TNBC's Agricultural Irrigation and Drainage Infrastructure

goal is to consolidate these three blocks of land through infill acquisitions and to ensure that these lands are reliably served and connected by the Natomas Basin's historical agricultural irrigation and drainage infrastructure.

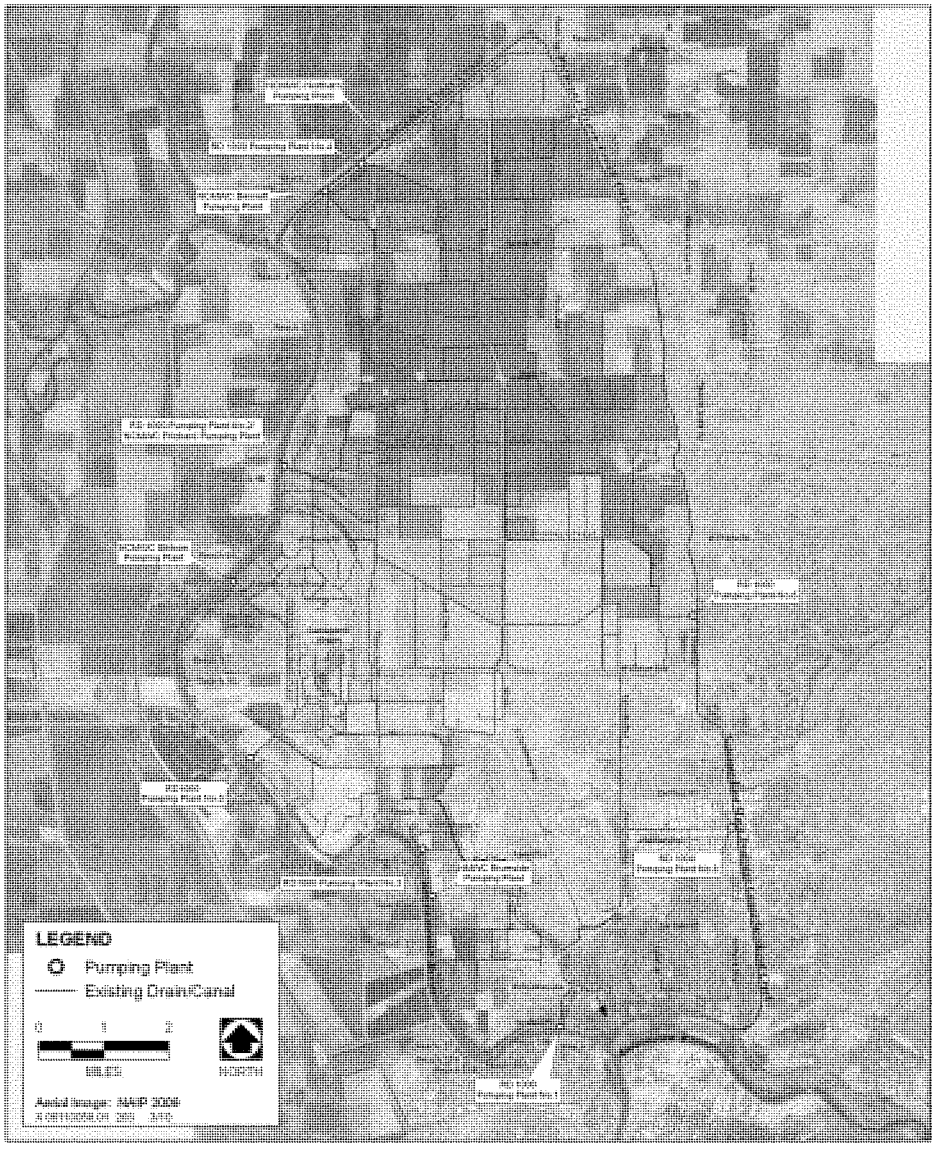
Reclamation of the Natomas Basin for agricultural development required construction of two major ditch and canal systems in the Basin: an irrigation system owned and operated by Natomas Central Mutual Water Company (NCMWC) and a drainage system owned and operated by RD 1000. NCMWC pumps water into the Basin to provide irrigation water to its shareholders for agricultural use within the Basin. During winter (October through April), drainage is primarily rainfall runoff; during summer (May through September), drainage water from agricultural fields is typically recirculated for irrigation. Because the Basin is surrounded by levees, all excess drainage within the Basin must be pumped out. In general, water is pumped into the Basin from the Sacramento River and NCC as irrigation water and returned to the perimeter drainage channels via RD 1000's interior drainage system.

Several irrigation canals, pipelines, wells, and pump stations exist along the Sacramento River east levee. These include the Elkhorn Main Irrigation Canal (Elkhorn Canal), which runs parallel to the Sacramento River east levee from the North Drainage Canal to just south of West Elkhorn Boulevard, and the Riverside Main Irrigation Canal (Riverside Canal), which runs parallel to the Sacramento River east levee from approximately 1 mile north of San Juan Road to approximately Orchard Lane. These NCMWC canals are fed by three pumping plants on the Sacramento River (**Plate 1-9**). These canals are referred to as "highline" canals because they have embankments that allow water levels to be maintained above surrounding ground surfaces so that water can be delivered to agricultural receiving lands by gravity flow. The NCMWC also operates two pumps along the NCC south levee that provide irrigation water to agricultural lands in the northern portion of the Basin. These NCMWC irrigation systems and several other landowner-operated systems along the Sacramento River east levee, NCC south levee, and PGCC west levee would need to be relocated to accommodate improvements to these levees.



Source: Aerial image SACOG 2007, adapted by EDAW/AECOM (now AECOM) in 2007 based on data from HDR and Wood Rodgers

The Natomas Basin Conservancy Lands **Plate 1-8**



Source: Aerial image SACOG 2007; adapted by EDAW/AECOM (now AECOM) in 2007 based on data from Eric Hansen

Existing Natomas Basin Drainage and Irrigation Features **Plate 1-9**

RD 1000 operates several drainage pumping plants along the Sacramento River east levee, the NCC south levee, and the NEMDC west levee that could be affected by levee improvement activity. As shown in **Plate 1-9**, Pumping Plant No. 2, located in Sacramento River Reach C:4B, pumps drain water from the lower end of the North Drainage Canal; Pumping Plant No. 3, located in Sacramento River east levee Reach B:13, pumps drain water from the West Drainage Canal; Pumping Plant No. 1, located in Sacramento River east levee Reach A:20A, pumps drain water from the Main Drainage Canal; Pumping Plant No. 4, located in NCC Reach D:2, pumps drain water from the upper end of the North Drainage Canal; Pumping Plant No. 5, located in Sacramento River east levee Reach B:10, pumps drain water from the West Drainage Canal; Pumping Plant No. 8, located on the NEMDC west levee between Del Paso Road and North Market Boulevard, pumps drain water from the C-1 Drain; and Pumping Plant No. 6, located on the NEMDC west levee between Elverta Road and Elkhorn Boulevard, pumps drain water from the E Drain. These pumping facilities include discharge pipelines that would need to be relocated as part of the levee improvements in these locations. Pumping Plant No. 2 was temporarily removed as part of an emergency levee repair in 2006 but will be reconstructed as part of the Phase 3 Project, planned for construction in 2010.

The City of Sacramento operates the Willow Creek stormwater pumping station, which is located in Sacramento River Reach A:19B; Pump Station 58, which is located on the American River north levee at Asuza Street; and Pump Station 102, which is located on the NEMDC west levee in Gardenland Park.

1.5 ENVIRONMENTAL REGULATORY FRAMEWORK AND RELATIONSHIP OF THIS EIS/EIR TO OTHER DOCUMENTS

1.5.1 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA provides an interdisciplinary framework for Federal agencies to develop information that will help them to take environmental factors into account in their decision-making (42 USC Section 4321, 40 CFR Section 1500.1). According to NEPA, an EIS is required whenever a proposed major Federal action (e.g., a proposal for legislation or an activity financed, assisted, conducted, or approved by a Federal agency) would result in significant effects on the quality of the natural and human environment.

Implementation of the project is dependent upon Federal action because it would require Federal approval for one or more of the following activities, depending on the project proponent: (i) Congressional authorization (USACE); (ii) alteration of Federal project levees (requires permission from USACE pursuant to Section 408) (SAFCA); (iii) placement of fill material into jurisdictional waters of the United States (requires permission from USACE pursuant to Section 404) (SAFCA); (iv) work performed in, over, or under navigable waters of the United States (such as excavation of material from or deposition of material into navigable waters) (requires permission from USACE under Section 10) (SAFCA); and (v) activities affecting plant or animal species protected by the Federal Endangered Species Act (ESA) (16 USC Section 1531[c][1][2]) (USACE and SAFCA). An EIS is used by Federal agencies in making decisions and is intended to provide full and open disclosure of environmental consequences prior to agency action.

As discussed above under Section 1.1.1, "Scope of Environmental Analysis," this EIS/EIR is tiered from, or incorporates by reference, where appropriate, information contained in previous environmental documents completed for the NLIP. Incorporation of previous analysis by reference is encouraged for NEPA analysis under the Council on Environmental Quality (CEQ) regulations (40 CFR Sections 1500.4, 1502.21). Section 1502.21 reads:

> Agencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described. No material may be incorporated by reference unless it is reasonably available for inspection by

potentially interested persons within the time allowed for comment. Material based on proprietary data which is itself not available for review and comment shall not be incorporated by reference.

NEPA requires a citation and brief summary of the referenced material, as well as the public availability of the referenced material.

1.5.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

According to the State CEQA Guidelines (14 CCR Section 15064[f][1]), preparation of an EIR is required whenever a project may result in a significant environmental impact. An EIR is an informational document used to inform public agency decision makers and the general public of the significant environmental effects of a project, identify possible ways to mitigate or avoid the significant effects, and describe a range of reasonable alternatives to the project that could feasibly attain most of the basic objectives of the project while substantially lessening or avoiding any of the significant environmental impacts. Public agencies are required to consider the information presented in the EIR when determining whether to approve a project.

CEQA requires that state and local government agencies consider the environmental effects of projects over which they have discretionary authority before taking action on those projects (California Public Resources Code [PRC] Section 21000 et seq.). CEQA also requires that each public agency avoid or reduce to less-than-significant levels, wherever feasible, the significant environmental effects of projects it approves or implements. If a project would result in significant environmental impacts that cannot be feasibly mitigated to less-than-significant levels, the project can still be approved, but the lead agency's decision makers must issue a "statement of overriding considerations" explaining in writing the specific economic, social, or other considerations that they believe, based on substantial evidence, make those significant and unavoidable effects acceptable.

As discussed above under Section 1.1.1, "Scope of Environmental Analysis," this EIS/EIR is tiered from, and incorporates by reference, where appropriate, information contained in previous environmental documents completed for the NLIP. Under CEQA, tiering is encouraged and incorporation by reference is authorized (California PRC Sections 21093 and 21094; State CEQA Guidelines CCR Sections 15150 and 15152). Under CCR Section 15152 of the State CEQA Guidelines, when CEQA documentation has been performed for a program of projects, project-specific studies for subsequent projects within the program should be limited to effects which:

- were not examined as significant effects on the environment in the prior EIR; or
- are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means (State CEQA Guidelines CCR Section 15152[d]).

CEQA requires citation to and a brief summary of the referenced material, as well as the public availability of the referenced material. Relevant portions of all documents incorporated by reference into this EIS/EIR are summarized throughout this EIS/EIR where specifically noted (State CEQA Guidelines CCR Section 15150). See Section 1.10, "Related NEPA Documents, Documents Relied on in Preparation of This EIS/EIR, and Documents Incorporated by Reference."

1.5.3 PROJECT AUTHORIZATION

Federal financial participation in the project would require additional action by Congress based on the results of the Common Features/Natomas PACR, as discussed above.

SAFCA is authorized to proceed with the early implementation project as approved by the SAFCA Board of Directors in April 2007 and as funded in part by the Consolidated Capital Assessment District that was formed in April 2007. In October 2007, the California Legislature approved, and the Governor signed, Senate Bill 276

authorizing the state's participation in the project. The state has the capability to fund its share of the project cost under the authorities created by the passage of Propositions 1E and 84 in November 2006.

1.5.4 NATOMAS LEVEE IMPROVEMENT PROGRAM ENVIRONMENTAL DOCUMENTATION

The relationship of the NLIP Landside Improvement Project phases to one another and their relationship to this EIS/EIR are summarized below. **Table 4.18-1** presents the major components of the NLIP Landside Improvements Project and construction timing of each project phase; these are also shown in **Plates 2-7a** and **2-7b**.

1.5.4.1 PHASE 1 PROJECT

On February 16, 2007, the SAFCA Board of Directors certified the Local Funding EIR (SAFCA 2007a), which examined the physical environmental effects associated with the program of flood damage reduction measures and related mitigation and habitat enhancements that the local funding mechanisms would be used to finance. The Local Funding EIR covered the NLIP Landside Improvements Project Phases 1–4 at a program level of detail and the Phase 1 Project (NCC South Levee Phase 1 Improvements) at a project-specific level of detail. The Phase 1 Project was constructed in 2007 and 2008.

1.5.4.2 PHASE 2 PROJECT

On November 29, 2007, the SAFCA Board of Directors certified the Phase 2 EIR (SAFCA 2007c), which covered the three additioual phases of "landside" components of the NLIP that were proposed for construction in 2008 (Phase 2 Project), 2009 (Phase 3 Project), and 2010 (Phase 4 Project, including sub-phases a and b). The Phase 2 EIR was tiered from the analysis in the Local Funding EIR, consistent with CCR Section 15152 of the State CEQA Guidelines. The 2008 construction phase (now referred to as the Phase 2 Project) was analyzed at a project level, and the 2009–2010 construction phases (now referred to as the Phase 3, 4a, and 4b Projects, or the remainder of the Landside Improvements Project) were analyzed at a program level.

To implement the Phase 2 Project, SAFCA required permission from USACE pursuant to Section 408 for alteration of a Federal project levee and Section 404 for the discharge of fill into jurisdictional waters of the United States. Therefore, following completion of the Phase 2 EIR and local approval of the Phase 2 Project, USACE prepared the Phase 2 EIS (USACE 2008). A record of decision (ROD) was issued on January 21, 2009, at which time USACE also issued the 408 permission and 404 permit for the Phase 2 Project.

The Phase 2 Project as presented in the Phase 2 FEIS differs from the Phase 2 Project as evaluated in the 2007 Phase 2 EIR for the following reasons. By the time the Phase 2 DEIS began, SAFCA's engineering consultants had determined that cutoff walls could be used instead of berms along several of the Sacramento River east levee reaches. Thus, the Phase 2 FEIS includes proposed cutoff walls in some Sacramento River east levee reaches and a discussion of the impacts of the cutoff walls on groundwater recharge. Additionally, it became clear during the EIS process that much of the 2008 construction phase (or Phase 2 Project) would actually have to be conducted in 2009. The Phase 2 FEIS therefore acknowledges that possibly all of the Phase 2 Project construction could be concurrent with construction of the Phase 3 Project, and discusses the worst-case consequences to haul truck traffic, noise, air quality, and other construction-related effects accordingly.

These differences were considered in the Phase 2 SEIR (SAFCA 2009a), prepared by SAFCA, which was certified by the SAFCA Board of Directors on January 29, 2009, at which time the Board also approved the modifications to the Phase 2 Project. Subsequently, two addenda to the Phase 2 EIR were prepared by SAFCA to evaluate additional minor modifications to the Phase 2 Project; the first Addendum to the Phase 2 EIR (SAFCA 2009c) was certified by the SAFCA Board of Directors on June 8, 2009 and the 2nd Addendum to the Phase 2 EIR

(SAFCA 2009d) was certified on August 20, 2009. The Phase 2 Project can be constructed on a stand-alone basis, assuming no further action on the balance of the NLIP is taken.

Construction of the Phase 2 Project began in May 2009 and is anticipated to be completed in 2010, assuming receipt of all required environmental clearances and permits. It is clear that a portion of Phase 2 Project construction will likely be complete prior to construction of the Phase 3 Project. However, it is still likely that there will be some overlap in construction schedules between these two phases (see below).

1.5.4.3 PHASE 3 PROJECT

On February 13, 2009, USACE and SAFCA issued the Phase 3 DEIS/DEIR for public review and comment. Following public review, SAFCA prepared an FEIR (SAFCA 2009b) to provide responses to comments on the Phase 3 DEIS/DEIR. The SAFCA Board of Directors certified the FEIR and approved the Phase 3 Project on May 21, 2009. Separately, USACE prepared an FEIS (USACE 2009) that was issued for public review on August 21, 2009. A ROD was issued on April 2, 2010, at which time USACE also issued the 408 permission and 404 permit for the Phase 3 Project.

After the May 21, 2009 certification of the Phase 3 EIR, SAFCA made minor modifications to the design of the Phase 3 Project. An addendum to the Phase 3 EIR (SAFCA 2009e) was prepared by SAFCA to evaluate these modifications; the SAFCA Board of Directors certified the Addendum and approved the modifications to the Phase 3 Project on September 17, 2009.

To construct the Phase 3 Project with minimal interruption of and conflict with drainage/irrigation services and wildlife habitat (specifically, giant garter snake habitat), some Phase 3 Project components need to be constructed in 2009 in advance of the Phase 3 Project's major levee construction that is scheduled to occur in 2010. To facilitate this staged construction, a staged permitting approach was developed for the Phase 3 Project. Specifically, irrigation and drainage infrastructure (termed the Phase 3a Project) was permitted by USACE and the Central Valley RWQCB under Sections 404 and 401, respectively, of the Clean Water Act, on October 7, 2009. Some vegetation encroachments would also occur during the non-nesting season for raptors and other bird species. A separate, but related, set of permits for the Phase 3 Project's levee construction and related pumping plant improvements (termed the Phase 3b Project) was issued in spring 2010.

Preliminary construction (canal work, utility relocation, vegetation removal, and demolition of structures) of the Phase 3 Project (3a) began in fall 2009, with major levee construction (3b) planned to begin in 2010, assuming receipt of all required environmental clearances and permits. The potential exists for up to 30% of the Phase 2 Project to also be constructed in 2010, concurrent with major Phase 3 Project levee construction, or even potentially concurrently with the Phase 4a Project, depending on the timing and availability of funding, and environmental clearances and permits.

1.5.4.4 PHASE 4a PROJECT

On August 28, 2009, USACE and SAFCA issued the Phase 4a DEIS/DEIR for public review and comment. Following public review, SAFCA prepared an FEIR (SAFCA 2009f). The SAFCA Board of Directors certified the FEIR and approved the Phase 4a Project on November 13, 2009. Separately, USACE prepared an FEIS (USACE 2010) that was issued for public review in February 2010. USACE will consider whether to grant Section 408 permission and issue permits under Sections 404 and 10, and document its decision in a ROD, expected in summer 2010. If permitted, the Phase 4a Project could be constructed at the same time as portions of the Phase 3 Project. Construction of the Phase 4a Project is planned to begin in 2011 and to be completed in 2012, assuming receipt of all required environmental clearances and permits.

1.5.4.5 PHASE 4b PROJECT

This EIS/EIR evaluates at a project-level the direct, indirect, and cumulative effects of the Phase 4b Project, which was evaluated at a program level in the Local Funding EIR, Phase 2 EIR, and Phase 2 EIS. Construction is planned to begin as early as 2012 and anticipated to be completed in 2016, assuming receipt of Congressional authorization, funding (if SAFCA pursues without Federal participation), and all required environmental clearances and permits.

1.6 SCOPE AND FOCUS OF THIS EIS/EIR

Pursuant to the CEQ, USACE's NEPA regulations, CEQA, and the State CEQA Guidelines (CCR Section 15064), the discussion of potential effects on the environment in this EIS/EIR is focused on those impacts that USACE and SAFCA have determined may be potentially significant.

This EIS/EIR includes an evaluation of 16 environmental issue areas and other NEPA- and CEQA-mandated issues (e.g., cumulative impacts and growth-inducing impacts). The 16 environmental issue areas are as follows:

- Agricultural Resources
- Land Use, Socioeconomics, and Population and Housing
- Geology, Soils, and Mineral Resources
- Hydrology and Hydraulics
- Water Quality
- Biological Resources
- Cultural Resources
- Paleontological Resources
- Transportation and Circulation
- Air Quality
- Noise
- Recreation
- Visual Resources
- Utilities and Services Systems
- Hazards and Hazardous Materials
- Environmental Justice

1.7 AGENCY ROLES AND RESPONSIBILITIES

As stated above, USACE is the Federal lead agency for NEPA, and SAFCA is the state lead agency for CEQA.

1.7.1 COOPERATING, RESPONSIBLE, AND TRUSTEE AGENCIES

Under NEPA, any Federal agency other than the lead agency that has jurisdiction by law or special expertise with respect to any environmental impact involved in an action requiring an EIS is eligible to be a cooperating agency (CFR Section 1501.6). Cooperating agencies are encouraged to actively participate in the NEPA process of the Federal lead agency, review the NEPA documents of the Federal lead agency, and use the documents when making decisions on the project.

Under CEQA, a responsible agency is a public agency, other than the lead agency, that has responsibility to carry out or approve a project (California PRC Section 21069). A trustee agency is a state agency that has jurisdiction by law over natural resources that are held in trust for the people of the State of California (California PRC Section 21070).

1.7.1.1 FEDERAL COOPERATING AGENCY AND NON-FEDERAL SPONSOR

As stated above, the FAA is serving as a cooperating agency for NEPA, and the CVFPB is serving as a non-Federal sponsor of USACE's Common Features/Natomas PACR.

1.7.1.2 STATE RESPONSIBLE AND TRUSTEE AGENCIES

The following state agencies may serve as responsible and trustee agencies if they have jurisdiction or regulatory approval over the project or a portion of the project:

- California Air Resources Board
- California Department of Education
- California Department of Fish and Game
- California Department of Toxic Substances Control
- California Department of Transportation
- California Department of Water Resources
- California State Lands Commission
- California State Office of Historic Preservation
- Central Valley Flood Protection Board (formerly the State Reclamation Board)
- Central Valley Regional Water Quality Control Board (Region 5)
- State Water Resources Control Board

1.7.1.3 REGIONAL AND LOCAL RESPONSIBLE AGENCIES

The following regional and local agencies may serve as responsible agencies if they have jurisdiction or regulatory approval over the project or a portion of the project:

- County of Sacramento
- County of Sutter
- City of Sacramento
- Feather River Air Quality Management District
- Natomas Central Mutual Water Company
- Natomas Unified School District
- Reclamation District No. 1000
- Reclamation District No. 1001
- Robla School District
- Sacramento Area Sewer District
- Sacramento County Environmental Management Department
- Sacramento County Local Agency Formation Commission
- Sacramento County Municipal Services Agency
- Sacramento County Water Agency (Zone 41 and 11C Water Districts)
- Sacramento Metropolitan Air Quality Management District
- Sacramento Metropolitan Fire District
- Sacramento Municipal Utility District
- Sacramento Regional County Sanitation District
- Sutter County Environmental Health Services
- Twin Rivers Unified School District

1.7.2 REGULATORY REQUIREMENTS, PERMITS, AND APPROVALS

1.7.2.1 FEDERAL ACTIONS/PERMITS

The Federal actions, authorizations, permissions, or permits that would be required for project implementation are listed below.

- **U.S. Army Corps of Engineers:** Decision on whether or not to grant permission for the Phase 4b Project under Sections 408 and 10, and decision on whether to issue a permit under Section 404 (only needed if

Congress does not provide authorization and SAFCA chooses to proceed with the Phase 4b Project without Federal participation).

- **National Marine Fisheries Service:** Federal ESA consultation and incidental-take authorization for the take of, or concurrence with conclusion of no effect for, Federally listed endangered and threatened species.
- **U.S. Environmental Protection Agency:** Reviewing and commenting on the EIS, filing and noticing the EIS, concurrence with Section 404 Clean Water Act permit, and Clean Air Act conformity.
- **U.S. Fish and Wildlife Service:** Federal ESA consultation and incidental-take authorization for the take of, or concurrence with conclusion of no effect for, Federally listed endangered and threatened species.

1.7.2.2 STATE ACTIONS/PERMITS

The state actions or permits that would be required for project implementation are listed below.

- **California Department of Fish and Game, Sacramento Valley:** Compliance with the California Endangered Species Act, streambed alteration (California Fish and Game Code Section 1602), Section 2081 permit, and protection of raptors (California Fish and Game Code Section 3503.5).
- **California Department of Transportation:** Encroachment permit and/or transportation management plan.
- **California State Office of Historic Preservation:** National Historic Preservation Act Section 106 compliance in relation to Federal project authorizations.
- **Central Valley Flood Protection Board (formerly the Reclamation Board) and Reclamation District Nos. 1000 and 1001:** levee and floodway and other encroachment permits (only needed if Congress does not provide authorization and SAFCA chooses to proceed with the Phase 4b Project without Federal participation).
- **Central Valley Regional Water Quality Control Board (Region 5):** National Pollutant Discharge Elimination System construction stormwater permit (Notice of Intent to proceed under General Construction Permit) for disturbance of more than 1 acre, discharge permit for stormwater, general order for dewatering, and Clean Water Act Section 401 certification or waste discharge requirements.

1.7.2.3 REGIONAL AND LOCAL ACTIONS/PERMITS

The regional and local actions and permits that would be required for project implementation are listed below.

- **City of Sacramento:** Possible construction authorizations/encroachment permits.
- **Counties of Sacramento and Sutter:** Permits for compliance with the state's Surface Mining and Reclamation Act, and other possible construction authorizations/encroachment permits.
- **Feather River Air Quality Management District and Sacramento Metropolitan Air Quality Management District:** Authority to construct (for devices that emit air pollutants), permit to operate, and Air Quality Management Plan consistency determination.

1.8 PUBLIC INVOLVEMENT UNDER NEPA AND CEQA

1.8.1 NOTICE OF INTENT, NOTICE OF PREPARATION, AND SCOPING MEETING

USACE published a notice of intent (NOI) to prepare the American River Common Features GRR in the *Federal Register* (Vol. 73, No. 41) on February 29, 2008. A series of public scoping meetings were held in March 2008 to present information to the public and to receive public comments on the scope of the EIS. There is no mandated time limit to receive written comments in response to the NOI under NEPA. Because the Common Features/ Natomas PACR/Phase 4b Project is a component of the Common Features GRR, a separate NOI for the Common Features/Natomas PACR/Phase 4b Project does not need to be published.

On November 5, 2009, SAFCA filed a notice of preparation (NOP) for this EIS/EIR with the State Clearinghouse. In addition to the State Clearinghouse's distribution of the NOP to potentially interested state agencies, copies of the NOP were distributed to approximately 900 recipients, including Federal, state, regional, and local agencies; non-profit and private organizations; homeowners associations; partnerships; businesses; and individual residents in the project area to solicit input as to the scope and content of this EIS/EIR. Because the distribution list likely did not account for all affected parties in the Phase 4b Project footprint, USACE and SAFCA published a notice in *The Sacramento Bee* on November 5, 2009. The NOP was circulated for a 30-day public comment period, in accordance with the State CEQA Guidelines, which closed on December 4, 2009.

A joint NEPA/CEQA public scoping meeting was held on November 18, 2009 from 4:30 to 6:30 p.m. at the South Natomas Community Center in Sacramento, California, to brief interested parties on the Common Features/ Natomas PACR/Phase 4b Project and obtain the views of agency representatives and the public on the scope and content of this EIS/EIR.

1.8.2 DEIS/DEIR

The DEIS/DEIR was distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. The review period began on July 2, 2010 and closed on August 16, 2010.

Four public meetings were held during the review period. These meetings included the following:

- July 13, 2010 from 5:00 p.m. to 7:00 p.m. at the South Natomas Community Center located at 2921 Truxel Road, Sacramento, California;
- July 15, 2010 at 3:00 p.m. (as part of the SAFCA Board of Directors Meeting) at the Sacramento City Council Chambers located at 915 I Street, Sacramento, California;
- July 21, 2010 from 5:30 p.m. to 7:30 p.m. at the Sacramento County Administration Building Hearing Room 1located at 700 H Street, Sacramento, California; and
- August 4, 2010 from 5:00 p.m. to 6:30 p.m. at the Pleasant Grove School located at 3075 Howsley Road, Sacramento, California.

In addition, written comments from the public, reviewing agencies, and stakeholders were accepted throughout the public comment period. These comments, along with the written responses to those comments, are contained in **Appendix I**, "Responses to Comments on the DEIS/DEIR," of this FEIS/FEIR. Corrections, revisions, additions, and/or deletions to the text of the DEIS/DEIR are provided in **Appendix I**. Deleted text is shown in ~~strikeout~~ and added text is shown in underline. These text revisions are not shown in the FEIS/FEIR as changes; the FEIS/FEIR contains a clean reprint of the document.

1.8.3 NEXT STEPS IN THE ENVIRONMENTAL REVIEW PROCESS

This FEIS/FEIR will be distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. NEPA requires a 30-day public review for an FEIS, whereas CEQA requires a 10-day (for commenting agencies only) review for an FEIR. For this FEIS/FEIR, the NEPA and CEQA review periods will run concurrently, with the CEQA review period ending on day 10 and the NEPA review period ending on day 30.

After the CEQA review period, the SAFCA Board of Directors will consider certifying the EIR if it is determined to be in compliance with CEQA, and will rely on the certified EIR when considering project approval.

After the NEPA review period, USACE will consider the Phase 4b Project and issue its ROD. The ROD will identify USACE's decision regarding the alternatives considered, address substantive comments received on the FEIS, and determine whether the Adjacent Levee Alternative (Proposed Action) complies with Sections 408, 404, and 10.

1.9 ORGANIZATION OF THIS EIS/EIR

The content and format of this EIS/EIR are designed to meet the requirements of NEPA, as set forth by the CEQ and USACE's NEPA policy and guidance, including Appendix B, "NEPA Implementation Procedures for the Regulatory Program," appended to 33 CFR Part 325, "Processing of Department of Army Permits;" and CEQA and the State CEQA Guidelines. The EIS/EIR is organized as follows:

- The Abstract identifies the project title, lead agencies, an abstract, and comment submission information.
- The Executive Summary summarizes the purpose and intended uses of the EIS/EIR, lead agencies, project location, project background and phasing, need for action, and project purpose/objectives; presents an overview of the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration as well as the major conclusions of the environmental analysis; documents the known areas of controversy and issues to be resolved; and ends with a summary table that lists the environmental impacts, mitigation measures, and significance conclusions for the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration.
- Chapter 1, "Introduction and Statement of Purpose and Need," explains the NEPA and CEQA processes; lists the lead, cooperating, responsible, and trustee agencies that may have discretionary authority over the project, including non-Federal sponsors; specifies the underlying project purpose/objectives and need for action, to which the lead agencies are responding in considering the proposed project and project alternatives; summarizes required permits, approvals, and authorizations; outlines the organization of the document; and provides information on public participation.
- Chapter 2, "Alternatives," presents the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration. This chapter constitutes the project description and describes the project components for each action alternative as well as the No-Action Alternative. This chapter also describes alternatives incorporated by reference and alternatives considered but eliminated from further consideration; and provides a summary matrix that compares the environmental consequences of the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration.
- Chapter 3, "Affected Environment," is divided into 16 sections. Each of the sections is devoted to a particular issue area and describes the baseline or existing environmental and regulatory conditions.
- Chapter 4, "Environmental Consequences and Mitigation Measures," provides an analysis of impacts at an equal level of detail for the Adjacent Levee Alternative (Proposed Action) and alternatives under

consideration, and identifies mitigation measures that would avoid or eliminate significant impacts or reduce them to a less-than-significant level, where feasible.

- Chapter 5, "Cumulative and Growth-Inducing Impacts and Other Statutory Requirements," provides a summary of and incorporates by reference the analyses of cumulative impacts contained in previous environmental documents completed for the NLIP. The "Cumulative Impacts" section also includes any new cumulative impacts; the cumulative impacts of the potential construction of multiple project phases simultaneously; and the Phase 4b Project contribution to cumulative impacts from implementation of the Phase 4b Project. The "Growth-Inducing" impacts section provides a summary of and incorporates by reference the analysis of growth-inducing impacts contained in previous environmental documents completed for the NLIP. The remainder of this chapter includes the following requirements of NEPA and CEQA that are not addressed elsewhere in this EIS/EIR: relationship between short-term uses of the environment and long-term productivity, significant and unavoidable environmental impacts, and irreversible and irretrievable commitments of resources.

- Chapter 6, "Compliance with Federal Environmental Laws and Regulations," summarizes the Federal laws and regulations that apply to the project and describes the project's compliance with them.

- Chapter 7, "Consultation and Coordination," summarizes public involvement activities under NEPA and CEQA; Native American consultation; and coordination and with other Federal, state, regional, and local agencies. A list of organizations and individuals receiving a copy and/or notice of this EIS/EIR is also included.

- Chapter 8, "References," provides a bibliography of sources cited in this EIS/EIR.

- Chapter 9, "List of Preparers," lists individuals who were involved in preparing this EIS/EIR.

- Chapter 10, "Index," contains the NEPA-required index for easy reference of topics and issues.

- Appendices contain background information that supports this EIS/EIR and can be found (with the exception of Appendix I, which immediately follows the main body of this FEIS/FEIR) on the CD located in the back cover of this EIS/EIR.

1.10 RELATED NEPA DOCUMENTS AND DOCUMENTS RELIED ON IN PREPARATION OF THIS EIS/EIR

The following NEPA documents, previously prepared by USACE, were reviewed by USACE staff in the analysis of the project:

- April 1991, *Draft American River Watershed Investigation California Feasibility Report: Part I—Main Report* and *Part II—Draft Environmental Impact Statement/Environmental Impact Report*;

- December 1991, *American River Watershed Investigation (AWRI) California Feasibility Report (FR): Part I—Main Report* and *Part II—Environmental Impact Statement/Environmental Impact Report*;

- December 1991, AWRI FR, Volume 2, Appendix G: Section 404 Evaluation;

- March 1996, *Supplemental Information Report, American River Watershed Project, California: Part I—Main Report* and *Part II—Final Supplemental Environmental Impact Statement (FSEIS)/Environmental Impact Report*;

- June 27, 1996, Chief's Report on FSEIS, signed by Acting Chief of Engineers, Major General Pat M. Stevens; and
- July 1, 1997, ROD on FSEIS, signed by Director of Civil Works, Major General Russell L. Furman.

The authors of this EIS/EIR have relied on several background documents in reaching many of the conclusions in this EIS/EIR. These documents provide background information, are sources of technical information, or are part of the planning context for the overall program. Some of these documents form the foundation of the technical analysis conducted in this EIS/EIR. These documents are as follows:

- *Sacramento Area Flood Control Agency, Natomas Levee Improvement Program, Summary Report on Hydraulic Impact Analyses, Phase 4b Project* (**Appendix C1**);
- *Evaluation of Potential Groundwater Impacts Due to Proposed Construction for Natomas Levee Improvement Program* (**Appendix C2**);
- Evaluation of Cutoff Walls' Impact on Groundwater Recharge (**Appendix C3**);
- Potential Impacts of Phase 4b Project Slurry Cutoff Walls (**Appendix C4**);
- Natomas East Main Drainage Canal Erosion Protection Design (**Appendix C5**);
- Draft Pleasant Grove Creek Canal Erosion Analysis (**Appendix C5**);
- Programmatic Biological Opinion issued by USFWS on the Natomas Levee Improvement Program, Landside Improvements Project (October 2008); Amendment (May 2009); and Appendage (September 2009) (**Appendix D1**);
- California Endangered Species Act Section 2081 (b) Incidental Take Permit, Natomas Levee Improvement Program Landside Improvements Project (May 2009);
- Final NLIP Landside Improvements Project Programmatic Long-Term Management Plan (April 2009);
- Wetland delineation verification letters from USACE (**Appendix D2**); and
- *Natomas Levee Improvement Program Initial Site Survey and Phase I Environmental Site Assessment, Volumes 8 and 13.*

Additional reference documents used to prepare this EIS/EIR are listed in Chapter 8, "References."

2 ALTERNATIVES

2.1 INTRODUCTION

As noted in Chapter 1, "Introduction and Statement of Purpose and Need," this EIS/EIR has been prepared to evaluate the potential environmental impacts of the Phase 4b Project, and will be submitted to Congress in late 2010 to support approval of USACE's American River Watershed Common Features Project/Natomas Post-authorization Change Report (Common Features/Natomas PACR), which is an element of the American River Watershed Common Features Project General Re-evaluation Report (Common Features GRR). The Common Features/Natomas PACR includes all four project phases (1, 2, 3, and 4a, and 4b) of the Landside Improvements Project, which is a component of the Natomas Levee Improvement Program (NLIP). These project phases are summarized in Section 1.5, "Environmental Regulatory Framework and Relationship of this EIS/EIR to Other Documents." This EIS/EIR summarizes prior environmental analyses for all previously approved project phases, as well as previously released public draft documents of the Landside Improvements Project, and evaluates in detail the environmental effects of the proposed Phase 4b Project. This information will then become part of the overall request for Congressional review and approval of the Common Features/Natomas PACR.

This EIS/EIR evaluates the potential project-level impacts on the environment from implementation of the Phase 4b Project (Proposed Action/Proposed Project), hereinafter referred to in this chapter as "the project." This chapter describes the alternatives that were considered to provide additional flood risk reduction to the Natomas Basin consistent with the objectives in Chapter 1, "Introduction and Statement of Purpose and Need." The Phase 4b Project builds upon a program of improvements analyzed in previous environmental documents for achieving flood risk damage reduction for the 53,000-acre Natomas Basin, which is encircled by 42 miles of levees (**Plate 1-1**). Although they provide contrasting advantages and disadvantages, each of the action alternatives is considered feasible for the purpose of analysis based on relevant economic, environmental, social, technological, and legal factors. Three alternatives are evaluated at an equal level of detail in this EIS/EIR:

- No-Action Alternative,
- Adjacent Levee Alternative (Proposed Action), and
- Fix-in-Place Alternative.

These alternatives represent a reasonable range of alternatives, consistent with the requirements of NEPA and CEQA and when considered in the context of prior alternatives analyses described in previous environmental documents and which are incorporated by reference in this EIS/EIR (see **Appendix B1**). The action alternatives under consideration have been formulated to feasibly accomplish the primary objectives of the project as discussed in Chapter 1, "Introduction and Statement of Purpose and Need," of this EIS/EIR, which includes reducing the risk of flooding to the Natomas Basin. The action alternatives include components that could avoid or substantially lessen one or more of the project's significant effects.

2.1.1 NEPA/CEQA REQUIREMENTS FOR EVALUATION OF ALTERNATIVES

2.1.1.1 NEPA REQUIREMENTS

The NEPA Council on Environmental Quality Regulations (40 Code of Federal Regulations [CFR] Section 15012.14) require that an EIS include:

- an objective evaluation of reasonable alternatives;

- identification of the alternatives considered but eliminated from detailed study, along with a brief discussion of the reasons that these alternatives were eliminated;

- information that would allow reviewers to evaluate the comparative merits of the proposed action (i.e., proposed project) and alternatives;
- consideration of the no-action alternative;
- identification of the agency's preferred alternative, if any; and
- appropriate mitigation measures not already included in the proposed action or alternatives.

NEPA requires the analysis of the proposed action and of all alternatives at a substantially similar level of detail. The Council on Environmental Quality Regulations (40 CFR Section 1502.14) require agencies to rigorously explore and objectively evaluate all reasonable alternatives and to devote substantial treatment to each alternative considered, including the proposed action. All alternatives considered, including the preferred alternative, must be evaluated compared to the No-Action Alternative (future without project).

2.1.1.2 CEQA Requirements

The California Code of Regulations (CCR) Section 15126.6(a) of the State CEQA Guidelines requires that an EIR:

(1) describe a range of reasonable alternatives to a proposed project, or to the location of the project, that would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project; and

(2) evaluate the comparative merits of the alternatives.

An EIR need not consider every conceivable alternative to a proposed project, but must consider a range of reasonable, potentially feasible alternatives that will foster informed decision making and public participation.

The range of alternatives required to be evaluated in an EIR is governed by a "rule of reason" that requires the EIR to consider only those alternatives necessary to permit a reasoned choice. The EIR need examine in detail only those alternatives that the lead agency determines could feasibly attain most of the basic project objectives, taking into account factors that include site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site (State CEQA Guidelines CCR Section 15126.6[f]). CEQA does not require the alternatives to be evaluated at the same level of detail as the proposed project.

The State CEQA Guidelines recommend that an EIR should briefly describe the rationale for selecting the alternatives to be discussed, identify any alternatives that were considered by the lead agency but were eliminated as infeasible, and briefly explain the reasons underlying the lead agency's determination (State CEQA Guidelines CCR Section 15126.6[e]).

An EIR must also evaluate a "no-project" alternative, which represents "what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (State CEQA Guidelines CCR Section 15126.6[e][2]). Under CEQA, the no-project alternative, like all of the alternatives, is compared to the proposed project.

2.1.2 ALTERNATIVES SCREENING

USACE and SAFCA formulated the project and a reasonable range of alternatives that would achieve the specific project objectives through the following steps:

- identification of the deficiencies in the Natomas levee system that must be addressed to provide at least 100-year (0.01 annual exceedance probability [AEP]) flood risk reduction as quickly as possible;
- identification of the deficiencies in the Natomas levee system that must be addressed to provide 200-year (0.005 AEP) flood risk reduction,
- identification of feasible remedial measures to address the deficiencies,
- determination of the likely environmental impacts of the remedial measures,
- development of a reasonable range of flood damage reduction alternatives for implementing the remedial measures; and
- identification of measures to ensure that each alternative would improve aviation safety, minimize impacts on significant cultural resource sites, and enhance habitat values.

Alternatives screening for the overall NLIP has been undertaken in a systematic manner through several environmental documents as summarized in this chapter and detailed in **Appendix B1**. A description of the flood risk reduction measures that SAFCA considered for developing alternatives is provided below.

2.1.3 TYPES OF FLOOD RISK REDUCTION MEASURES CONSIDERED

Designing effective flood risk reduction measures is an iterative process that involves identifying, evaluating, and comparing measures and preliminary alternatives to develop a reasonable range of final alternative plans for consideration by decision makers and the general public. For the NLIP Landside Improvements Project, engineering measures were developed and considered that alone or in various combinations would address the project objectives.

The engineering measures that were considered for the Phase 4b Project must meet several criteria. The design selected must adequately improve performance of the levee so that Federal Emergency Management Agency (FEMA) certification is possible. Generally, the requirements are to provide a sufficient height of levee raise **(Plate 1-3)** so that the levee height is adequate, levee stability meets levee design criteria, and/or seepage through or beneath the levee is reduced to levels acceptable to USACE. Measures considered are described below.

2.1.3.1 LEVEE IMPROVEMENTS

USACE has divided the flood damage reduction improvements within the Natomas Basin into nine reaches (Reaches A–I), as shown on **Plate 1-3**. USACE's reach designations differ from SAFCA's reach designations, which are more finely subdivided than the USACE system for the Sacramento River east levee, American River north levee, and the NCC. In **Plate 1-3**, lettered reaches follow the USACE designation, while numbered reaches follow the SAFCA designations:

- Sacramento River east levee: Reach A:16–20
- Sacramento River east levee: Reach B:5A–15
- Sacramento River east levee: Reach C:1–4B
- NCC: Reach D:1–7
- PGCC: Reach E: there are no SAFCA reaches, just station numbers

- NEMDC North: Reaches F–G
- NEMDC South: Reach H
- American River north levee: Reach I:1–4

Sacramento River East Levee (Reach A:16–20)

The existing levee in Sacramento River east levee Reach A:16–20 currently meets height requirements, and, therefore, no levee raise is necessary in this reach. However, the levee needs to be upgraded to meet USACE requirements regarding seepage through the levee and its foundation, slope stability, and free access for inspection, maintenance, and emergency flood fighting. Two engineering options were analyzed for the levee upgrade: the Fix-in-Place Method and the Adjacent Levee Method. Because these options have potentially different effects on the environment, they are analyzed as the two action alternatives in this EIS/EIR (see Sections 2.3, "Proposed Action," and 2.4, "Fix-in-Place Alternative"):

- **Fix-in-Place Method.** Most levee reaches in the Natomas Basin have a 2-to-1 horizontal-to-vertical (2H:1V) landside slope, which may not meet criteria for slope stability or access on the levee for maintenance and operation. This condition is found on Sacramento River east levee Reach A:16–20, which is a component of the Phase 4b Project. Using the Fix-in-Place method, the remedy would be to flatten the slope to a minimum 3-to-1 horizontal-to-vertical (3H:1V) landside slope by adding fill on top of the existing landside levee slope, thereby widening the base of the levee prism but not expanding the width of the levee crown (**Plate 2-1**, upper illustration). The Fix-in-Place method is compatible with the seepage remediation methods described under Section 2.1.3.2. By leaving the levee prism in the current alignment, this method requires vegetation clearance on the waterside of the levee to comply with USACE levee guidance that requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes (USACE 2000). However, in reaches where the existing levee is already wide enough that the levee prism is considered clear of vegetation, such as in American River north levee Reach I:1–4, the Fix-in-Place method may be used to reduce the theoretical levee footprint to avoid encroachments on the landside.

  While the levee footprint (its base) size may not be substantially altered, mitigation for loss of habitat would be required by various regulatory agencies. Where the widening results in filling waters of the United States, including wetlands, mitigation would be required, generally at a 1:1 replacement ratio. Where the widening occurs on the landside or waterside and trees that provide habitat or are otherwise protected exist, the mitigation requirement is to plant replacement woodlands and/or shaded riverine aquatic (SRA) habitat. In some instances, irrigation and drainage ditches and canals exist at the toe of the levee, and would require relocation to ensure USACE's seepage and stability criteria are met. Widening of the existing levee may require the purchase of additional easements and/or rights-of-way, including areas for utilities and planting/replacement woodlands and other habitats. Proper construction of the widened levee may require excavation of a keyway trench in the foundation area at the toe of the levee.

- **Adjacent Levee Method.** This method combines slope flattening to 3H:1V with a widening of the existing levee crown by 15 to 20 feet on the landside. The concept of an adjacent levee is that the levee prism would be shifted landward (as shown in **Plate 2-1**, lower illustration), such that much of the vegetation on the waterside of the existing levee would be less likely to need to be cleared for levee operation and maintenance (see Section 2.1.3.4, "Management of Levee Vegetation and Structural Encroachments," below). This design potentially reduces the need to remove vegetation on the waterside to meet USACE vegetation guidance criteria. The irrigation and drainage ditches and canals that exist at the toe of the levee may require relocation farther to the landside. Construction of an adjacent levee may also require the purchase of additional easements and/or rights-of-way, including areas for utilities and planting of replacement woodlands and other habitats. Proper construction of the adjacent levee foundation often requires excavation of an inspection trench in the foundation soils. Because the Natomas Basin's natural levees have been augmented by human efforts, it is possible to find buried prehistoric features at considerable depth in the landside footprint.

Raised adjacent levees have been constructed or are in the approval process for Sacramento River east levee Reach C:1 to part way through Reach B:13 (Phase 2, 3, and 4a Projects). From the remainder of Sacramento River east levee Reach B:12 to Reach A:20 (Phase 4a and 4b Projects), the existing levee has sufficient height, and the proposed adjacent levee would be at the same height as the existing levee. The Phase 2, 3, and 4a Projects are summarized in Section 4.18, "Summary of Environmental Impacts and Mitigation Measures from Previous Natomas Levee Improvement Program Phase 1–4a Landside Improvements Projects."

Pleasant Grove Creek Canal and Natomas East Main Drainage Canal West Levee (North of Natomas East Main Drainage Canal Stormwater Pumping Station)

Two engineering options are also available for reaches where levee raising is required to meet the level of risk reduction required by the State for urbanized areas, such as the Natomas Basin. In the Phase 4b Project, these raises are proposed for the west levees of the Pleasant Grove Creek Canal (PGCC) (Reach E) and the Natomas East Main Drainage Canal (NEMDC) North (Reaches F–G). These options have similar environmental effects, and they are analyzed as part of both the Adjacent Levee Alternative (Proposed Action) (Section 2.3) and Fix-in-Place Alternative (Section 2.4):

- **Raise-in-Place Method.** Raising the levee in place would require the existing levee footprint to be widened at its base on one or both sides. This method may require replacement of public roadways that may be located on the crown of the levee. Although the levee footprint (its base) size may not be substantially altered, mitigation for loss of habitat would be required by various regulatory agencies. In some instances, irrigation and drainage ditches and canals exist at the toe of the levee, and would require relocation. Widening of the existing levee may require the purchase of additional easements and/or rights-of-way, including areas for utilities and planting/replacement woodlands and other habitats. Proper construction of the widened levee may require excavation of a keyway trench in the foundation area at the toe of the levee.

- **Adjacent Levee Raise Method.** In lieu of modifying the existing levee, a levee raise may also be achieved by constructing a new landside embankment adjoining the existing levee. This approach, which is similar to the adjacent levee method described above, allows sufficient levee height to be achieved without degrading the existing levee and rebuilding public roadways that may be located on top of the existing levee. However, it requires excavation of additional suitable material to build the adjacent structure. The irrigation and drainage ditches and canals that exist at the toe of the levee may require relocation farther to the landside. Construction of an adjacent levee may also require the purchase of additional easements and/or rights-of-way, including areas for utilities and planting of replacement woodlands and other habitats. Because the west levees of the PGCC and NEMDC, north of the NEMDC Stormwater Pumping Station, already substantially comply with levee vegetation guidance criteria, the adjacent levee is not needed as an option to avoid vegetation removal on the waterside (see 2.1.3.4, "Management of Levee Vegetation and Structural Encroachments," below).

2.1.3.2 SEEPAGE REMEDIATION

Pre-NLIP existing seepage remediation in the Natomas Basin has primarily addressed seepage through the levee embankment (through-seepage). Through-seepage occurs when the waterside slope is loaded by high river stage for a sufficient time to develop a steady state condition in the levee embankment in which water is seeping on the levee landside slope, removing material from the levee embankment by internal erosion and leading to slope instability. Through-seepage is the movement of water through the levee itself, when high-flow conditions, and/or wind and wave action exist on the waterside of the levee. Through-seepage may be addressed by construction of cutoff walls through the levee prism or drained stability berms on the landside slope. The cutoff walls provide a low-permeability barrier to water flow through the levee. Drained stability berms prevent levee material from being removed, drains the seepage water away from the levee, and also increases the stability of the levee slope. Underseepage or seepage through the levee foundation occurs during prolonged high river stages and results in high gradients at the levee landside toe due to build-up of the water pore pressure in the levee foundation to a high limit which may lead to levee collapse due to piping (removal of material from the levee foundation through sand

boils (**Plate 1-4**) or slope instability due to high water pore pressures in the foundation soils. Excessive underseepage gradients can be addressed by cutoff walls, seepage berms, and relief wells, or using a combination of these measures, which are discussed below.

Cutoff Walls

Cutoff walls use specialized earthen materials (often bentonite clay) constructed in the levee embankment, which extend into the levee foundation to a sufficient depth to reduce the seepage gradient at the landside toe of the levee below an allowable limit. Specialized equipment allows the cutoff walls to reach deep into the subsurface, to depths of 120 feet (**Plate 2-2**). Often the levee crown is "degraded," meaning that the levee embankment is excavated to create a wide working platform for the construction equipment to install the cutoff wall. A fully penetrating cutoff wall installed deep enough to reach a lower impervious layer in the foundation may reduce the seepage gradient to a very low limit. A partially penetrating wall, which does not reach the lower impervious strata in the foundation, may reduce the seepage gradient by increasing the seepage path, but sometimes the reduction is not sufficient to drop the gradient below the maximum allowable limit and an additional seepage berm or relief well is required. Fully penetrating cutoff walls are generally preferred, if it is constructible, because they are the least costly (particularly if a soil-bentonite [SB] mix is used and the depth of wall is less than 85 feet); are the most reliable under uncertain hydraulic and geotechnical conditions (e.g., water surface elevations above design and variations in foundation soil conditions); and, when combined with an adjacent levee, minimize construction disturbance outside the levee footprint.

If a fully penetrating wall is not feasible due to the foundation conditions (the lower impervious layer is non-existent or at a depth not possible to be reached with the existing equipment), then partially penetrating walls eventually supplemented with additional methods of seepage mitigation (such as seepage berms or relief well) may be used. Eventually, partially penetrating walls may be completely replaced by seepage berms or relief wells.

Seepage Berms

Seepage berms are wide, shallow features with relatively flat surface slopes graded to drain landward. They are typically constructed using material excavated from borrow sites. The berms may be constructed of any impervious material from the borrow sites or, to increase the berms efficiency and decrease the berm width, the random berm material may be placed on a free drainage layer 2–2.5 feet thick placed on a 6 inches of filter material to prevent removal of the fine foundation material by piping. Seepage berms may extend between a minimum of 80 feet to up to 500 feet landside of the toe of the levee or the adjacent levee (**Plate 2-3**). In areas of limited space, seepage berms are supplemented with relief wells at the landside toe of the seepage berms.

Constructing seepage berms rather than cutoff walls avoids the deep ground-disturbing work that may adversely affect cultural resources that may be present, while still achieving flood damage reduction objectives. It is possible to construct a seepage berm using specialized equipment that minimizes vibration and pressure on the immediate subsurface environment. This construction method is often used where sensitive historical features may be expected near the ground surface, and relief wells are omitted. A seepage berm without relief wells extends the levee footprint farther landside and depending upon adjacent land use, may require relocation of permanent structures or take affected agricultural land out of production, as well as other environmental impacts.

Relief Wells

Relief wells are controlled artificial springs that relieve the confined water pressures to safe values. This reduces the potential for the removal of soil via piping or internal erosion caused by the uplift pressures beneath elements of the levee or beneath landward soil next to the levee. Relief wells are usually spaced about 50–150 feet apart to decrease the gradients at the levee toe below the maximum allowable gradient between two adjacent wells and allow water to flow without pumping during times of high water table. Piezometers are used as a tool to verify relief well performance by measuring the hydrostatic pressure between the wells. Because relief wells may only flow on an intermittent basis, sometimes several years apart, it is necessary to conduct regular maintenance of

relief wells to ensure that they perform properly (**Plate 2-4**). Relief wells also require collection of water flowing through the wells during high river stages, which is then discharged back into the river through a pumping station. This may require excavation of a ditch along the landside toe of the levee or seepage berm or collecting the water through an underground piping system.

2.1.3.3 BANK EROSION CONTROL

Bank erosion poses either a high or moderate risk to the stability of the Sacramento River east levee at several locations upstream and downstream of Interstate 5 (I-5) where river flows and waves generated by boat wakes have weakened and undercut portions of the bank supporting the levee. The adjacent levee design would address the potential instability created by these bank erosion processes by enlarging the levee section and moving the levee foundation landward away from the eroding bank. These bank erosion processes could also be addressed by installing rock revetments or other engineered structures along the eroding banks so as to reduce further erosion and protect the foundation of the levee (as proposed for the NEMDC South; see Section 2.3.3.2, "Sacramento River East Levee," under "Pleasant Grove Creek Canal and Natomas East Main Drainage Canal – South Waterside Improvements").

2.1.3.4 MANAGEMENT OF LEVEE VEGETATION AND STRUCTURAL ENCROACHMENTS

USACE levee guidance requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes (USACE 2000). USACE levee guidance also requires an assessment of encroachments on the levee slopes, including utilities, fences, structures, retaining walls, driveways, and other features that penetrate the levee prism (see Section 2.3.4.11, "Structural Encroachments"). Substantial encroachments are present on the Sacramento River east levee with a smaller number of encroachments on the other Natomas levees.

Vegetation Variance Request

During preparation of the DEIS/DEIR, SAFCA and the Central Valley Flood Protection Board (CVFPB), the non-Federal sponsors of the NLIP, requested a variance from the standard vegetation guidelines set forth in USACE's Engineering Technical Letter 1110-2-571 (USACE 2009a). The *CVFPB and SAFCA Vegetation Variance for the Common Features (Natomas Basin) Project, Post-Authorization Change Report* (also referred herein as "vegetation variance") was developed to comply with applicable provisions of the California Central Valley Flood System Improvement Framework that was adopted by the California Levees Roundtable on March 26, 2009 (Framework). The Framework specifically states that where, as in the case of the Phase 4b Project, major modifications of existing levee sections are required, such modifications:

> ...will comply with the [USACE] levee vegetation standards, but may allow vegetation to remain if these projects can demonstrate that the public safety risks posed to levee integrity have been adequately addressed and engineered into project designs.

The Framework is to be used as a guide for vegetation on levees until the Central Valley Flood Protection Plan is completed in 2012.

The vegetation variance request was granted by USACE in June 2010, and vegetation will be allowed to remain on a portion of the waterside slope and berm of several of the levee segments comprising the perimeter levee system protecting the Natomas Basin, except the lower 1/3 of the slope of the NEMDC where trees must be removed to comply with USACE levee vegetation guidance. Although the variance was granted, this FEIS/FEIR retains the original scenarios presented in the DEIS/DEIR, which include both a with- and without-variance outcome to show the full range of potential adverse effects, including the worst-case scenario, as required under NEPA. The following sections describe the levee segments that are covered by this variance. Sections 2.3,

"Proposed Action," and 2.4, "Fix-in-Place Alternative," describe the vegetation removal assumptions used by this EIS/EIR to provide environmental analysis to support consideration of this variance request.

Adjacent Levees

One of the objectives of constructing an adjacent levee along the Sacramento River east levee is to facilitate acceptable management of existing vegetation and structural encroachments along the waterside of this levee. By making the levee wider and effectively moving the "designated levee" section landward (**Plate 2-1**, lower illustration), the separation between waterside vegetation and the levee prism would be increased, thus reducing the conflicts between applicable USACE levee operation and maintenance requirements, and waterside vegetation and structural encroachments. Because this design would allow vegetation to remain on the waterside under the proposed variance, valuable riparian habitat would be preserved, benefiting several special-status species. This riparian habitat, which is shown on **Plates 3-4c** and **3-4d**, also provides a migration corridor habitat for a variety of wildlife species that inhabit the Natomas Basin.

Section 2.3.4.10, "Vegetation Management," provides additional information on the relationship of the Adjacent Levee Alternative (Proposed Action) with management of levee vegetation. Construction of the adjacent levee would also involve removal of vegetation within 15 feet of the landside toe of the widened levee. The adjacent levee has been constructed and/or approved for Sacramento River east levee Reaches C:1–4B and B:5A–15 as part of the Phase 2 and 3 Projects.

Other segments of the Natomas Basin perimeter levee system may already be in compliance with levee vegetation guidance criteria or may qualify for a variance within the next several years because: (1) vegetation did not exist or has already been cleared within the 15-foot clearance zone; (2) these segments were previously overbuilt to the point where their levee prism could be considered clear of waterside or landside vegetation and would potentially qualify for a variance; or (3) planned improvements would ensure compliance through waterside slope flattening, shifting levee crowns in a landward direction, and removing any vegetation that would penetrate the levee prism. Levee segments falling into this category include most of the Natomas Cross Canal (NCC) south levee (Reach D:1–7), the PGCC west levee (Reach E), and the west levee of the NEMDC north of the NEMDC Stormwater Pumping Station (Reaches F–G).

Overbuilt Levees

An overbuilt levee is defined as a levee with land and waterside slopes of at least 3H:1V and a virtual levee crown (measured at the design water surface elevation) that is at least 35-feet wide (designated levee crown). Similar to the adjacent levee, the overbuilt levee allows for considering that the levee prism meets the criteria of having a 15-foot vegetation free zone from the projected waterside toe, such that much of the vegetation on the waterside of the existing levee is less likely to need to be cleared for levee operation and maintenance. Like the adjacent levee, to be in compliance, trees would not be allowed to remain within the area extending 15 feet landward from the toe of the overbuilt levee out to 15 feet from the toe of the projected waterside slope.

The American River north levee is an extension of the Sacramento River east levee that extends from I-5 to Northgate Boulevard, where it becomes the west levee of NEMDC South. This segment of the Natomas perimeter levee system is considered an overbuilt levee and may qualify for a variance from USACE levee vegetation guidance because it was widened beyond standard levee dimensions to support the Arden-Garden Connector transportation project. Also considered overbuilt and potentially eligible for a variance is the segment of the west levee of NEMDC South that extends from Northgate Boulevard to the Arden-Garden Connector. Although these levee segments are overbuilt to the extent that they may not need vegetation clearance on the waterside if a variance is granted, on the landside an extensive number of trees would be removed to accommodate the expanded levee footprint, including removal of vegetation within 15 feet of the new landside levee toe.

Non-Conforming Levees

The lower portion of the NEMDC west levee from the NEMDC Stormwater Pumping Station to Northgate Boulevard presents more challenging vegetation management options. This portion of the levee system was raised and strengthened by SAFCA in 1995–1996 as part of the American River Watershed Project authorized by Congress in the 1993 Defense Appropriations Act. The authorized project called for raising the levee to protect the Natomas Basin from the combined effects of high flows in the American River channel and high flows in Dry Creek and Arcade Creek, the tributary streams that drain foothill watersheds east of Natomas. SAFCA widened the existing levee section to the landside and raised the levee by two to three feet. Urban development along the landside of the levee constrained the space available for the project and the improved levee was designed and constructed with a 2:1 landside slope.

Project construction required landside tree removal to accommodate the widened footprint of the improved levee. However, with the concurrence of USACE and the State, to minimize the project's environmental effects, trees were allowed to remain in the maintenance area along the landside toe of the improved levee and along the waterside slope of the levee and waterside berm. It was felt that these trees would not impair the performance of the improved levee because there was adequate visibility of and access to both sides of the levee to conduct routine maintenance and flood fighting activities. Nor was there any significant concern regarding the impact of the remaining trees on the safety or structural integrity of the improved levee. Although nearly overtopped and subjected to prolonged high flow during the flood of 1986, the old levee had performed well with few signs of stress. With its increased height, the new levee performed even better during the flood of 1997. However, this levee is no longer considered in compliance with USACE levee vegetation guidance, and avoidance of landside tree clearing in this maintenance area would require a variance from USACE.

The Phase 3 Project analyzed the installation of cutoff walls through portions of the NEMDC west levee where it crosses the old streambeds of Dry Creek, Arcade Creek and Magpie Creek. The Phase 4b Project proposes construction of cutoff walls along the entire length of the NEMDC and PGCC west levee. Installation of these cutoff walls would address the risk of destabilizing underseepage in these locations which occupy approximately one-half the length of the levee between the NEMDC Stormwater Pumping Station and Northgate Boulevard. This risk was not considered to be substantial when the improvements described above were designed and constructed. Insofar as vegetation on or near the improved levee has also now been identified as a risk factor, removal would be required for all non-native trees from within the vegetation-free zone; all native trees that have a diameter at breast height (dbh) of four inches or less; and all larger native trees that are located on the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet) (see 2.2.1.1, "No Phase 4b Project Construction"). Under a variance request, vegetation within 15 feet of the toe of the waterside slope of the west levee along NEMDC South would be allowed to remain.

Life Cycle Management Program

The following five risk factors are associated with levee vegetation:

- access (trees could obstruct access for routine maintenance and flood fighting);
- visibility (trees could impair routine levee inspection and high water condition monitoring);
- slope stability (trees could contribute to slope instability);
- seepage (tree roots could create seepage pathways); and
- windthrow (overturned trees could create destabilizing slip planes).

For non-conforming levees that may be granted a variance, implementation of a Life Cycle Management (LCM) program would use GIS- and field-based evaluation tools to ensure that new trees would not become established in the vegetation-free zone, and trees allowed to remain in this zone would be carefully monitored, trimmed and, if necessary, removed if they become an unacceptable risk to the performance of the levee due to age or infirmity.

2.1.4 ALTERNATIVES CONSIDERED IN PREVIOUS ENVIRONMENTAL ANALYSES AND INCORPORATED BY REFERENCE

The analyses of alternatives performed in the previous environmental documents from which this EIS/EIR is tiered, which are listed below, are summarized in **Appendix B1**. The alternatives analyses from these documents are incorporated by reference, herein. The material summarized in **Appendix B1** is provided to summarize the scope of analysis that has already been performed and thus shows which alternatives have been eliminated from further analysis or rejected by previous agency decisions.

The alternatives analyses incorporated herein by reference are from the following environmental documents:

- *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area*, State Clearinghouse No. 2006072098 (Local Funding EIR) (SAFCA 2007a);
- *Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR) (SAFCA 2007b);
- *Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project* (Phase 2 EIS) (USACE 2008);
- *Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project—Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 SEIR) (SAFCA 2009a);
- *Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project – Phase 2 Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR 1st Addendum) (SAFCA 2009c);
- *2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project – Phase 2 Project,* State Clearinghouse No. 2007062016 (Phase 2 EIR 2nd Addendum) (SAFCA 2009d);
- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIS and EIR) (USACE 2009b and SAFCA 2009b);
- *Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIR Addendum) (SAFCA 2009e); and
- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project*, State Clearinghouse No. 2009032097 (Phase 4a EIS and EIR) (USACE 2010 and SAFCA 2009f).

Relevant portions of these documents, where specifically noted, are summarized throughout this EIS/EIR. Printed copies of these documents are available to the public at USACE's office at 1325 J Street, Sacramento, California and at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California, during normal business hours, and are also available on USACE's Web site, at http://www.spk.usace.army.mil and at SAFCA's Web site, at http://www.safca.org/Programs_Natomas.html.

2.1.5 ALTERNATIVES CONSIDERED, BUT ELIMINATED FROM FURTHER CONSIDERATION

Numerous alternatives have been considered by USACE and SAFCA to reduce flood risk in the Natomas Basin. These alternatives were evaluated and eliminated from further consideration during completion of previous environmental documents. This section briefly summarizes alternatives considered but eliminated in these documents. More detailed information on alternatives considered but eliminated is provided in **Appendix B1**.

The following alternatives were reviewed and eliminated from further consideration as described below:

- **Yolo Bypass Improvements.** This measure would involve lengthening the Fremont Weir and widening the Yolo Bypass to increase the amount of flood water conveyed through the bypass and reduce the amount of flood water conveyed through the Sacramento River channel downstream of the weir. This alternative was eliminated because: (1) it would be too costly for SAFCA to implement; (2) levee height increases and substantial seepage and slope stability remediation would still be required for the Natomas perimeter levee system, adding to costs; (3) these improvements lie outside of SAFCA's jurisdiction and would require Federal, State, and local cooperation and funding; and (4) the project objective of restoring 100-year (0.01 AEP) design flood levels to the Natomas Basin could not be achieved as quickly as possible. (Considered and eliminated in Phase 2 EIS.)

- **Reduced Natomas Urban Levee Perimeter.** This measure would involve construction of a cross levee running east to west across the Natomas Basin along an alignment north of Elkhorn Boulevard to protect existing developed areas in the City and County of Sacramento. This alternative was eliminated because: (1) it is inconsistent with current Federal and State authorizations and would strand Federal, State, and local investments already made in improving the NCC south levee and Sacramento River east levee pursuant to past Congressional authorization; (2) it would result in the need to raise State Route (SR) 99 or otherwise protect SR 99 from flooding; (3) it would divide Reclamation District (RD) 1000 and disrupt several portions of the Natomas Basin irrigation and drainage system and require reconfiguration of these systems; (4) it would present significant barriers to achieving the goals of the *Natomas Basin Habitat Conservation Plan* (NBHCP); (5) it would have substantially greater costs than other alternatives without achieving any additional flood damage reduction benefit; and (6) it would leave a portion of the Basin currently planned for development by Sutter County (i.e., *Sutter Pointe Specific Plan* mixed-use development project) outside the urban levee perimeter and likely cause Sutter County to exercise its rights under SAFCA's joint exercise of powers agreement to prevent the expenditure of Consolidated Capital Assessment District funds on this measure. (Considered and eliminated in Local Funding EIR and Phase 2 EIS.)

- **Construction of a New Setback Levee.** This alternative would involve construction of a 5-mile-long levee along the northern reaches of the Sacramento River east levee parallel to the existing levee alignment but set back from the existing alignment by 500–1,000 feet. This alternative was eliminated because it is infeasible due to: (1) the presence of waterside residences along the existing levee from the southern end of Sacramento River east levee Reach C:2 to the American River north levee, and the need to maintain access to these residences from Garden Highway; (2) the proximity of the Sacramento River east levee to the Airport, and the need to prevent project features from increasing potential hazards to aviation safety; and (3) the possibility that utility relocations (power poles) and flood damage reduction measures could encroach into surface slopes of runway approach zones. (Considered and eliminated in Phase 2 EIR and Phase 2 EIS.)

- **Raise Levee in Place with a 1,000-Foot Levee Setback in the Upper 1.4 Miles along the Sacramento River East Levee.** This alternative would have provided a location for a substantial amount of tree planting on the waterside of the setback levee, contributing to the offsetting mitigation for the loss of the trees that may need to be removed along the existing levee to meet USACE criteria. This alternative was eliminated because it was unlikely that the new setback levee would provide 100-year (0.01 AEP) flood protection per USACE

criteria. (Considered and eliminated in Phase 2 EIR, and analyzed, but not selected as the Proposed Action, in Phase 2 EIS.)

- **Construct an Adjacent Setback Levee with a 500-Foot Levee Setback in the Upper 1.4 Miles along the Sacramento River East Levee.** This alternative was evaluated because it would provide the opportunity for partially offsetting the loss of landside tree groves through the establishment of new riparian plantings in the levee setback area, as well as woodland plantings on the landside of the adjacent setback levee. This alternative was eliminated because it would require substantially greater quantities of borrow material with greater impacts on Important Farmland and transportation and circulation. (Considered and eliminated in Phase 2 EIR, and analyzed, but not selected as the Proposed Action, in Phase 2 EIS.)

- **No SAFCA Levee Improvements—Private Levees in Natomas.** This alternative was analyzed assuming that there would be no SAFCA project providing flood damage reduction in the Basin, thus causing private developers to separately fund and implement individual flood damage reduction in the form of private compartment levees that would protect new developments. This alternative was eliminated because it would (1) only partially meet the objective of providing 100-year (0.01 AEP) flood risk reduction, (2) potentially lead to increased fragmentation of habitat for special-status species, and (3) increase projected flood damages without a commensurate reduction in flood risk. (Considered and eliminated in Local Funding EIR and Phase 2 EIR.)

- **Natomas 100-Year Protection.** SAFCA analyzed the impacts associated with creation of one new assessment district, which would provide only 100-year (0.01 AEP) flood protection to the Natomas Basin, and which would use funding raised through existing Capital Assessment District Number 3 to provide the local share of the cost of completing improvements to provide 100-year (0.01 AEP) flood risk reduction to the lower American River and South Sacramento Streams Group areas (SAFCA 2007a). This alternative was eliminated because it would fail to provide groundwork for the creation of 200-year (0.005 AEP) flood risk reduction over time (SAFCA 2007a). Because this alternative represents an alternative to the proposed funding mechanisms and not an alternative to the proposed levee improvements, this alternative was not considered to be an alternative to the Phase 2 Project and was not included in the Phase 2 EIS. (Considered and eliminated in Local Funding EIR.)

- **No-Action Alternative—Airport Compartment Levee.** The Phase 2 EIS evaluated and eliminated from further consideration the No-Action Alternative—Airport Compartment Levee. The prior discussion, which is hereby incorporated by reference, is summarized as follows (see also **Appendix B1** for a summary of the impacts associated with the Airport Compartment Levee).With no authorization of the Phase 2 Project, SAFCA would not be able to meet timing objectives for providing the Natomas Basin with at least a 100-year (0.01 AEP) flood risk reduction and achieving a 200-year (0.05 AEP) flood risk reduction. Federal and State floodplain regulations would prevent new development in most of the Natomas Basin. Either the Airport would be compelled to operate within its existing footprint, abandoning its current plans for modernization and expansion, or, alternatively, the Airport may construct its own limited flood damage reduction structure (i.e., a ring levee) to protect existing facilities and its expansion area. This alternative was eliminated because: (1) construction of a separate levee around the Airport would be under the responsibility and jurisdiction of another agency (Sacramento County Airport System [SCAS]), over which SAFCA would have no jurisdiction, and would require a lengthy process that is completely separate from the Proposed Action; (2) the timeline for that process is unknown and there are no design plans that would enable an accurate evaluation of potential environmental impacts; and (3) the action would require SCAS to prepare a separate CEQA and, potentially, NEPA environmental document. (Considered and eliminated in Phase 2 EIR and Phase 2 EIS.)

  In addition to the reasons provided in the Phase 2 EIS, design plans are not available for this alternative, thus preventing USACE and SAFCA from accurately evaluating its potential impacts; implementation of the Airport Compartment Levee would not meet any of the goals and objectives of the project; the residents,

residences, and businesses within the Natomas Basin would not receive flood protection; implementation of the Airport Compartment Levee would only protect the Airport; and SCAS has not proposed such a project and, therefore, it is not considered a reasonable alternative.

- **Cultural Resources Impact Reduction Alternative.** The Phase 3 Project Proposed Action includes construction of deep cutoff walls in Sacramento River east levee Reach B:5A–9B, which have the potential to result in significant and unavoidable impacts on known prehistoric resources, previously unidentified cultural resources, and human remains. Construction of a 500-foot-wide seepage berm rather than deep cutoff walls would avoid the deep ground-disturbing work that may adversely affect potential cultural resources, while still achieving flood damage reduction objectives. This alternative was eliminated because of the intensity and severity of environmental impacts associated with construction, including the temporary closure, disruption, and redesign of all or portions of the Teal Bend Golf Club. This alternative would have resulted in impacts on ten environmental topic areas (hydrology and hydraulics, sensitive aquatic habitats, vegetation and wildlife, special-status terrestrial species, paleontological resources, transportation and circulation, air quality, visual resources, recreation, utilities and service systems, and hazards and hazardous materials) that would be potentially more substantial than those associated with the Proposed Action; and there would be a net increase in the number, intensity, and severity of environmental impacts relative to the Proposed Action. (Considered and eliminated in Phase 3 EIS and EIR.) See **Appendix B1** for analyses of each specific environmental issue area.

  Although this alternative was eliminated in the Phase 3 EIS and EIR as an alternative to the Phase 3 Project Proposed Action, 500-foot-wide seepage berms were analyzed in the Phase 4a EIS and EIR as part of the Phase 4a Project Proposed Action to represent the worst-case scenario because it is anticipated that at least one very large cultural site may require avoidance (CA-Sac-16/H), and additional previously undiscovered cultural resource sites may be present.

- **Levee Raise-in-Place Alternative.** This alternative includes raising and strengthening the existing levee in Sacramento River east levee Reach B:5A–9B rather than constructing the adjacent levee. All other components of the Phase 3 Project were the same for this alternative. This alternative was found to have a greater number of significant and unavoidable impacts compared to the Phase 3 Project Proposed Action, including in the environmental issue areas of biological resources, transportation and circulation, and recreation. (Considered and eliminated in Phase 3 EIS and EIR.)

- **Raise and Strengthen Levee-in-Place (RSLIP) Alternative.** The RSLIP Alternative includes raising and strengthening the existing levee in Sacramento River east levee Reach B:10–15 rather than constructing the adjacent levee. All other components of the Phase 4a Project were the same for this alternative. This alternative was found to have a greater number of significant and unavoidable impacts in the environmental issue area of biological resources compared to the Phase 4a Project Proposed Action. (Considered and eliminated in Phase 4a EIS and EIR.)

The following additional alternative was considered by USACE to reduce flood risk in the Natomas Basin, but was eliminated from further consideration.

- **Upstream Transitory Storage.** Various upstream transitory storage measures were evaluated as part of the Common Features/Natomas PACR/Phase 4b Project. Initial evaluation indicates that these measures would not be cost-effective. Downstream benefits would not be increased to a degree sufficient to justify the costs associated with implementing this alternative, including: construction of intake and outtake structures for water to enter and leave the detention basins, improvements to the perimeter levees around the detention basin(s) to current standards, acquisition costs of real estate easements for water storage, and acquisition and/or relocation of existing properties in the storage basins. In addition, the need to correct deficiencies related to seepage and stability in the levees around the entire perimeter of the Natomas Basin has to be addressed regardless of any use of upstream storage measures. Because of the extent and likely cost of these

improvements, all of which would lie outside the projeet footprint and outside the project proponent(s)'s jurisdiction, these measures would require an unprecedented degree of State, Federal, and local cooperation and funding. For this reason, this measure was not pursued as a component of the Common Features/Natomas PACR/Phase 4b Project, but is considered worthy of further evaluation as part of the State's pending update of the State Plan of Flood Protection for the Central Valley. (Considered and eliminated in Phase 4b EIS/EIR.)

2.1.6 ALTERNATIVES CARRIED FORWARD FOR EVALUATION IN THIS EIS/EIR

The following Phase 4b Project alternatives were carried forward for detailed analysis in this EIS/EIR:

- **No-Action Alternative**—Under NEPA, the expected future without-project conditions; under CEQA, the existing condition at the time the notice of preparation was published (November 5, 2009) as modified by what would be reasonably expected to occur in the foreseeable future if the Phase 4b Project were not approved (two scenarios are proposed).

- **Adjacent Levee Alternative (Proposed Action)**—An adjacent levee would be constructed along the Sacramento River east levee Reach A:16–20; and, where required for this levee, cutoff walls, seepage berms, and relief wells would be installed for seepage remediation. A cutoff wall would be installed in the American River north levee east of Gateway Oaks Drive to Northgate Boulevard, and the landside slope would be flattened. The NEMDC west levee would be raised in place or widened from just south of Elkhorn Boulevard to Sankey Road, and the landside slope would be flattened and seepage remediation would be constructed as necessary. Waterside erosion protection would be constructed in locations along the PGCC and NEMDC (south of Elkhorn Boulevard). Culverts located beneath the PGCC would be upgraded or removed, and replacement flood storage would be provided as needed. At the SR 99 crossing of the NCC, seepage remediation would be installed and a moveable barrier system would be constructed to prevent overflow from reaching the landside of the NCC south levee. The western portion of the West Drainage Canal would be realigned to the south, and the remaining portion of the existing canal would be improved to reduce bank erosion and sloughing, decrease aquatic weed infiltration, improve RD 1000 maintenance access, and enhance giant garter snake habitat connectivity. Irrigation canals and ditches would be relocated either to make room for expanded levee sections or to reduce underseepage potential. Discharge pipes for RD 1000 pumping plants and City of Sacramento sump pumps would be raised to cross the levee above design flood water surface elevation. Parcels in the South Fisherman's Lake and Triangle Properties Borrow Areas and at the West Lakeside School Site would be excavated and reclaimed as agricultural land. Woodland groves would be established to compensate for impacts along the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1-4, and NEMDC.

- **Fix-in-Place Alternative**—The Sacramento River east levee would be improved in place in Sacramento River east levee Reach A:16–20 and seepage remediation would be implemented. The Fix-in-Place Alternative would be the same as described for the Adjacent Levee Alternative (Proposed Action) except that the crown of the Sacramento River east levee would not be widened. This type of levee improvement would narrow the overall landside footprint by 15 feet but would require a greater extent of levee degrade to construct cutoff walls and a greater extent of encroachment removal along the Sacramento River east levee compared to the Adjacent Levee Alternative (Proposed Action).

The above three alternatives are described in detail in the remaining portions of this chapter. The Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative were developed for consideration with a focus on improvements to the Sacramento River east levee Reach A:16–20. Phase 4b Project improvements to the American River east levee Reach I:1-4, NEMDC west levee, PGCC west levee, NCC south levee, West Drainage Canal, and modifications to the landscape and irrigation/drainage system would be similar under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.

As noted above, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would use differing methods to achieve flood damage reduction objectives for the Sacramento River east levee Reach A:16–20. Therefore, the differences between the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, including effects on habitats, are the result of these differences in design of the Sacramento River east levee.

2.2 NO-ACTION ALTERNATIVE

2.2.1 NO-ACTION ALTERNATIVE—NO FLOOD DAMAGE REDUCTION MEASURES

For the purposes of NEPA compliance, the No-Action Alternative serves as the baseline against which the impacts and benefits of the action alternatives are evaluated. The No-Action Alternative consists of the conditions that would be reasonably expected to occur in the foreseeable future if Congress does not provide authorization for USACE to construct the Phase 4b Project and USACE does not grant SAFCA permission to alter the existing levees or a permit to discharge dredged or fill material into waters of the United States for the Phase 4b Project.

Without USACE permission or permits, SAFCA would not proceed with implementation of the Phase 4b Project (even though not all of the project components require USACE permission and/or permits) because SAFCA would not be able to achieve the overall project purpose, which is to upgrade the levees to reduce flood risk.

As noted under Section 2.1.3.4, "Management of Levee Vegetation and Structural Encroachments," with the exception of NEMDC South (Reach H), the presumption for the Phase 2, 3, and 4a Projects is that waterside vegetation would be eligible for a variance from USACE levee vegetation guidance criteria because, depending on the reach, the levee is already overbuilt or the levee would be upgraded to a sufficient width (adjacent levee method) such that the new levee prism would be clear of waterside vegetation. It is also assumed that the American River north levee (Reach I:1–4), a construction element addressed as part of the Phase 4b Project, may not be eligible for a variance and would potentially require waterside vegetation clearance even without the proposed levee improvements. Therefore, the No-Action Alternative assumes that no waterside vegetation is cleared except where it is required for modifications to the pumping plants analyzed as part of the Phase 2, 3, and 4a Projects; and as part of compliance with USACE levee vegetation clearance along the west levee of NEMDC South (Reach H), the south levee of the NCC (Reach D:1–2), and the north levee of the American River (Reach I:1–4).

As discussed in Section 1.3.10, "General Re-evaluation of the Common Features Project," USACE is preparing a GRR on the Common Features Project, including Natomas Basin levee improvements, that is expected to be presented to Congress in 2010. The earliest that Federal construction under a Congressionally re-authorized USACE project could begin would be 2012. Therefore, it is assumed that USACE and/or the State of California or SAFCA would begin repairs on the Natomas Basin levee system in 2012 at the earliest, and would complete the improvements providing flood risk reduction by 2016.

Based on the criteria that USACE and SAFCA, in coordination with the State, have used to select alternatives for detailed analysis, it is reasonable to assume that one of the two action alternatives described below (the Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would be implemented by USACE and/or the State or SAFCA and that the environmental effects of project construction would be the same as, or very similar to, those of the action alternatives evaluated in this EIS/EIR. In the period before implementation of flood damage reduction measures for the Natomas Basin, however, there would remain a high potential for a major levee failure and flooding of the Natomas Basin. (USACE evaluation of geotechnical information and other data indicate that a future flood event with an approximately 3% or greater probability of occurring in any year could cause a major levee failure.)

Therefore, the No-Action Alternative analyzed in this EIS/EIR consists of two scenarios: No Phase 4b Project Construction and Potential Levee Failure. "No Phase 4b Project Construction" refers to the impacts that would

result because the Phase 4b Project would not be constructed as part of the NLIP. "Potential Levee Failure" refers to the impacts that could occur if the Natomas Basin perimeter levee system failed. These two components of the No-Action Alternative are further described below, and the analysis contained in Chapter 4, "Environmental Consequences and Mitigation Measures," is presented using these subheadings.

2.2.1.1 NO PHASE 4b PROJECT CONSTRUCTION

Under the No Phase 4b Project Construction Alternative, the Phase 4b Project would not be constructed. Under CEQA, the baseline environmental condition would be the physical conditions in the Phase 4b Project area existing at the time of the publication of the Notice of Preparation. The NEPA baseline condition for determining significance of impacts includes the full range of construction that would be implemented in the Natomas Basin except for the Phase 4b Project.

Under this scenario, key segments of this system would continue to provide less than 100-year (0.01 AEP) flood risk reduction, and the entire Natomas Basin would be permanently designated as a FEMA special flood hazard area subject to development restrictions and mandatory flood insurance requirements pursuant to the regulations of the National Flood Insurance Program.

Even without construction of the Phase 4b Project, a substantial number of structural features may need to be removed from the waterside of the existing levees to meet USACE requirements as described in *Guidelines for Landscape Planting and Vegetation Management at Floodwalls, Levees, and Embankment Dams* (USACE 2000). As part of its ongoing operations and maintenance (O&M) activities, RD 1000 would be initially responsible for removal of any encroachments that would threaten levee integrity. Without construction of an adjacent levee along Sacramento River east levee Reach A:16–20, which is within the Phase 4b Project footprint, approximately 19 acres of waterside vegetation would require removal to comply with the USACE levee vegetation guidance (see Chapter 4, "Environmental Consequences and Mitigation Measures," for a detailed discussion of the impacts related to the No-Action Alternative). Because the American River north levee is considered overbuilt, including a section of NEMDC South from Northgate Boulevard to the Arden-Garden Connector, it may be eligible for a variance from USACE levee vegetation guidance.

However, without a variance, vegetation would need to be removed from the waterside in a worst-case scenario. Along the NEMDC South north of the Arden-Garden Connector (Reach H), a variance would be requested to allow waterside vegetation to remain within 15 feet (waterward) of the waterside levee toe, with approximately 0.57 acres of vegetation to be removed from the levee slope (see **Table 4.7-2** in "Biological Resources"). This 0.57 acre of vegetation is primarily the canopy area of 18 trees varying between approximately 2 to 55 inches dbh that occur in the lower 1/3 of the levee slope, and 3 trees varying between approximately 26 and 46 inches dbh that occur in the upper 2/3 of the levee slope (ending at the waterside hinge point). The memorandum summarizing the results of the tree survey conducted for these trees is detailed in **Appendix D3**. Replacement plantings for these trees, which provide riparian and SRA habitat value, would be consistent with the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (DFG) guidelines for appropriate riparian species and spacing according to the terms of the permits discussed below. Under a worst-case scenario, approximately 1.15 acres of vegetation would be cleared to within 15 feet of the waterside levee toe in the event a variance is not granted. Along the NCC south levee (Reach D), vegetation on the lower 1/2 of the waterside levee slope would be eligible for a variance from USACE's levee vegetation guidance. However, without a variance, vegetation would need to be removed from the waterside in a worst-case scenario. Mitigation implementation would be considered part of levee maintenance and would be the subject of a future, separate environmental document. Environmental permits and other regulatory approvals would also be required, which may include a California Fish and Game Code Section 1602 Streambed Alteration Agreement, Clean Water Act Section 401 permit, and/or Clean Water Act Section 404 permit.

Without Phase 4b Project improvements, Federal and State floodplain regulations would effectively prevent most new development in most of the Natomas Basin. Existing residential, commercial, and industrial development

would continue to be concentrated in the southeastern portion of the Basin, south of Elkhorn Boulevard, occupying approximately one-third of the 53,000 acres encompassed by the perimeter levee system. Approximately two-thirds of the Basin, generally north of Elkhorn Boulevard, would remain in some form of agricultural, agricultural support, or open space use along with Airport uses. The Airport may be compelled to operate within its existing footprint, abandoning its current plans for modernization and expansion; alternatively, the Airport may construct its own limited flood damage reduction structure (i.e., a ring levee) to protect existing facilities and its expansion area. As of December 31, 2007, all agricultural leases on Airport property expired and have not been renewed. Some new development could occur along the eastern fringe of the Basin. The special flood hazard designation in the Natomas Basin would interrupt the regional blueprint for future (2030) growth adopted by the Sacramento Area Council of Governments and Valley Vision in 2006 (**Plate 2-5**). Up to 60,000 dwelling units and associated commercial and industrial developments that the blueprint anticipates will be located in the Natomas Basin would need to be redirected to other areas in the region over the next two decades. The Basin's existing residential, commercial, and industrial structures and their contents, with a replacement value of approximately $8.2 billion, or approximately $7.2 billion if the Airport facilities are excluded, would remain subject to a relatively high risk of flooding. The risk of environmental damage resulting from flooding in the urbanized portion of the Basin would remain relatively high.

2.2.1.2 Potential Levee Failure

The same conditions with respect to development within the Natomas Basin, as described above for the No Phase 4b Project Construction scenario, would exist for the Potential Levee Failure scenario. Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Wind and wave run-up or seepage conditions could cause portions of this system to fail, triggering widespread flooding and extensive damage to the Basin's existing residential, commercial, agricultural, and industrial structures. Extensive damage to utilities, roadways, and other infrastructure systems would also likely occur. According to the Sacramento County Department of Water Resources, a levee failure could result in nearly complete inundation of the Basin with water level depths that could average 10 to 20 feet, and potentially reach over 30 feet in some areas (Sacramento County Department of Water Resources 2008); however, the magnitude of the flood damage would depend upon the location of the levee breach, severity of the storm, and river flows at the time of a potential levee failure (Sacramento County Department of Water Resources 2009).

Because impacts associated with a potential levee failure are largely unknown and would depend on the location and extent of flooding, many of these potential impacts are considered too speculative for meaningful consideration. A general, qualitative discussion of the likely impacts is nonetheless provided in this EIS/EIR.

2.2.2 No-Action Alternative—Implementation of Phase 1, 2, 3, and 4a Projects Only

USACE has already authorized construction of the Phase 1 and 2 Projects. Under this alternative, it is reasonably foreseeable as part of the NEPA environmental baseline that USACE will authorize construction of the Phase 3 and 4a Projects, but will not authorize the Phase 4b Project. Each of these project phases has independent utility from the Phase 4b Project. This alternative includes the following Phase 1, 2, 3, and 4a Project activities:

Phase 1 Project (Completed in 2008)

- **NCC south levee improvements: Seepage remediation**—Construct a seepage cutoff wall along the centerline of the NCC south levee in Reach D:1–3 (to overlap the Sacramento River east levee by approximately 500 feet) and reconstruct the levee.

Phase 2 Project (Currently under construction)

- **NCC south levee improvements: Levee raising and seepage remediation**—Raise and realign the NCC south levee to provide additional height and more stable waterside and landside slopes, and to reduce the need to remove waterside vegetation. Construct seepage cutoff walls through the levee crown in Reach D:3–7.

- **Sacramento River east levee (Reach C:1–4B): Levee raising and seepage remediation**—Construct an adjacent levee from the NCC to the end of Reach C:4B, raised where needed to provide adequate height. Use a combination of cutoff walls, seepage berms, and relief wells for seepage remediation where required.

- **Construction of a new Giant Garter Snake (GGS)/Drainage Canal between the North Drainage Canal and Elkhorn Reservoir**—Construct a new canal designed to provide drainage and associated giant garter snake habitat (referred to as the "GGS/Drainage Canal") from the North Drainage Canal to the slough east of Elkhorn Reservoir in Reach C:4B and B:5A–6B.

- **Relocation of the Elkhorn Canal (highline irrigation canal) between the North Drainage Canal and Elkhorn Reservoir**—Relocate approximately 10,500 feet of the canal and construct the relocated canal several hundred feet east of the landside toe of the Sacramento River east levee in Reach C:4B–6A.

- **Removal of a deep culvert at the location of Pumping Plant No. 2**—Excavate and remove approximately 400 feet of the existing levee section adjacent to the RD 1000 Pumping Plant No. 2 site to expose a deep culvert and possible voids under the levee; remove the deep culvert; reconstruct the levee adjacent to the pumping plant's sump with levee embankment fill; and demolish, remove, and relocate the remnants of the pumping plant within the project footprint.

- **Habitat creation and management**—Establish habitat features for giant garter snake in the new GGS/ Drainage Canal. Recontour and create managed marsh and grassland on lands used as borrow sources to offset project effects on giant garter snake and Swainson's hawk habitats. Establish grassland on the slopes of the adjacent levee and seepage berms. Install woodland plantings to offset the loss of portions of tree groves within the landside levee footprint.

- **Infrastructure relocation and realignment**—Realign and relocate irrigation and drainage canals and other infrastructure, such as utility poles, as needed to accommodate the flood damage reduction measures.

- **Encroachment management**—Remove encroachments as required to meet the criteria of USACE, the CVFPB, and FEMA.

- **Reclamation of borrow sites**—Excavate earthen material at the borrow sites, then return the sites to preconstruction uses or suitable replacement habitat.

Phase 3 Project (Preliminary construction began in fall 2009; major levee construction planned to begin in 2010)

- **Sacramento River east levee (Reach B:5A–9B): Levee raising and seepage remediation**—Construct a raised adjacent levee from just north of Elverta Road to just south of I-5. Use cutoff walls, seepage berms, and relief wells where required to reduce seepage potential. Acquire additional land in Reach B:9B to maintain a 450-foot protection corridor to prevent land uses that would be incompatible with proposed levee improvements.

- **Pleasant Grove Creek Canal (PGCC) west levee: Levee raising, slope flattening, and widening, and seepage remediation**—Raise the existing levee between Howsley Road and Sankey Road, flatten and widen the levee slopes, and construct cutoff walls or seepage berms to reduce seepage potential.

- **Natomas East Main Drainage Canal (NEMDC) west levee from Elkhorn Boulevard to NEMDC Stormwater Pumping Station: Levee widening and flattening and seepage remediation**—Widen and flatten the slopes of the existing levee and construct a cutoff wall to reduce seepage potential.

- **NEMDC west levee from NEMDC Stormwater Pumping Station to Northgate Boulevard: Seepage and slope stability remediation**—Construct a cutoff wall in the existing levee and/or reconstruct portions of the levee where required to reduce seepage potential and slope instability.

- **Relocation of portions of the Elkhorn Canal downstream of Elkhorn Reservoir**—Pipe approximately 9,400 feet of the canal between the new adjacent levee and Teal Bend Golf Club in Reach B:6B–7, and in an area adjacent to the landside residential properties in Reach B:8; and reconstruct the canal parallel to the adjacent levee at a distance of approximately 200 feet from the levee in Reach B:7–9A.

- **Construction of a new GGS/Drainage Canal downstream of Elkhorn Reservoir**—Construct a new canal designed to provide drainage and associated giant garter snake habitat (GGS/Drainage Canal) between Elkhorn Reservoir and the West Drainage Canal at I-5.

- **Habitat creation and management**—Establish habitat features for giant garter snake in the new GGS/ Drainage Canal. Recontour and create managed marsh and grassland on lands used as borrow sources to offset project effects on giant garter snake and Swainson's hawk habitats. Establish grassland on the slopes of the adjacent levee and seepage berms. Install woodland plantings to offset the loss of portions of tree groves within the landside levee footprint.

- **Infrastructure relocation and realignment**—Realign and relocate irrigation and drainage canals and other infrastructure, such as utility poles, as needed to accommodate the flood damage reduction measures.

- **Removal of landside vegetation**—In Reach B:10–12A of the Sacramento River east levee, clear landside vegetation in a 670-foot-wide corridor to prepare for future flood damage reduction work.

- **Encroachment management**—Remove encroachments as required to meet the criteria of USACE, the CVFPB, and FEMA.

- **Reclamation of borrow sites**—Excavate earthen material at the borrow sites, then return the sites to preconstruction uses or suitable replacement habitat.

- **Reconfiguration of Airport West Ditch**—Modify irrigation distribution and agricultural drainage systems and infrastructure to allow for dewatering of the Airport West Ditch.

- **Acquisition of right-of-way**—Acquire right-of-way through fee title or easement interest within the footprint of the project features and at the borrow sites, and prevent encroachments into the flood damage reduction system.

Phase 4a Project (Preliminary construction planned to begin in spring/summer 2011)

- **Sacramento River east levee (Reach B:10–15): Levee raising/rehabilitation and seepage remediation**—Construct an adjacent levee, raised in Reach B:10–11B, with cutoff walls, seepage berms, and relief wells, where required, to reduce seepage potential. Cutoff wall construction would continue 24 hours per day, 7 days per week (24/7).

- **Sacramento River east levee (Reach C:4B): Seepage remediation**—Install cutoff wall in the adjacent levee from Stations 190+00 to 201+50 to provide additional seepage remediation.

- **NCC south levee: Levee raising and seepage remediation at two locations**—At the Natomas Central Mutual Water Company (NCMWC) Bennett Pump Station and Northern Main Pump Station, raise the NCC south levee, flatten levee side slopes, install cutoff wall, and modify or replace the existing pumps and motors to reflect raising the discharge pipes above the 200-year design flood elevation. Cutoff wall construction would continue 24/7.

- **Replacement of South Lauppe Pump**—At Sacramento River Mile 77.2 (left bank), remove the pump, intake, and support structure prior to initiation of a separate USACE project to construct bank protection at the site. Following completion of USACE's bank protection project, SAFCA would reconstruct the pump, intake, and support structure.

- **Modification of Private River Pumps**—Raise discharge pipes and upgrade motors and pumps at nine private river pumps at NCC south levee Reach D:1 and Sacramento River east levee Reaches C:1–2 and B:11A–12A to be compatible with approved and proposed levee improvements.

- **Riverside Canal (highline irrigation canal) relocation and extension**—Extend the relocated canal upstream of Powerline Road in Reach B:11B–12B of the Sacramento River east levee; relocate the canal east of the adjacent levee in Reach B:13–15 and east of the adjacent levee, residences, and tree groves in Reach B:15–17; and construct a piped section in Reach B:15–18B at the toe of the new adjacent levee.

- **Modifications to NCMWC Riverside Pumping Plant**—Raise the pumping plant's discharge pipes above the 200-year design water surface and modify or replace the plant's existing pumps and motors to accommodate the raised discharge pipes. In-water construction would include use of dredge pumps to remove sediment so that new pumps could be installed, but no dewatering involving use of a cofferdam is anticipated.

- **Modifications to RD 1000 Pumping Plants Nos. 3 and 5**—Raise the pumping plants' discharge pipes above the 200-year design water surface, extend the pipes to tie into existing discharge pipes within the waterside bench, replace or modify pumps and motors, and perform other seepage remediation, including relocating the landside stations away from the levee to accommodate the raised discharge pipes. Most of these modifications would take place above the Sacramento River's normal summer and fall water surface elevations; however, reconstruction of the Pumping Plant No. 3 outfall and the removal of a deep culvert at Pumping Plant No. 3 would require dewatering.

- **Development of new and replacement groundwater wells**—Abandon approximately 13 agricultural wells and replace the wells in locations outside the footprint of the levee improvements. Additionally, construct five new wells to provide a water supply for habitat mitigation features. Drilling of the wells would require construction to continue 24 hours per day for up to 3 days to avoid collapse or seizing of drill equipment within the hole.

- **Borrow site excavation and reclamation**—Excavate earthen material at the borrow sites and then return the sites to preconstruction uses or suitable replacement habitat. For the Phase 4a Project levee and canal improvements along the Sacramento River east levee, the Fisherman's Lake Borrow Area is anticipated to be the primary source of soil borrow material. However, additional borrow sites may be needed for Phase 4a Project work along the Sacramento River including the I-5 Borrow Area; the Elkhorn Borrow Area; South Sutter, LLC; Krumenacher; the Airport north bufferlands; and the Twin Rivers Unified School District stockpile site. For the Phase 4a Project construction on the NCC south levee, the Brookfield borrow site is anticipated to be the primary source of soil borrow material. Some of these borrow sites (Elkhorn Borrow Area; Airport north bufferlands; Krumenacher; Twin Rivers Unified School District stockpile site; and South Sutter, LLC) have been fully analyzed in previous environmental documents; therefore, their potential impacts are incorporated by reference into this EIS/EIR. The Fisherman's Lake and I-5 Borrow Areas are fully analyzed in the Phase 4a EIS and EIR.

- **Habitat creation and management**—Establish a habitat complex in the Fisherman's Lake Borrow Area (Fisherman's Lake Habitat Complex) through the creation of approximately 140 acres of agricultural upland habitat; establishment of perennial native grasses on levee slopes, seepage berms, and access and maintenance areas; creation of up to 120 acres of managed seasonal and perennial marsh; and establishment of woodlands consisting of native riparian and woodland species at locations along the landside of the Sacramento River east levee.

- **Infrastructure relocation and realignment**—Realign and relocate private irrigation and drainage infrastructure (wells, pumps, canals, and pipes); and relocate utility infrastructure (power poles) as needed to accommodate the levee improvements and canal relocations.

- **Landside vegetation removal**—In Reach B:12B–15 of the Sacramento River east levee, clear landside vegetation in a corridor up to 660 feet wide to prepare for Phase 4a Project levee and canal improvement work.

- **Waterside vegetation removal**—Up to 4 acres of waterside vegetation would be removed due to replacement of pumping plants and construction of outfalls in Reach B:10–15 of the Sacramento River east levee.

- **Right-of-way acquisition**—Acquire lands within the Phase 4a Project footprint along the Sacramento River east levee, NCC south levee, and at associated borrow sites.

- **Encroachment management**—Remove encroachments as required to meet the criteria of USACE, CVFPB, and FEMA.

- **Exchange of properties between SAFCA and SCAS in Reaches C:4A and B:5B–6 of the Sacramento River east levee**—SAFCA and SCAS would carry out a land exchange that would support expansion of Airport bufferlands along the eastern edge of the new Elkhorn Irrigation Canal and provide SAFCA additional habitat mitigation land along the upper portion of the Sacramento River east levee outside of the 10,000-foot Airport Critical Zone.

Even assuming implementation of the Phase 1, 2, 3, and 4a Projects, under the Phase 4b Project No-Action Alternative the Natomas Basin would still face elevated flood risks because some components of the Natomas perimeter levee system would remain unimproved (primarily the Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4). Those risks would be reduced by the Phase 4b Project because the Phase 4b Project includes the remaining improvements needed to achieve the NLIP's overall project objective of bringing the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas.

2.3 PROPOSED ACTION

2.3.1 POST-AUTHORIZATION CHANGE REPORT

As noted above and in Chapter 1, "Introduction and Statement of Purpose and Need," this EIS/EIR will support approval of USACE's Common Features/Natomas PACR. The Common Features/Natomas PACR includes all four project phases (1, 2, 3, and 4a and 4b) of the Landside Improvements Project, which is a component of the NLIP. This EIS/EIR summarizes environmental analyses for all previously approved project phases, as well as previously released public draft documents of the Landside Improvements Project, including alternatives previously considered, analyzed, and rejected from further consideration, and evaluates at a project-level the environmental effects of the proposed Phase 4b Project.

2.3.2 NATOMAS LEVEE IMPROVEMENT PROGRAM

SAFCA has developed the NLIP to address identified deficiencies in the levee system protecting the Natomas Basin in Sacramento and Sutter Counties, California. The objectives of the NLIP, as adopted by SAFCA, are to: (1) provide at least 100-year (0.01 AEP) flood risk reduetion to the Natomas Basin as quickly as possible; (2) provide 200-year (0.005 AEP) flood risk reduction to the Basin over time; and (3) avoid any substantial increase in annual flood damages as new development occurs in the Basin. The relationship of the Landside Improvements Project phases, including the Phase 4b Project, to one another and their relationship to this EIS/EIR are summarized in Section 1.5.4, "Natomas Levee Improvement Program Environmental Documentation and Relationship of this EIS/EIR to Other Documents."

2.3.3 PHASE 4b PROJECT

2.3.3.1 INTRODUCTION

The Phase 4b Project would address underseepage, stability, erosion, penetrations, and levee encroachments along approximately 3.4 miles of the Sacramento River east levee in Reach A:16–20, approximately 1.8 miles of the American River north levee (Reach I:1–4), approximately 6.8 miles of the NEMDC west levee (Reaches F–G), approximately 3.3 miles of the PGCC west levee (Reach E), and the gaps left in the improvements of previous phases at levee penetrations and road crossings on the NCC south levee. The Phase 4b Project would also include relocation of the existing irrigation and drainage canals landside of the levee slopes, and relocation and modifications of the pumping plants, bridges, encroachments, and any penetrations of the levee embankment. Vegetation removal within the levee right-of-way to address USACE requirements and any environmental mitigation are also included in the Phase 4b Project. Levee height deficiencies would also be addressed along the northern segment of the NEMDC west levee and along the PGCC west levee. The Phase 4b Project also includes the proposed extension of a levee raise in Reach B:12A–13 that was previously addressed as part of the Phase 4a Project.

Construction of the Phase 4b Project is anticipated to begin as early as 2012 and is expected to be completed in 2013, assuming receipt of all required environmental clearances, permits, and approvals for project implementation. For the purposes of environmental analysis, the construction schedule would be as follows:

- American River north levee (Reach I:1–4) and NEMDC South (Reach H)—start construction as early as 2012 and complete in 2013.
- NEMDC North (Reaches F–G)/PGCC (Reach E) and Sacramento River east levee (Reach A:16–20)—start construction in spring 2013 and complete in 2016.

In a worst-case scenario, construction of the Phase 4b Project would overlap with construction of levee improvements previously addressed as part of the Phase 3 and 4a Projects (and approved by SAFCA and USACE [Phase 2 and 3 Projects]). Construction of the Phase 4a Project, which was analyzed in the Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f), would begin in 2011 and be completed in 2012. Therefore, for purposes of the environmental analysis, it is assumed that Reach B:13–15 of the Sacramento River east levee and all of the relocation of the Riverside Canal from the Phase 4a Project would be constructed simultaneously with portions of the Phase 4b Project in 2012. **Table 4.11-1** in Section 4.11, "Air Quality," shows detailed construction assumptions.

The Phase 3 EIS and EIR (USACE 2009b and SAFCA 2009b) analyzed the impacts of installation of a cutoff wall in NEMDC South (Reach H) and levee raising, slope flattening, and widening along the PGCC west levee. Because these elements are contained within or otherwise associated with the proposed improvements of the Phase 4b project at NEMDC South (Reach H) and PGCC (Reach E), they would be constructed at the same time, as shown in **Table 2-1**.

Table 2-1
Overlapping Environmental Coverage of the Phase 3 and 4b Projects

Project Element	Construction Timing/Overlap	Phase 3 Project Environmental Coverage	Phase 4b Project Environmental Coverage
NEMDC South (Reach H)	2013–2016	Cutoff wall installation	Levee raising south of Elkhorn Boulevard (Stations 313+00 to 318+00), erosion repair, and pumping plant modifications (Compliance with levee vegetation guidance along the west levee of NEMDC South [north of the Arden-Garden Connector] would be completed by 2016)
PGCC west levee (Reach E)	2013–2016	Levee raising, slope flattening, levee widening, and installation of a cutoff wall	Levee raising, additional levee widening, seepage berm option, PGCC culvert remediation, erosion repair, and excavation of soil borrow material from the Triangle Properties Borrow Area

Note:
[1] For the PGCC west levee, the levee raise analyzed as part of the Phase 3 Project would be constructed as part of the levee raise addressed in the Phase 4b Project. Therefore, air quality emissions for overlapping construction on the PGCC are equivalent to the emissions estimated for the PGCC component of the Phase 4b Project.
Source: Data compiled by AECOM in 2010

Phase 3 Project levee improvements along the Sacramento River east levee Reach B:5A–9B would be entirely constructed in 2010 and would not overlap with construction of the Phase 4b Project; however, as noted **Table 2-1**, construction of the NEMDC South cutoff wall (included in the Phase 3 Project) would overlap with construction of the Phase 4b Project.

2.3.3.2 ADJACENT LEVEE ALTERNATIVE (PROPOSED ACTION)

Plate 2-6 provides an overview of the elements of the Adjacent Levee Alternative (Proposed Action) along with previous project phases. The Adjacent Levee Alternative (Proposed Action) has the following major elements:

- **Sacramento River east levee (Reach A:16–20): Levee widening/rehabilitation and seepage remediation**—Construct an adjacent levee with flattened landside slope and cutoff walls, seepage berms, and relief wells, where required, to reduce potential underseepage and seepage through the levee (**Plates 2-7a** and **2-7b**). Cutoff wall construction may be conducted 24/7, except in the urbanized area east of the Interstate 80 (I-80) overcrossing, where it would be restricted to daytime hours.
- **Sacramento River east levee (Reach B:10–15): Levee raise extension**—Extend levee raise within Phase 4a Project footprint from Station 635+00 to 680+00 to address levee height requirements.
- **American River north levee (Reach I:1–4): Slope flattening and seepage remediation**—Flatten the slope and install cutoff walls in the American River north levee from just east of Gateway Oaks Drive to Northgate Boulevard (**Plate 2-9**). Cutoff wall construction would be restricted to daytime hours.
- **NEMDC North (Reaches F–G): Levee raising, slope flattening, and seepage remediation**—Raise the levee in place or construct an adjacent levee, flatten slopes, and install cutoff walls from Sankey Road to Elkhorn Boulevard. Cutoff wall construction may be conducted 24/7.
- **PGCC (Reach E) and NEMDC South (Reach H): Levee raising and slope flattening**—Raise the levee in place or construct a raised adjacent levee and flatten slopes from Howsley Road to Sankey Road on the PGCC west levee (**Plate 2-13**). On the NEMDC South, install a cutoff wall, flatten the slope, and raise the levee in place or construct an adjacent levee for approximately 500 feet south of Elkhorn Boulevard (**Plate 2-14**). Cutoff wall construction may be conducted 24/7.

- **PGCC (Reach E) and NEMDC South (Reach H): Waterside improvements**—Erosion repair and rock slope protection at locations where erosion around the outfall structures penetrating the levee has been observed. Construct additional remediation to protect against damage caused by beavers and burrowing animals (**Plates 2-13** and **2-14**).

- **PGCC (Reach E) culvert remediation**—Upgrade or remove five culverts that currently drain the area east of the PGCC by passing water under the canal to drainage ditches along the landside of the PGCC west levee (**Plate 2-13**). Under the culvert removal option, construct detention basins east of the PGCC levee to provide replacement storage for drainage. Depending on the design of the detention basins, pumping stations may be needed to discharge water out of the basins and into the PGCC. Installation of culverts under Pierce-Roberts drain, Pleasant Grove Creek, and Curry Creek may also be needed to interconnect drainage subbasins.

- **SR 99 NCC Bridge remediation (Reach D:6)**—Construct a moveable barrier system or a stop log gap at the south end of the SR 99 bridges to be used at high river stages to prevent overflow from reaching the landside of the NCC south levee. Modify the bridge deck connections to the supporting piers and abutments as needed to resist uplift pressure during high water stages. Install additional seepage remediation consisting of seepage cutoff walls where the bridges cross the NCC south levee (Reach D:6). Cutoff wall construction may be conducted 24/7.

- **West Drainage Canal**—Realign the West Drainage Canal to shift an approximately 1-mile portion, starting at I-5, to an alignment farther south of the Airport Operations Area. Modify the existing canal east of the alignment to reduce bank erosion and sloughing, decrease aquatic weed infiltration, improve RD 1000 maintenance access, and enhance giant garter snake habitat connectivity.

- **Riego Road Canal (highline irrigation canal) relocation**—Relocate approximately 4,000 feet of irrigation canal, approximately 250 feet of buried irrigation piping and culverts, and several irrigation turn-out structures away from the proposed levee footprint for the northern segment of the NEMDC west levee (Reaches F–G).

- **NCC south levee ditch relocations**—Relocate the Vestal Drain ditch and Morrison Irrigation Canal landward to reduce underseepage potential at the NCC south levee (Reach D:2, 5, and 6).

- **Modifications to RD 1000 Pumping Plants**—Raise and/or replace the discharge pipes for Pumping Plant Nos. 1A and 1B along the Sacramento River east levee and Pumping Plant Nos. 6 and 8 along the NEMDC west levee (Reaches G–H). Construct new outfall structures for Pumping Plant Nos. 6 and 8, requiring dewatering of portions of the NEMDC. Construction for Pumping Plant Nos. 6 and 8 may be conducted 24/7.

- **Modifications to City of Sacramento Sump Pumps**—Raise and/or replace the discharge pipes for City Sump 160 (Sacramento River east levee Reach A:19B), City Sump 58 (American River north levee [Reach I:3]), and City Sump 102 (NEMDC west levee at Gardenland Park [Reach H]). Construct new outfall structures, requiring dewatering of portions of the Sacramento River, the low-flow channel of the NEMDC along the waterside of the American River north levee, and the NEMDC. Relocate pump stations as needed to accommodate the proposed levee improvements. Construction City Sump 102 may be conducted 24/7.

- **Borrow site excavation and reclamation**—Excavate earthen material at the borrow sites and then return the sites to preconstruction uses or suitable replacement habitat. For levee improvements along the Sacramento River east levee (Reach A:16–20) and the American River north levee (Reach I:1–4), the proposed South Fisherman's Lake Borrow Area (**Plate 2-7a**) and the West Lakeside School Site (**Plate 2-17**) are anticipated to be the primary source of soil borrow material. A portion of the Fisherman's Lake Borrow Area (identified on **Plate 2-6**), which was fully analyzed in the Phase 4a EIS/EIR, could provide additional borrow material for these improvements. The proposed Triangle Properties Borrow Area (**Plate 2-13**) would be the primary source of borrow material for levee improvements along the PGCC (Reach E) and NEMDC North (Reaches F–G). The Krumenacher borrow site and Twin Rivers Unified School District stockpile site (**Plate 2-14**), which were fully analyzed in previous environmental documents, would be the source of borrow material for

improvements to NEMDC South and back-up sources for NEMDC North (Reaches F–G). The South Fisherman's Lake Borrow Area, the West Lakeside School Site, and the Triangle Properties Borrow Area are fully analyzed in this EIS/EIR.

- **Habitat creation and management**—Enhance connectivity between northern and southern populations of giant garter snake in the Natomas Basin by improving habitat conditions along the West Drainage Canal; establish woodlands consisting of native riparian and woodland species in the vicinity of the American River Parkway as compensation for woodland impacts along the Sacramento River east levee (Reach A:16–20), American River north levee (Reach I:1–4), PGCC (Reach E), and NEMDC (Reaches F–H); and create up to 200 acres of managed marsh from Brookfield borrow site to compensate for impacts to giant garter snake habitat as a result of loss of rice from levee and canal improvements, widen and extend the Chappell Ditch south of the borrow site to enhance delivery of surface water, and improve the adjacent Chappell Drain.

- **Infrastructure relocation and realignment**—Relocate and realign private irrigation and drainage infrastructure (wells, pumps, canals, and pipes) and water and sanitary sewer lines, and relocate utility infrastructure (power poles) as needed to accommodate the levee improvements and canal relocations. Well construction may be conducted 24/7.

- **Landside vegetation removal**—In Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, and NEMDC South (Reach H), vegetation would be cleared to prepare for Phase 4b Project levee and canal improvement work. To comply with USACE vegetation guidance, all vegetation would be cleared at least 15 feet from the landside toes of the improved levees (Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4).

- **Waterside vegetation removal**—Waterside vegetation would be removed due to erosion control measures and modifications to pumping plants along the Sacramento River east levee (Reach A:16–20), NEMDC west levee (Reaches F–H), and PGCC west levee (Reach E). However, it is assumed that construction of an adjacent levee (the Adjacent Levee Alternative [Proposed Action]) in Sacramento River east levee Reach A:16–20 would allow the levee to qualify for a variance from USACE vegetation guidance criteria such that removal of waterside vegetation would not be necessary. Along the American River north levee Reach I:1–4, the levee is already considered overbuilt, and therefore it may also qualify for a variance from USACE vegetation guidance, allowing waterside vegetation to remain. Like the American River north levee, a section of NEMDC South from Northgate Boulevard to the Arden-Garden Connector is also assumed to be overbuilt enough that clearance of waterside vegetation would also not be neeessary under a variance request to USACE. In the event a variance is not granted for the American River north levee (including the segment between Northgate Boulevard and the Arden-Garden Connector), waterside vegetation could be removed from the upper two-thirds of the levee slope. Along the west levee of NEMDC South north of the Arden-Garden Connector (Reach G), at a minimum, if a variance request is granted by USACE, vegetation removal would be required for all non-native trees from within the vegetation-free zone; all native trees that have a dbh of four inches or less; and all larger native trees that are located on the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet). Under a worst-case scenario, vegetation with stem widths that have a dbh greater than two inches would be cleared to within 15 feet of the waterside levee toe.

- **Bank protection**—Bank protection would be constructed along the NEMDC South (Reach H) and PGCC (Reach E) to address the waterside erosion sites because, as noted above, the adjacent levee would be constructed in Sacramento River east levee Reaches A–C:1–20 under the NLIP; no erosion protection is needed along the left bank of the Sacramento River. The distance from the projected levee slope of the new adjacent levee to the current bank location is sufficient to guarantee that bank erosion would not intrude into the projected levee slope in the near future.

- **Right-of-way acquisition**—Acquire lands within the Phase 4b Project footprint along the Sacramento River east levee (Reach A:16–20), American River north levee (Reach 1:1–4), NEMDC west levee (Reaches F–G), PGCC west levee (Reach E), and at associated borrow sites.

- **Encroachment management**—Remove encroachments as required to meet the criteria of USACE, CVFPB, and FEMA. SAFCA would be required to submit a variance request to CVFPB, and then ultimately to USACE, requesting confirmation that SAFCA's adjacent levee design for the Sacramento River east levee (Reach A–C:1–20), American River north levee (Reach I:1–4), and NEMDC west levee (Reaches F–G) sufficiently addresses USACE's guidance regarding vegetation on levees, if SAFCA chooses to implement the project without Federal participation.

- **Natomas Levee Class 1 Bike Trail Project**—Construct a bicycle and pedestrian trail along the 42-mile loop of the Natomas Basin levee perimeter in the northwestern portion of the County of Sacramento, southern portion of Sutter County, and a portion of the City of Sacramento (program-level analysis only, because site-specific details are not available).

Flood Risk Reduction Components

Sacramento River East Levee (Reach A:16–20)

Levee improvements would be constructed within Reach A:16–20 (Station 780+00 to Station 956+82) of the Sacramento River east levee, a distance of approximately 3.3 miles (**Plates 2-7a** and **2-7b**), and include the following components:

- **Adjacent Levee.** A new levee would be constructed adjoining the existing Sacramento River east levee in Reach A:16–20. In these reaches, the existing levee already meets height requirements. Therefore, the top of the new levee would be no higher than the elevation of the existing levee crown, except in locations where sections would be raised to accommodate raising of drainage discharge pipe crossings. With no levee raise, the adjacent levee crown would be graded to drain towards the landside; therefore, no surface drainage outlets across Garden Highway would be required. The landside slope of the adjacent levee would be 3H:1V for Reach A:16–19A and varying 3H:1V to 2H:1V for Reach A:19B–20. The levee typical dimensions are shown in **Plates 2-8a** through **2-8d**. The adjacent levee is designed to avoid removal of vegetation on the waterside of the levee, providing a vegetation-free levee prism corresponding to USACE requirements.

- **Cutoff Walls.** Three-foot-wide cutoff walls made of either SB, cement bentonite (CB) or soil-cement-bentonite (SCB) would be installed either through the existing levee or along the landside toe of the existing levee. Depending on the construction method used, the top of the cutoff walls would be at least 5 feet above the existing ground surface at the landside toe of the levee (within either the new adjacent setback levee or existing levee) and extend to a depth of 110 feet below ground surface in some areas. Locations and depths would be determined during engineering design. The maximum linear extent would be approximately 17,700 feet (Reach A:16–20).

- **Seepage Berms.** Where the need for seepage berms is anticipated (Reach A:16–19A), widths would range from 100 to 300 feet. **Table 2-2** shows the locations of worst-case seepage berm widths by reach. Depending upon the width and geotechnical considerations, maximum thickness would be 6–9 feet. All berms would gradually slope downward to about 4 feet thick at the landside edge, with a 3H:1V slope to ground level. A gravel surface patrol road would be constructed near the outside edge of the seepage berm. Final locations of the seepage berms would be determined during engineering design.

Table 2-2
Maximum Limit of Flood Damage Reduction Improvements by Sacramento River East Levee Reach

Reach (Cross-Section Plate)	Stationing	Adjacent Levee	Seepage Remediation	Maximum Limit of Flood Damage Reduction Improvements	
		Approximate Distance from Center Line of Garden Highway		Approximate Distance from Center Line of Garden Highway	Approximate Distance from Existing Levee Toe
A:16 (Plate 2-8a)	780+00 to 799+00	83 feet	300-foot-wide seepage berm and/or cutoff wall	460 feet	405 feet
A:16, 17, 18A (Plate 2-8a)	799+00 to 848+00	83 feet	100-foot-wide seepage berm (+ potential relief wells) and/or cutoff wall	230 feet	175 feet
A:18B, 19A (Plate 2-8b)	848+00 to 863+00	70 feet	250-foot-wide seepage berm (+ potential relief wells) and/or cutoff wall	350 feet	326 feet
A:19A, 19B (Plate 2-8b)	863+00 to 878+00	58 feet	200–250-foot-wide seepage berm (+ potential relief wells) and/or cutoff wall	up to 344 feet	up to 286 feet
A:19B (Plates 2-8c through 2-8d)	878+00 to 923+50	52 feet to 83 feet	Cutoff wall and relief wells	80 feet to 103 feet	73 feet to 93 feet
A:19B, 20 (Plate 2-8d)	923+50 to 950+83	60 feet	Cutoff wall and relief wells	125 feet	65 feet

Source: Information from HDR in 2009; compiled by AECOM in 2009

- **Relief Wells.** Relief wells would be constructed in Reach A:16–20 in the O&M access corridor. Relief wells would also be constructed along some of the entrance channels to the landside pump stations. Relief wells would be spaced between 60–100 feet apart and would extend to depths of between 60–80 feet below the ground surface. Relief well discharge would be directed to existing City of Sacramento pumping stations by constructing a pipe system that is parallel to the existing City of Sacramento drainage pipe system, with periodic manhole covers for access. Alternatively, if capacity allows, relief well discharge would be routed directly into existing City of Sacramento drainage pipe systems. The relief well discharge would be contained in the existing O&M corridor.

- **Operation and Maintenance Access/Utility Corridors.** An O&M access corridor would be established adjacent to the toe of the levee or seepage berm. Beyond this corridor, where space is available, a corridor would be established for relocation of power lines and other utility infrastructure. **Plates 2-8a** through **2-8d** show the reach-by-reach configurations of O&M and utility corridors, including widths.

- **Maximum Limit of Flood Damage Reduction Improvements: Table 2-2** shows the proposed footprint of the levee improvements by reach and stationing. The adjacent levee and maximum limit of flood damage reduction improvements are shown on **Plates 2-7a** and **2-7b**, and cross-section dimensions are shown in **Plates 2-8a** through **2-8d**. This footprint is considered a worst-case scenario. Where feasible, the levee and seepage remediation improvements would stop short of existing rights-of-way, such as Wheelhouse Avenue, Marina Glen Way, Avocet Court/Swainson Way, and La Lima Way. However, these rights-of-way may

provide a portion of the O&M corridor for levee inspection and emergency flood fight activities. Installation of retaining walls, which may be employed to limit the landward extent of the footprint, could temporarily affect these roads. However, access to residences along these roads would be maintained during construction.

Construction of the proposed levee improvements would involve the following additional measures:

- **Garden Highway Closures.** In Reach A:16–19A, the landside lane of Garden Highway would be closed for up to 6 months to allow for construction of a cutoff wall. The closed portion of Garden Highway would shift along the levee crown as the cutoff wall is installed. Because of space constraints, in Sacramento River east levee A:Reach 19B–20, the landside lane of Garden Highway would be closed for up to 6 months to allow for construction of a cutoff wall. In addition, because there would be no room for a two-way haul route at the toe of the existing levee, the waterside lane of Garden Highway would be used by haul trucks delivering materials. This lane would only be open to local traffic, with use of traffic controls. Through traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. Garden Highway would be closed at several locations, including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B, to allow for installation of pipes that need to be raised.

- **Reconstruction of Intersections.** Garden Highway intersections at Orchard Lane and up to 20 additional private parcel ramps would require reconstruction to accommodate the adjacent levee. Where alternate access to the private properties is available, the private ramps would be removed and not replaced. The design would meet Sacramento County or City of Sacramento roadway design criteria, depending on the jurisdiction.

- **Measures to Reduce Impacts to Residences, Businesses, and Heritage Oaks.** Where residences, businesses, and heritage oak trees are located, measures would be employed to reduce the project footprint impacts to these resources, to the extent feasible given levee design and seepage-remediation performance requirements. These measures could include reducing the width of the adjacent levee, seepage berms, and O&M access and utility corridors; and strategically using cutoff walls, seepage relief wells, retaining walls, steeper landside levee slopes; and undergrounding utilities or shifting utilities to the waterside of the levee.

Plates 2-7a and **2-7b** show the Sacramento River east levee improvements in plan view, based on the adjacent levee width and maximum limit of flood damage reduction improvements shown in **Table 2-2**. **Plate 2-23a** shows the parcels within the footprint.

The levee improvements for the Phase 4b Project are anticipated to be constructed between April 15 and November 1. However, construction could extend as late as December 31. Some related activities, such as power pole relocations and demolition or relocation of residential or agricultural structures, may be conducted before April 15, and site restoration and demobilization could extend through January. The construction crew size during its peak would be up to 60 people per shift working two 12-hour shifts. The construction sequence would be divided into several different fronts to meet the proposed schedule. Cutoff wall construction in the generally rural reaches west of the I-80 overcrossing may be conducted 24/7. Sundays would be used to maintain the cutoff wall construction equipment. Cutoff wall construction in the urbanized area east of the I-80 overcrossing would be restricted to daytime hours.

Personnel, equipment, and imported materials would reach the project site primarily by Bryte Bend Road and an off-road haul route parallel to the existing landside levee toe in Reach A:16–20. However, secondary routes may include use of I-5, Powerline Road, El Centro Road, and San Juan Road. The primary corridors where construction activity would take place are off of public roadways, within and through the soil borrow areas and within the adjacent levee alignment and existing dirt roads used for access to the work areas.

Approximately 1,168,000 cubic yards of soil borrow would be required to construct these levee improvements. **Table 2-3** shows the quantity of each fill type needed and the expected source for the Adjacent Levee Alternative (Proposed Action). The levee fill, seepage berm fill, and excavation quantities include a 25% shrinkage factor to account for volume loss during excavation, placement, and compaction. The primary source for this material would be in the South Fisherman's Lake Borrow Area **(Plate 2-7a)**. The West Lakeside School Site **(Plate 2-17)**

would be a potential back-up borrow site. The average round-trip distance for truck hauls would be approximately 3.5 miles.

Table 2-3
Quantities of Fill Required for Sacramento River East Levee (Reach A:16–20) – Adjacent Levee Alternative (Proposed Action)

Material Type	Quantity	Source (Average Round-Trip Haul Distance)
Levee fill	505,000 cy	South Fisherman's Lake Borrow Area (4 miles)
Seepage berm fill	663,000 cy	South Fisherman's Lake Borrow Area (4 miles)
Waste material	—	On-site
Aggregate base	15,900 tons	Commercial source (30 miles)
Total	**1,168,000 cy / 15,900 tons**	**NA**

Notes: cy. = cubic yards; NA = not applicable
Source: Data provided by HDR in 2009

Delivery of the materials listed in **Table 2-3** would require up to 900 haul trips per day. Construction in Reach A:16–19A **(Plate 2-7a)** would require an average of 540 truck trips per day based on the following assumptions: (1) construction would take place within a 6-month period, with 140 days available during the 156-day construction season (April 1–November 1), (2) truck capacities would be 14 cubic yards (24 tons), and (3) haul trucks would be used for moving all borrow material from borrow sites. Use of haul trucks for all trips is a conservative assumption because some of these trips could take place off road and may involve the use of elevating scrapers rather than haul trucks.

For construction in Reach A:19B–20 **(Plate 2-7b)**, an average of 360 truck trips per day would be required, based on the assumption that hauling would take place over a 45-day period using street-legal haul trucks with a 12 cubic yard capacity (20 tons). Lighter haul trucks would be employed in these reaches because of the increased need to use surface streets in these reaches as a result of limited space for two-way truck traffic along the landside levee toe.

The primary haul route from the South Fisherman's Lake Borrow Area would be Bryte Bend Road and an off-road haul route parallel to the existing landside levee toe in Reach A:16–20. Short sections of Powerline Road, El Centro Road, San Juan Road, West El Camino Avenue, and Gateway Oaks Drive may be used for some trips **(Plate 2-6)**. Hauling from West Lakeside School Site would also use off-road haul routes. For Reach A:19B–20, a single lane of Garden Highway from approximately Marina Glen Way to Northgate Boulevard may be used for return trips for haul trucks because landside space may be too limited to provide a two-lane off-road haul route. In this case, use of street-legal haul trucks would be required. Approximately 15,900 tons of aggregate base would be hauled from commercial sources up to 30 miles away, with 10,500 tons to be used in Reach A:16–19A and 5,400 tons to be used in Reach A:19B–20.

Table 2-4 summarizes the types of equipment that may be used throughout the construction sequence, along with an approximation of the duration of each activity.

Table 2-4
Anticipated Equipment Types and Duration of Use for Sacramento River East Levee Reach A:16–20 – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
Mobilization	NA	NA
Site preparation (tree removal, clearing, grubbing, stripping)	Scrapers (6)	27
	Front-end loaders (2)	27
	Crawler/tractors (tree pushers) (2)	27
	Water trucks (2)	27
	Motor graders (2)	27
	Chippers/grinders (4)	27
	Haul trucks (10)	27
Removal of landside structures and other facilities	Excavators (2)	24
	Haul trucks (24)	24
	Front-end loaders (1)	24
Construction of adjacent levee and seepage berms (includes borrow site activities)	Scrapers (5)	140
	Excavators (5)	140
	Front-end loaders (5)	140
	Haul trucks (14 cy) (50)	140
	Bulldozers (5)	140
	Sheepsfoot compactors (2)	140
	Motor graders (2)	140
	Water trucks (2)	140
Cutoff wall construction	Front-end loaders (10)	60
	Bulldozers (20)	60
	Extended-boom pallet loaders (10)	60
	300-kW generators (10)	60
	Slurry pumps (10)	60
	Pickup trucks (8)	60
	Haul trucks (8)	60
	Excavators (6)	60
	Deep soil mix rigs (10)	60
Reconstruction of Garden Highway at intersections	Backhoes (1)	27
	Smooth drum compactors (1)	27
	Asphalt pavers (1)	27
	Haul trucks (3)	27
	Striping trucks (1)	27
	Truck-mounted augers (1)	27
Site restoration and demobilization	Hydroseeding trucks (3)	34
	Water trucks (3)	34
	Haul trucks (2)	34

Notes: cy = cubic yards; kW = kilowatt; NA = not applicable
Source: Data provided by HDR in 2009

The sequence of construction activities would be as follows:

- **Landside Vegetation Removal:** Along the landside of the Sacramento River east levee in Reach A:16–20, approximately 26 acres of vegetation would be removed as needed from the levee improvement footprint, which is a minimum of 15 feet from the levee or seepage berm toe. Vegetation would also be cleared from O&M and utility corridors, as needed. This operation would require removal of some trees and relocation/removal of elderberry shrubs, which occur mostly adjacent to existing roads. Small trees and

elderberry shrubs, where feasible, would be relocated to woodland preservation areas that are part of the Phase 4b Project. A minimal amount of below-ground disturbance would occur.

- **Waterside Vegetation Removal:** No waterside vegetation would need to be removed as part of the levee improvements in Reach A:16–20 of the Sacramento River east levee. In terms of compliance with USACE levee vegetation guidance, it is assumed that, with a variance, construction of an adjacent levee (the Adjacent Levee Alternative [Proposed Action]) would allow the levee to meet USACE vegetation guidance criteria without removal of waterside vegetation.

- **Utilities Relocation:** All utilities (water, sewer, communication, and electrical, including power poles) that currently exist on the landside slope of the levee and at the landside levee toe would need to be relocated and/or rerouted to accommodate the widened levee footprint. A Pacific Gas and Electric (PG&E) Company tower (Reach A:18A, at approximately Station 847+00) is located within the proposed 250-foot-wide seepage berm. The tower would potentially need to be relocated outside of the levee footprint, but all efforts would be made to protect it in place. To the extent feasible, mainline utility infrastructure, such as power poles, would be relocated beyond the landside levee, with the potential of undergrounding some utilities as an option. Should placement of poles be required on top of the seepage berms, raised foundations would be constructed to prevent the poles from penetrating the top of the seepage berm. In Reach A:19A–19B (from Station 863+00 to 923+00), where space on the landside is limited, some utility poles may need to be relocated to the waterside of the existing levee; however, no new power poles would be located on the waterside of the levee in the vicinity of existing waterside residences unless there is no feasible alternative for providing service to these residences. No power poles would be relocated within the new levee prism. Tree pruning would likely be required in some locations to accommodate the power poles and associated wires. The project proponent(s) would conduct the relocations in coordination with the appropriate utility companies and the construction operations.

- **Construction Mobilization:** Mobilization would include setting up construction offices and transporting heavy construction equipment to the work site, and would also include preparation of the borrow sites. The main construction staging areas would be located on a city-owned parcel (Costa Park site) immediately east of the I-80 overcrossing (**Plate 2-7a**). The area would be used for the contractor's and engineer's construction trailers, parking for personnel, storage for machine maintenance tool and parts, water trucks, and storage of fuels and other materials to be used for construction.

- **Site Preparation (Clearing, Grubbing, and Stripping) at the Levee:** Site preparation at the levee would begin with clearing structures and woody vegetation from the landside slope of the existing levee, the footprint of the adjacent setback levee, the seepage berm, and the permanent O&M access and utility corridors. The clearing operation would be followed by grubbing operations to remove stumps, root balls, and below ground infrastructure. This operation would be followed by stripping the top 12 inches of earthen material from the landside slope of the existing levee and the footprint of the adjacent setback levee and seepage berm (unless there are identified cultural artifacts, in which case the area would be mowed and special construction methods would be used to minimize impacts). Excess earthen materials (organic soils and grass from the adjacent levee foundation and excavated material that does not meet levee embankment criteria) would be respread on the surface of the new levee slopes and seepage berms. Debris generated during the clearing and grubbing operations would be hauled off-site to landfills, concrete recycling plants, or cogeneration facilities.

- **Site Preparation (Clearing, Grubbing, and Stripping) at the Borrow Sites:** Site preparation at the borrow sites would begin with clearing structures and woody vegetation from the borrow area. The clearing operation would be followed by grubbing operations to remove stumps, root balls, and below-ground infrastructure. The borrow area would then be disced to chop surface vegetation and mix it with the near-surface organic soils. The discing operation would be followed by stripping the top 12 inches of earthen material from the borrow excavation area and stockpiling this soil at the borrow site. These soils would be respread on the surface of the borrow site following completion of the borrow excavation and grading. Debris generated

during the clearing and grubbing operations would be hauled off-site to landfills, concrete recycling plants, or cogeneration facilities.

- **Removal or Modification of Landside Structures and Other Facilities:** An estimated 15–20 residential and other agricultural structures are located within the footprint of the levee improvements. These structures, and the facilities supporting them, would have to be modified, removed, or relocated out of the project footprint before the start of levee construction in those areas. Irrigation facility conveyance, distribution boxes, wells, and standpipes within the footprint of the project features would be demolished and replaced as needed. Debris from structure demolition, power poles, utility lines, piping, and other materials requiring disposal would be hauled off-site to a suitable landfill. Demolished concrete could be sent to a concrete recycling facility. Wells and septic systems would be abandoned in accordance with the applicable state and county requirements. Existing utilities, pipelines, and appurtenant structures located at the toe of the existing levee will need to be relocated outside of the project footprint. Utilities may include, but not be limited to, water, sewer, and electrical mains servicing both the landside and waterside residential and commercial structures.

- **Construction of Adjacent Levee, Cutoff Walls, and Seepage Berms:** Borrow material from the potential borrow sites would be delivered to the levee construction sites using haul trucks or scrapers where it would be spread by motor graders and compacted by sheepsfoot rollers to build the adjacent levee and seepage berms. In areas of cutoff wall construction, the adjacent levee would initially be built up to approximately 5 feet above existing grade at the toe of the levee to create a working platform. Construction of the cutoff wall downstream of Powerline Road may require closure of one lane of Garden Highway, with one-way traffic maintained to provide access to properties along the work area. Additional material from borrow sites would then be delivered to the project site for construction of the remainder of the adjacent levee and the seepage berms.

- **Installation of Relief Wells:** Where needed, relief wells would be constructed using techniques typically used for drilling water wells. A drill rig would bore a hole into the ground to the required depth of the well, the well casing and well screen sections would be installed, and then the well would be finished by pumping water from it to clean out the bentonite drilling fluid and to consolidate the well's gravel pack. After the solids are settled out, water from the well development operations would be discharged to adjacent fields or drainage ditches.

- **Traffic Control during Construction:** Single-lane traffic control and detours would be required while constructing cutoff walls, reconstructing the landside lane of Garden Highway. Examples of traffic control measures to be considered include use of flaggers to maintain alternating one-way traffic while roadway and utility facility work is proceeding on one-half of the roadway/intersection, use of advance construction signs and other public notices to alert drivers of activity in the area, and use of "positive guidance" detour signing on alternate access roads to reduce inconvenience to the driving public. If detours are required for through traffic, local traffic would be allowed, subject to delays during critical construction operations. Concrete barriers (K-Rail) would be used to separate traffic from the cutoff wall work areas. A moving segment of one lane of Garden Highway would be closed during the entire construction season—up to 6 months. Through traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard.

- **Reconstruction of Garden Highway:** Where cutoff wall construction occurs through the crown of the adjacent levee, some reconstruction work on Garden Highway would be required to restore the landside lane of the roadway. Garden Highway intersections at major roadway ramps would require degrading, rebuilding the embankment, and repaving to accommodate the installation of the cutoff wall and slope flattening. Traffic control and detours would be required during this phase of construction.

- **Site Restoration and Demobilization:** Upon completion of construction activities, the stripped material would be placed on top of the completed seepage berms, and both the levee slopes and the tops of the seepage berms would be hydroseeded. An aggregate base patrol road would be constructed on the crown of the new

levee and on the landside edge of the seepage berm. Any construction debris would be hauled to an appropriate waste facility. Equipment and materials would be removed from the site, and staging areas and any temporary access roads would be restored to preproject conditions. Demobilization would likely occur in various locations as construction proceeds along the project alignment.

- **Postconstruction Site Conditions.** Following construction, the levee slopes, seepage berms, maintenance access rights-of-way, and any previously vegetated areas disturbed during construction would be seeded with a grass mix that meets DFG criteria. To the extent that they do not interfere with flood control inspection and operations, maintenance practices for the areas of grassland cover within the footprint of the levee facilities would be conducted to promote the value of these areas as foraging habitat for Swainson's hawk.

Sacramento River East Levee (Reach B:10–15) – Extension of Levee Raise

The Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f) analyzed a raised adjacent levee from Reach B:10 through Reach B:12A, with 7–10 waterside drainage outfalls planned north of Powerline Road to drain stormwater to the waterside of the levee. Subsequent engineering analysis indicates that additional levee raising is needed in Reach B:12A–13 to meet height requirements, with the proposed raise extending an additional 4,500 feet, from approximately Station 635+00 to Station 680+00 (see **Plate 2-7a** [inset]). This levee raise extension would be constructed within the previously analyzed (and SAFCA-approved) Phase 4a Project footprint.

From Station 635+00 to Station 662+00, the levee raise would be accomplished by extending the raised adjacent levee for approximately 2,700 feet. From Station 662+00 to Station 680+00, rather than an adjacent levee raise, the existing top of levee, where Garden Highway is located, would be raised in place. The portion of the levee raise from Station 662+00 to Station 680+00 would be constructed as part of the Phase 4b Project; however, as part of the Phase 4a Project, SAFCA would construct from Station 635+00 to Station 662+00 a levee embankment wide enough to accommodate the Phase 4b Project raise through this reach.

The extension of the adjacent levee raise would not require additional waterside drainage outfalls beyond the range 7 to 10 outfalls that was analyzed as part of the Phase 4a EIS and EIR. Therefore, no increase in vegetation removal (estimated 0.5 acres) or additional impacts to water quality would result from these design changes compared to what was analyzed in the Phase 4a EIS and EIR. However, because of the extra length of the highway drainage swale, the spacing of the waterside drainage outfalls would increase. For the extension of the adjacent levee raise from Station 635+00 to 662+00 as part of the Phase 4a Project, one of the outlets would need to be located south of Powerline Road. No additional Garden Highway closures would result from construction of the proposed design modifications. A temporary access road would be provided for the levee segment that would be raised in place (Station 662+00 to Station 680+00). Access to waterside residences in this reach would be maintained at all times.

American River North Levee

Levee improvements would be constructed from Gateway Oaks Drive to Northgate Boulevard, a distance of approximately 2.3 miles. They would include the following components:

- **Levee Slope Flattening.** A new levee slope (3H:1V) would be constructed adjoining the existing American River north levee from Station 0+00 to Station 115+71 (Reach I:1–4) **(Plate 2-9)**. The levee typical dimensions are shown in **Plates 2-10a** and **2-10b**. The existing levee already meets height requirements; therefore, the top of the new levee would be no higher than the elevation of the existing levee crown, except at locations where pumping plant discharge pipelines or other utilities must be raised.

- **Cutoff Walls.** Three-foot-wide cutoff walls made of SB, CB, or SCB would be installed either through the existing levee or along the landside toe of the existing levee. Depending on the construction method used, the top of the cutoff walls would be at least 5 feet above existing ground surface (within either the new adjacent setback levee or existing levee) and extend to a depth of 110 feet below ground surface in some areas.

Locations and depths would be determined during engineering design. The total linear extent would be up to 12,000 feet.

- **Seepage Berms.** Seepage berms are not a proposed remediation feature for the American River north levee.
- **Relief Wells.** Relief wells are not a proposed remediation feature for the American River north levee.
- **O&M Access/Utility Corridors.** A 15–30-foot-wide O&M corridor would be established adjacent to the toe of the levee. A 10-foot-wide utility corridor would be located off the landside toe. However, if space is not available, the utility corridor would be adjusted to fit within the available space.
- **Measures to Reduce Impacts to Heritage Oaks.** Where heritage oak trees are located, measures would be employed to reduce the project footprint impacts to these resources, to the extent feasible given levee design and seepage-remediation performance requirements. These measures could include reducing the width of the levee expansion and O&M access and utility corridors, using retaining walls, and potentially undergrounding utilities, where feasible.
- **Garden Highway Closures.** For levee improvements along the American River north levee, Garden Highway/Arden-Garden Connector would be completely closed for up to 6 months between I-5 and Northgate Boulevard. Through-traffic would be detoured to West El Camino Avenue, SR 160, Richards Boulevard, Truxel Road, and Northgate Boulevard. Garden Highway would be closed at several locations, including City of Sacramento Pump 58, to allow for installation of pipes that need to be raised.
- **Reconstruction of Intersections.** Garden Highway intersections at Natomas Park Drive, Truxel Road, Arden-Garden Connector, Northgate Boulevard, and four additional private parcel ramps would require degrading, rebuilding the embankment, and repaving to accommodate the installation of the cutoff wall and slope flattening. The ramps would be reconstructed to the current general ramp and intersection geometry. Where alternate access to the private properties is available, the private ramps would be removed and not replaced. The intersection design would meet City of Sacramento roadway design criteria.

Plate 2-9 shows the levee improvements in plan view. **Plate 2-23a** shows the parcels within the footprint. The width of the real estate acquisition and/or easements would vary between 83 feet and 110 feet from the baseline centerline of the existing levee (up to about 50 feet from the toe of the existing levee in most reaches) (see **Plates 2-10a** and **2-10b** for profile views). In Reach 1:2–4, the maximum extent of levee improvements, including the O&M corridor, would end at established property lines.

Approximately 167,000 cubic yards of soil borrow would be required to construct these levee improvements. **Table 2-5** shows the quantity of each fill type needed and the expected source for the Adjacent Levee Alternative (Proposed Action). Fill quantities include a 25% shrinkage factor to account for volume loss during excavation, placement, and compaction. The primary source for this material would be in the South Fisherman's Lake Borrow Area (**Plate 2-7a**). The West Lakeside School Site (**Plate 2-17**) would be a potential back-up borrow site. The average round-trip distance for truck hauls would be approximately 5 miles.

Delivery of the materials listed in **Table 2-5** would require about 120 haul trips per day. These estimates are based on the following assumptions: (1) construction would take place within a 6-month period, with 140 days available during the 156-day construction season (April 1–November 1), (2) truck capacities would be 14 cubic yards (24 tons), and (3) haul trucks would be used for moving all borrow material from the borrow sites. The use of elevating scrapers rather than haul trucks is not possible for the American River north levee improvements. The primary haul route from the South Fisherman's Lake Borrow Area would be Bryte Bend Road. Secondary haul routes may make use of short sections of El Centro Road, San Juan Road, West El Camino Avenue, Natomas Park Drive, Truxel Road, and Northgate Boulevard (**Plate 2-6**). Garden Highway from approximately Marina Glen Way to Northgate Boulevard may be used for return trips for haul trucks because landside space may be too limited to provide a two-lane off-road haul route. Approximately 8,700 tons of aggregate base and approximately

Table 2-5
Quantities of Fill Required for the American River North Levee (Reach I:1–4) – Adjacent Levee Alternative (Proposed Action)

Material Type	Quantity	Source (Average Round-Trip Haul Distance)
Levee fill	167,000 cy	South Fisherman's Lake Borrow Area (5 miles)
Waste material	27,000 cy	On-site
Aggregate base	8,700 tons	Commercial source (30 miles)
Asphalt concrete	1,500 tons	Commercial source (30 miles)
Total	**167,000 cy / 10,200 tons**	

Notes: cy = cubic yards
Source: Data provided by HDR in 2009

1,500 tons of asphalt concrete would be hauled from commercial sources up to 30 miles away. Personnel, equipment, and imported materials would reach the project sites via I-5, Truxel Road, Gateway Oaks Drive, Northgate Boulevard, and Arden-Garden Connector (**Plate 2-6**).

The levee improvements on the American River north levee are anticipated to be constructed between April 15 and November 1. However, construction could extend as late as December 31. Some related activities, such as power pole relocations and demolition or relocation of residential or agricultural structures, may be conducted before April 15, and site restoration and demobilization could extend through January. The construction crew size during its peak is estimated at 60 people per shift working two 12-hour shifts. The construction sequence would be divided into several different headings to meet the proposed schedule.

Table 2-6 summarizes the types of equipment that may be used throughout the construction sequence under the Adjacent Levee Alternative (Proposed Action), along with an approximation of the duration of each activity.

The sequence of construction activities would be as follows:

- **Landside Vegetation Removal:** Along the landside of the American River north levee (Reach I:1–4), approximately 7 acres of vegetation would be removed as needed from the levee improvement footprint, which would be a minimum of 15 feet from the widened levee or new seepage berm toe. The 20-foot-wide proposed utility corridor would also require vegetation removal. This operation would require removal of some trees and relocation/removal of elderberry shrubs, which occur mostly adjacent to existing roads. Small trees and elderberry shrubs, where feasible, would be relocated to woodland preservation corridors that are part of the Phase 4b Project. A minimal amount of below ground disturbance would occur. Because the American River north levee is already relatively wide, and the proposed slope flattening would widen its footprint further, it is expected that vegetation clearing would likely not be required on the waterside of the levee.
- **Waterside Vegetation Removal:** No waterside vegetation would be removed as part of improvements to the American River north levee. In terms of compliance with USACE levee vegetation guidance, the levee (including the section between Northgate Boulevard and the Arden-Garden Connector) may qualify for a variance because it was widened to support construction of the Garden Highway. However, in the event the variance were not granted, it is assumed that the upper two-thirds of the waterside slope would be cleared, resulting in the removal of up to 6 acres of waterside vegetation in a worst-case scenario.

Table 2-6
Anticipated Equipment Types and Duration of Use for Improvements to American River North Levee – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
Mobilization	–	27
Site preparation (tree removal, clearing, grubbing, stripping)	Scrapers (2)	27
	Front-end loaders (2)	27
	Crawler/tractors (tree pushers) (2)	27
	Water trucks (1)	27
	Motor graders (2)	27
	Chippers/grinders (4)	27
	Haul trucks (6)	27
Removal of landside structures and other facilities	Excavators (2)	24
	Haul trucks (8)	24
	Front-end loaders (1)	24
Flattening slope (includes borrow site activities)	Scrapers (2)	140
	Excavators (2)	140
	Front-end loaders (2)	140
	Haul trucks (14 cy) (10)	140
	Bulldozers (2)	140
	Sheepsfoot compactors (2)	140
	Motor graders (2)	140
	Water trucks (1)	140
Cutoff wall construction	Front-end loaders (6)	60
	Bulldozers (12)	60
	Extended-boom pallet loaders (6)	60
	300-kW generators (6)	60
	Slurry pumps (6)	60
	Pickup trucks (6)	60
	Haul trucks (2)	60
	Excavators (2)	60
	Deep soil mix rigs (6)	60
Reconstruction of Garden Highway at four intersections	Backhoes (4)	27
	Smooth drum compactors (4)	27
	Asphalt pavers (2)	27
	Haul trucks (12)	27
	Striping trucks (2)	27
	Truck-mounted augers (2)	27
Site restoration and demobilization	Hydroseeding trucks (3)	34
	Water trucks (3)	34
	Haul trucks (3)	34

Notes: cy = cubic yards; kW = kilowatt
Source: Data provided by HDR in 2009

- **Utilities Relocation:** All utilities (water, sewer, communication, and electrical, including power poles) that currently exist on the landside slope of the levee and at the landside levee toe would need to be relocated and/or rerouted to accommodate the widened levee footprint. To the extent feasible, mainline utility infrastructure, such as power poles, would be relocated beyond the landside levee toe, with the potential option of undergrounding some utilities. Some poles may need to be relocated to the waterside of the existing levee. Tree pruning would likely be required in some locations to accommodate the power poles and associated wires. SAFCA would conduct the relocations in coordination with the appropriate utility companies and the construction operations.

- **Construction Mobilization:** Mobilization would include setting up construction offices and transporting heavy construction equipment to the work site, and would also include preparation of the borrow sites. The main construction staging area would be located adjacent to the working area along the existing Garden Highway alignment and within Discovery Park (**Plate 2-9**). The area would be used for the contractor's and engineer's construction trailers, parking for personnel, storage for machine maintenance tool and parts, water trucks, and storage of fuels and other materials to be used for construction.

- **Site Preparation (Clearing, Grubbing, and Stripping) at the Levee:** Site preparation at the levee would begin with clearing structures and woody vegetation from the landside slope of the existing levee, the footprint of the adjacent setback levee, and the permanent O&M access and utility corridors. The clearing operation would be followed by grubbing operations to remove stumps, root balls, and below-ground infrastructure. This operation would be followed by stripping the top 12 inches of earthen material from the landside slope of the existing levee and the footprint of the adjacent setback levee (unless there are identified cultural artifacts, in which case the area would be mowed and special construction methods would be used to minimize impacts). Excess earthen materials (organic soils and grass from the adjacent levee foundation and excavated material that does not meet levee embankment criteria) would be respread on the surface of the new levee slopes. Debris generated during the clearing and grubbing operations would be hauled off-site to landfills, concrete recycling plants, or cogeneration facilities.

- **Site Preparation (Clearing, Grubbing, and Stripping) at the Borrow Sites:** Site preparation at the borrow sites would begin with clearing structures and woody vegetation from the borrow area. The clearing operation would be followed by grubbing operations to remove stumps, root balls, and below ground infrastructure. The borrow area would then be disced to chop surface vegetation and mix it with the near-surface organic soils. The discing operation would be followed by stripping the top 12 inches of earthen material from the borrow excavation area and stockpiling this soil at the borrow site. These soils would be respread on the surface of the borrow site following completion of the borrow excavation and grading. Debris generated during the clearing and grubbing operations would be hauled off-site to landfills, concrete recycling plants, or cogeneration facilities.

- **Removal or Modification of Landside Structures and Other Facilities:** Multiple facilities or structures would have to be modified, removed, or relocated out of the project footprint before the start of levee construction in those areas. Utility facilities within the footprint of the project features would be demolished and replaced as needed. Debris from structure demolition, power poles, utility lines, piping, and other materials requiring disposal would be hauled off-site to a suitable landfill. Demolished concrete could be sent to a concrete recycling facility. Wells and septic systems would be abandoned in accordance with the applicable state and county requirements.

- **Construction of Slope Flattening Levee and Cutoff Walls:** Borrow material from the potential borrow sites would be delivered to the levee construction sites using haul trucks where it would be spread by motor graders and compacted by sheepsfoot rollers to build the slope flattening levee. In areas of cutoff wall construction, the slope flattening levee would initially be built up to approximately 5 feet above existing grade at the toe of the levee to create a working platform. Construction of the cutoff wall downstream of Gateway Oaks Drive may require closure of one lane of Garden Highway, with one-way traffic maintained to provide access to properties along the work area.

- **Traffic Control during Construction:** Single-lane traffic control and detours would be required while constructing cutoff walls and reconstructing Garden Highway. Examples of traffic control measures to be considered include use of flaggers to maintain alternating one-way traffic while roadway and drainage facility work is proceeding on one-half of the roadway/intersection, use of advance construction signs and other public notices to alert drivers of activity in the area, and use of "positive guidance" detour signing on alternate access roads to reduce inconvenience to the driving public. If detours are required for through-traffic, local traffic would be allowed, subject to delays during critical construction operations. Concrete barriers (K-Rail) would be used to separate traffic from the cutoff wall work areas. A moving segment of the landside lane of Garden Highway would be closed during the entire construction season—up to 6 months.

- **Reconstruction of Garden Highway:** Where cutoff wall construction occurs through the crown of the levee, some reconstruction work of Garden Highway would be required to restore the landside lane of the roadway. Garden Highway intersections at major roadway ramps would require degrading, rebuilding the embankment, and repaving to accommodate the installation of the cutoff wall and slope flattening. Traffic control and detours would be required during this phase of construction. Garden Highway reconstruction would be conducted in compliance with applicable county road standards.

- **Site Restoration and Demobilization:** Upon completion of construction activities, the levee slopes and other disturbed areas would be hydroseeded. Any construction debris would be hauled to an appropriate waste facility. Equipment and materials would be removed from the site, and staging areas and any temporary access roads would be restored to preproject conditions. Demobilization would likely occur in various locations as construction proceeds along the project alignment.

- **Postconstruction Site Conditions:** Following construction, the levee slopes, maintenance access rights-of-way, and any previously vegetated areas disturbed during construction would be seeded with a grass mix that meets DFG criteria. To the extent that they do not interfere with flood control inspection and operations, maintenance practices for the areas of grassland cover within the footprint of the levee facilities would be conducted to promote the value of these areas as foraging habitat for Swainson's hawk.

Natomas East Main Drainage Canal West Levee – Northern Segment

Work along the northern segment of the NEMDC west levee (NEMDC North [Reaches F–G]), located between Elkhorn Boulevard and Sankey Road, would include levee raising, landside slope flattening, and cutoff wall construction (**Plate 2-11**). The total length of this levee segment is 35,690 linear feet. Natomas Road and East Levee Road are located on top of the levee.

The levee height is insufficient from Elkhorn Boulevard to a point approximately 1 mile upstream of Elverta Road. Through this area, the levee would be raised between 1–2 feet. The levee raise would be accomplished by one of two methods:

1) Constructing either a strengthen-in-place levee raise, where the levee is raised by projecting the waterside slope up at a 3H:1V slope to its ultimate height, providing a width necessary to reconstruct the existing Natomas Road/East Levee Road on top of the new levee, and projecting the landside slope back down to existing grade at a 3H:1V slope (**Plate 2-12**, upper illustration); or

2) Leaving Natomas Road/East Levee Road in place and constructing an adjacent levee next to the existing levee to the height required for the appropriate levee height (**Plate 2-12**, lower illustration).

The preferred method would be determined based upon engineering alternatives analyses of the two options. Where levee raising is not required, the levee would be widened landward to provide a theoretical 3H:1V waterside slope, a minimum 20-foot-wide levee crest, and a 3H:1V landside slope. If the levee is strengthened in place, Natomas Road/East Levee Road would be closed to through-traffic for up to 6 months. **Plate 2-11** shows the maximum limit of flood damage reduction improvements that would occur under either option.

Vegetation would be removed as needed from the levee improvement footprint, which is a minimum of 15 feet from the levee or seepage berm toe. The 20-foot-wide proposed utility corridor would also require vegetation removal (see **Plate 2-12**). Power poles that currently exist on the landside slope of the levee and at the landside levee toe would need to be relocated and/or rerouted to accommodate the widened levee footprint. **Plate 2-12** shows the location of the proposed 15-foot-wide utility corridor.

To mitigate for levee underseepage, cutoff walls totaling up to 22,000 linear feet would be constructed 24/7 along the NEMDC North west levee to a depth of up to 80 feet. For an adjacent or widened levee, the cutoff wall would be constructed by placing compacted levee fill to create a cutoff wall working platform at the landside toe of the levee. The platform would be within the prism of the finished widened or adjacent levee, at a height 3–5 feet above the existing grade. For a strengthen-in-place option, the cutoff wall would be constructed at the existing levee centerline, following a one-half degrade of the existing levee. For either option, the cutoff wall would be a SB cutoff wall constructed by the conventional, long-reach excavator method. Once the cutoff wall is constructed and has consolidated, the remaining levee fill would be placed over the cutoff wall and the levee constructed to its final grade. For the full length of the west levee of NEMDC North, the project proponent(s) would acquire easements at least 30 feet wide for levee maintenance and 15 feet wide for existing and future utilities.

The crew size for this phase of the Adjacent Levee Alternative (Proposed Action) during its peak is estimated at 45–55 people working on three fronts, two 12-hour shifts, 6 days a week. Sundays would primarily be used for equipment maintenance. **Table 2-7** lists the anticipated major materials quantities associated with both engineering options. The potential sources of fill material for this work would be the Triangle Properties Borrow Area (**Plate 2-13**) and the Krumenacher borrow site (**Plate 2-14**). Up to 810 truck trips per day would be required to move this material from borrow sites to construction sites. Aggregate material would come from commercial sources up to 30 miles away.

Table 2-7
Anticipated Major Materials Quantities for Natomas East Main Drainage Canal North Cutoff Wall and Levee Widening/Raising Work – Adjacent Levee Alternative (Proposed Action)

Description	Strengthen-in-Place Option	Adjacent Levee Option
Borrow site excavation	830,000 cy	965,000 cy
Levee embankment degrade	240,000 cy	0 cy
Levee embankment fill	1,025,000 cy	965,000 cy
SB cutoff wall	980,000 sf	1,005,000 sf
Class 2 aggregate surfacing	70,000 tons	27,000 tons
Asphalt concrete paving	22,250 tons	0 tons

Notes: cy = cubic yards; sf = square feet
Source: Data provided by Wood Rodgers in 2009

Table 2-8 lists the anticipated equipment and construction durations for this work.

Table 2-8
Anticipated Equipment and Duration for Natomas East Main Drainage Canal North Cutoff Wall and Levee Widening/Raising Work – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Clearing and grubbing/stripping	Elevating scrapers (8)	10
	Water trucks (2)	10
	Front-end loaders (4)	10
	Pickup trucks (5)	10
2. Borrow site preparation (concurrent with no. 1)	Water truck (1)	20
	Scrapers (2)	20
	Tractors with discing equipment (2)	20
3. Working surface construction (follows no. 2)	Water trucks (3)	20
	Vibratory rollers (5)	20
	Scrapers (15)	20
	Excavators (3)	20
4. Cutoff wall construction (follows no. 3)	Hydraulic excavators (6)	85
	Front-end loaders (3)	85
	Extended boom pallet loader (1)	85
	300 kW generators (2)	85
	Slurry pumps (2)	85
	Pickup trucks (5)	85
	Haul trucks (3)	85
	Water trucks (2)	85
5. Levee raising/widening (lags no. 4 by 21 days)	Water trucks (3)	90
	Vibratory rollers (5)	90
	Scrapers (20)	90
	Haul trucks (15)	90
	Motor graders (2)	90
6. Demobilization/cleanup (follows no. 5)	Hydroseeding trucks (2)	12
	Extended boom pallet loader (1)	12
	Haul trucks (2)	12

Note: kW = kilowatt
Source: Data provided by Wood Rodgers in 2009

Pleasant Grove Creek Canal and Natomas East Main Drainage Canal South – West Levee Raise

The Phase 3 EIS and EIR disclosed and analyzed levee improvements at the PGCC west levee (levee raising, slope flattening, levee widening, and installation of a cutoff wall) and southern segment of the NEMDC west levee (installation of a cutoff wall). The Adjacent Levee Alternative (Proposed Action) would build on these improvements and increase the level of flood risk reduction by raising (1–1.5 feet) the west levee of the PGCC and an approximately 500-foot-long section of the west levee of NEMDC South (Reach H) extending south of Elkhorn Boulevard from Station 313+00 to 318+50) to provide 3 feet of levee height (**Plates 2-13** and **2-14**). **Plates 2-13** and **2-14** also show the footprint analyzed as part of the Phase 3 Project. The Phase 4b Project analyzes only the increment change in the footprint and additional material required for construction.

The levee raise would be accomplished by one of two options:

1) Constructing either a strengthen-in-place levee raise, where the levee is raised by projecting the waterside slope up at a 3H:1V slope to its ultimate height, providing a width necessary to reconstruct the existing East Levee Road on top of the new levee, and projecting the landside slope back down to existing grade at a 3H:1V slope (**Plate 2-15**, upper illustration); or

2) Leaving East Levee Road in place and constructing an adjacent levee next to the existing levee (**Plate 2-15**, lower illustration).

The preferred method would be determined based upon further detailed engineering alternatives analyses of the two options.

Vegetation would be removed as needed from the levee improvement footprint, which is a minimum of 15 feet from the levee or seepage berm toe. The 20- to 50-foot-wide proposed utility corridor would also require vegetation removal (see **Plate 2-15**). Power poles that currently exist on the landside slope of the levee and at the landside levee toe would need to be relocated and/or rerouted to accommodate the widened levee footprint. **Plate 2-15** shows the location of the proposed 15- to 20-foot-wide utility corridor.

Table 2-9 lists the total anticipated major materials quantities associated with this work. The primary source of the fill material for work on the PGCC would be the Triangle Area Properties Borrow Area (**Plate 2-13**). The primary source of the fill material for work on the NEMDC South would be the Krumenacher Borrow Site and the Twin Rivers Unified School District Stockpile Site (**Plate 2-14**). Up to 566 truck trips per day would be required to move this material from borrow sites to construction sites. Aggregate material would come from commercial sources up to 30 miles away.

Table 2-9
Anticipated Major Materials Quantities for Pleasant Grove Creek Canal West Levee Raise and Natomas East Main Drainage Canal West Levee Raise – Adjacent Levee Alternative (Proposed Action)

Description	Strengthen-In-Place Option	Adjacent Levee Option
Borrow site excavation	109,000 cy	345,500 cy
Levee embankment fill	87,000 cy	290,000 cy
Class 2 aggregate surfacing	48,300 tons	340 tons
Asphalt concrete paving	11,190 tons	40 tons

Note: cy = cubic yards
Source: Data provided by Wood Rodgers in 2009

Table 2-10 lists the anticipated equipment and construction durations for this work.

Table 2-10
Anticipated Equipment and Duration for Pleasant Grove Creek Canal West Levee Raise and Natomas East Main Drainage Canal West Levee Raise – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Clearing and grubbing/stripping	Elevating scrapers (4)	10
	Water trucks (2)	10
	Front-end loaders (2)	10
	Haul trucks (15)	10
	Pickup trucks (5)	10
2. Borrow site preparation (concurrent with no. 1)	Tractors with scrapers (2)	5
	Water truck (1)	5
3. Levee embankment placement (follows no. 1 and 2)	Elevating scrapers (16)	80
	Hydraulic excavators (2)	80
	Front-end loaders (2)	80
	Pickup trucks (5)	80
	Haul trucks (3)	80
4. East Levee Road/Natomas Road reconstruction (follows no. 3)	Water trucks (2)	30
	Smooth drum rollers (8)	30
	Asphalt concrete pavers (5)	30
	Asphalt delivery trucks (50)	30
5. Cleanup/demobilization (follows no. 4)	Water trucks (2)	12
	Hydroseeding trucks (2)	12
	Extended boom pallet loader (1)	12
	Haul trucks (2)	12

Source: Data provided by Wood Rodgers in 2009

The crew size for this phase of the Adjacent Levee Alternative (Proposed Action) during its peak is estimated at 45–55 people working two 12-hour shifts, 6 days a week. Sundays would primarily be used for equipment maintenance.

Pleasant Grove Creek Canal and Natomas East Main Drainage Canal South Waterside Improvements

Several areas along the waterside slope of the PGCC and NEMDC South (Elkhorn Boulevard to Northgate Boulevard) are currently experiencing erosion or are susceptible to future erosion. Erosion repair and rock slope protection is required at the PGCC and NEMDC South at the locations listed in **Table 2-11** and shown on **Plates 2-13** and **2-14**.

Table 2-11
Rock Slope Protection Areas at PGCC and NEMDC South – Adjacent Levee Alternative (Proposed Action)

Stream Confluence	Location of Rock Slope Protection
PGCC at Curry Creek	PGCC west bank opposite of where creek enters PGCC
PGCC at Pleasant Grove Creek	PGCC west bank opposite of where creek enters PGCC
PGCC at Howsley Road Bridge West Abutment	West abutment of Howsley Road Bridge
PGCC at Pierce-Roberts Drain	PGCC west bank opposite of where creek enters PGCC
NEMDC at Dry Creek	Existing west bank erosion area at confluence of Dry Creek and NEMDC
NEMDC at Arcade Creek	Existing west bank erosion area at confluence of Arcade Creek and NEMDC

Notes: NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal
Source: Data provided by Wood Rodgers in 2009

The linear extent of the proposed protection on the west bank of the NEMDC at the confluence with Dry Creek is approximately 2,500 feet. Proposed protection would include rock fill to bring the waterside bench up to existing grade, a rock blanket to stabilize the existing 2:1 bank slope below the bench, and a blanket of rock on the waterside toe to help minimize scour (launchable toe). The linear extent of the proposed protection on the west bank of the NEMDC at the confluence with Arcade Creek is approximately 400 feet. Proposed protection would include a variable width bench, a rock riprap blanket on the slope, and a launchable toe.

The bank protection areas on the west bank of the PGCC at Curry Creek, Pleasant Grove Creek, and Pierce-Roberts Drain range from 300–400 feet in length. At Curry Creek and Pleasant Grove Creek, riprap would be placed on the west levee waterside slopes opposite the confluences with Curry and Pleasant Grove Creeks, extending from the waterside toe to the top of slope for about 50 feet upstream and 100 feet downstream of the confluences. The rock would likely be covered with soil and grass. Riprap armoring would also occur opposite the outlet of the Pierce-Roberts Drain. Rock or other protection would be placed along the Howsley Road embankment and along the landside of the PGCC west levee near the Howsley Road gap to prevent erosion from undermining the gap or affecting the landslide slope. Investigations are ongoing to determine if riprap should be placed around the left (west) abutment of the Howsley Road Bridge.

The PGCC west levee and the NCC south levee between SR 99 and Howsley Road also experience a significant problem with beavers and other burrowing animals. To provide low-maintenance mitigation for this concern, a beaver exclusion wall would be constructed at these areas. The wall would be constructed of reinforced concrete or steel or vinyl sheet piling, and would be located at the waterside levee toe at a distance of about 50 feet from the levee centerline. The top of the wall would be located above the ordinary high water mark, and the bottom of the wall would reach as deep as 20 feet.

The NEMDC low-flow channel beneath and downstream of I-80 has been disturbed by the City of Sacramento Pump Station 157 outfall structure. The outfall has caused the low-flow channel to meander towards the west (right) bank of the channel, which could eventually weaken the existing NEMDC west levee. To fix this problem, the low-flow channel would be reconstructed at the middle of the channel. This reconstruction would be accomplished by creating a diversion for the existing stream flow, filling the existing low-flow channel, and excavating a new low-flow channel. The total length of the channel realignment would be approximately 1,000 feet. A rock berm would be placed between the low-flow channel and Sump 157 to minimize the impact of the pump station discharge on the west levee.

Table 2-12 lists the anticipated major materials quantities associated with this work. The sources of fill material for this work would be the Krumenacher Borrow Site and the Twin Rivers Unified School District Stockpile Site **(Plate 2-14)**. Aggregate material would come from commercial sources up to 30 miles away.

Table 2-12
Total Anticipated Major Materials Quantities for Pleasant Grove Creek Canal and Natomas East Main Drainage Canal South Waterside Levee Improvement Work – Adjacent Levee Alternative (Proposed Action)

Material Type	Quantity
Rock slope protection	8,600 tons
Beaver exclusion wall	405,800 sf
Excavation	22,250 cy
Backfill	17,800 cy

Notes: cy = cubic yards; sf = square feet
Source: Data provided by Wood Rodgers in 2009

Table 2-13 lists the anticipated equipment and construction durations for this work.

Table 2-13
Anticipated Equipment and Duration for Pleasant Grove Creek Canal and Natomas East Main Drainage Canal South Waterside Levee Improvement Work – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Erosion repair and rock slope protection installation	Front-end loaders (4)	21
	Excavators (3)	21
	Water trucks (2)	21
	Haul trucks (15)	21
	Pickup trucks (2)	21
2. Beaver protection wall installation (independent of item no. 1)	Backhoes (3)	80
	Water truck (1)	80
	Front-end loaders (2)	80
	Light duty crane (1)	80
3. NEMDC low flow channel relocation (independent of item nos. 1 or 2)	Excavator (1)	30
	Vibratory roller (1)	30
	Loaders (2)	30

Source: Data provided by Wood Rodgers in 2009

Erosion repair and rock slope protection installation would require approximately 15 people working a single 8-hour shift, 6 days a week. Installation of the beaver protection wall would require two wall installation fronts with 15 people working one 10-hour shift, 6 days a week. Relocation of the NEMDC low-flow channel would require 12 people working one 10-hour shift, 6 days a week.

Natomas East Main Drainage Canal South – Levee Vegetation Compliance

Along the NEMDC west levee south of the NEMDC Stormwater Pumping Station (Reach G), at a minimum, if a variance request is granted by USACE, vegetation removal would be required for all non-native trees from within the vegetation-free zone, all native trees that have a dbh of four inches or less, and all larger native trees that are

located in the upper 2/3 of the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet). This vegetation removal would total less than 0.6 acre. Under a worst-case scenario, approximately 1.1 acres of vegetation would be cleared on the waterside to within 15 feet of the waterside levee toe. On the landside of NEMDC South, vegetation would be cleared 10 feet from the existing toe.

Pleasant Grove Creek Canal Culvert Remediation

Five existing culverts are located beneath the PGCC west levee and extend under the canal eastward to the east side of the PGCC (**Plate 2-13**). The purpose of these culverts is to drain the area east of the PGCC when the PGCC is experiencing high flows. The Phase 3 Project described these culverts, where they pass beneath the PGCC west levee, as being replaced with pipe materials and pipe closure devices meeting USACE standards for levee penetrations. As an alternative to this upgrade-in-place option, the Phase 4b Project may remove these culverts in their entirety, beneath both the east and west PGCC levees and the PGCC itself. To mitigate for the loss of a drainage outfall area for properties east of the PGCC, five detention basins would be constructed in the area between the PGCC east levee and the Union Pacific Railroad. The basins, which are shown on **Plate 2-13**, would be set back an appropriate distance from the landside toe of the PGCC east levee. To replace the drainage function of these under drains, a combination of the detention basins, drainage channels, new lift pumps, and culverts under tributary streams may be employed. The detention basins and pumping facilities would be sized to handle runoff volumes of a 10-day storm event to protect structures, although temporary flooding of agricultural fields may be allowed during such an event. The detention basins would be returned to rice production, if feasible.

Table 2-14 lists the total anticipated major materials quantities associated with this work.

Table 2-14
Total Anticipated Major Materials Quantities for
Pleasant Grove Creek Canal Culvert Removal Work – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Quantity (cubic yards)
Excavation	4,750
Backfill	5,875

Source: Data provided by Wood Rodgers in 2009

Table 2-15 lists the anticipated equipment and construction durations for this work. The crew size for this phase of the project during its peak is estimated at 35–40 people working 10-hour shifts, 6 days a week.

State Route 99 Natomas Cross Canal Bridge Remediation

The undersides of the SR 99 bridges over the NCC (**Plate 2-16**) would be affected by high river stages in a flood event. The southern abutment for both bridges is supported by the NCC south levee. Preliminary analysis indicates the bridges are stable under this condition; however, a means to prevent the river stage from reaching the landside of the NCC south levee by way of the bridge deck is required.

Providing closure at SR 99 would entail constructing a removable barrier that would be stored off-site and installed across the roadway on the south side of the bridge when the NCC stage reached a pre-established elevation. To support the removable barrier, a permanent structure constructed at and adjacent to the highway would be constructed. The permanent support system would tie into levee raising work completed as part of the project disclosed and analyzed in the Phase 2 EIS and EIR.

Table 2-15
Anticipated Equipment and Duration for
Pleasant Grove Creek Canal Culvert Removal Work – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Culvert removal	Excavators (2)	15
	Vibratory rollers (2)	15
	Water truck (1)	15
	Front-end loaders (2)	15
	Haul trucks (2)	15
	Pickup trucks	15
2. Detention basin area stripping	Elevating scrapers (4)	5
	Loaders (2)	5
	Water trucks (2)	5
3. Detentiou basin excavation (follows no. 3)	Scrapers (15)	30
	Water trucks (2)	30
	Motor graders (2)	30
4. Demobilization/cleanup (follows no. 3)	Water trucks (2)	12
	Hydroseeding trucks (2)	12
	Haul trucks (2)	12

Source: Data provided by Wood Rodgers in 2009

Construction of the SR 99 removable barrier system would involve lane closures and traffic controls. The northbound and southbound lanes of the NCC Bridge would be closed for 2 weeks (1 week for each direction), with a total of up to 5 weeks to allow for set up and take down of traffic controls and traffic bypasses.

Underseepage mitigation at the bridges would be provided by either a series of relief wells and a relief well discharge collection system, or a SCB cutoff wall constructed by the Deep-Mix Method (DMM) through the highway road section. For a relief well installation, wells would be installed at the levee landside toe adjacent to the Howsley Road undercrossing (located just south of the NCC bridges), just off of the north shoulder of Howsley Road. Discharge from the wells would be collected in a pipe or drainage ditch and conveyed to RD 1000's existing drainage system. Alternatively, the drainage could be addressed by upgrading the existing California Department of Transportation (Caltrans) pump station beneath the Howsley Road overcrossing to accept these flows. In lieu of relief wells, a cutoff wall could be constructed through the centerline of the levee through the SR 99 roadway section to a depth of up to 95 feet. Installation of the cutoff wall would require traffic control on SR 99. Traffic control would include a cross-median detour to route southbound travel to the northbound bridge, which would be divided to allow one lane of travel in each direction. After the cutoff wall through the southbound lanes is installed and cured, the traffic detour would be reconstructed to route northbound traffic to the southbound bridge for installation of the cutoff wall through the northbound roadway. It is anticipated that each cutoff wall section could be constructed over a weekend, with the traffic routing in place at 6 p.m. Friday and removed by 6 a.m. Monday.

Table 2-16 lists the total anticipated major materials quantities associated with this work. Aggregate material would come from commercial sources up to 30 miles away.

Table 2-16
Total Anticipated Major Materials Quantities for State Route 99 Natomas Cross Canal Bridge Cutoff Wall and Closure Structure Work – Adjacent Levee Alternative (Proposed Action)

Material Type	Quantity
Reinforced concrete	50 cy
Aggregate base rock	1,250 tons
Asphalt concrete paving	1,000 tons
Salvage asphalt concrete paving	3,750 sf
SCB cutoff wall by DMM	75,000 sf

Notes: cy = cubic yards; sf = square feet; SCB = soil-cement-bentonite; DMM = Deep-Mix Method
Source: Data provided by Wood Rodgers in 2009

Table 2-17 lists the anticipated equipment and construction durations for this work.

Table 2-17
Anticipated Equipment and Duration for State Route 99 Natomas Cross Canal Bridge Cutoff Wall and Closure Structure Work – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Traffic bypass construction	Motor grader (1)	10
	Water truck (1)	10
	Front-end loader (1)	10
	Asphalt concrete paver (1)	10
	Pickup trucks (2)	10
2. Cutoff wall installation – southbound lanes (follows no. 1)	Deep soil mix rig (1)	6
	Excavator (1)	6
	Loader (1)	6 Days
3. Traffic bypass reconfiguration (Follows 2.)	Motor grader (1)	10
	Water truck (1)	10
	Front-end loader (1)	10
	Asphalt concrete paver (1)	10
	Pickup trucks (2)	10
4. Cutoff wall installation – northbound lanes (follows no. 3)	Deep soil mix rig (1)	6
	Excavator (1)	6
	Loader (1)	6
5. Closure structure construction (follows no. 4)	Pickup trucks (2)	30
	Light duty crane (1)	30
	Concrete trucks (7)	30
	Loader (1)	30
	Backhoe (1)	30

Source: Data provided by Wood Rodgers in 2009

The estimated crew size during the peak of construction would be 25–35 people working two 12-hour shifts, 6 days a week. Cutoff wall construction may be conducted 24/7.

Natomas Cross Canal South Levee – Levee Vegetation Compliance

Along the NCC south levee (Reach D:1–2), at a minimum, if a variance request is granted by USACE, vegetation removal would be required for the upper 1/2 of the waterside levee slope. This vegetation removal would be limited to a few trees. Without a variance, vegetation would also be minimal.

2.3.3.3 IRRIGATION AND DRAINAGE COMPONENTS

West Drainage Canal – Interstate 5 to Fisherman's Lake

The Phase 4b Project would include improvements to the West Drainage Canal from a point south of I-5 to the north end of Fisherman's Lake. The improvements would be designed to provide the following benefits:

- lessen the canal's potential as a wildlife attraction hazard for Airport operations by relocating the western portion of the canal farther away from the airport operations area;
- reduce bank erosion and associated water quality problems caused by the canal's excessively steep sides;
- improve RD 1000's access to maintain the canal by providing expanded rights-of-way for O&M corridors;
- reduce the build-up of aquatic weeds, which require regular removal to avoid loss of channel conveyance capacity; and
- improve the continuity of the canal corridor for movement of giant garter snake between Fisherman's Lake managed wetlands and other managed wetlands and rice fields in the northern part of the Natomas Basin by creating a shoreline band of giant garter snake habitat, a key element of the NLIP conservation strategy.

Plate 2-17 shows the proposed realignment of the westernmost portion of the West Drainage Canal (near Reach B:11A of the Sacramento River east levee), as well as the footprint of proposed improvements to the existing canal east of the portion that would be realigned. The new alignment would abandon and reroute approximately 4,700 feet of the West Drainage Canal. **Plate 2-18** (upper illustration) shows a typical cross-section for the modified West Drainage Canal, which would require a right-of-way of up to 150 feet for approximately 1.2 miles. The realigned section of the canal would have a bottom width of up to 30 feet, stable 3H:1V bank slopes on one or both sides, and a narrow, variable width bench on one side of the canal. A 20-foot-wide maintenance and inspection road would flank each side of the canal and would be slightly elevated above adjacent land to improve an all-weather road condition. Culverts would cross under the patrol road to allow continued drainage into the canal from adjacent fields. The realignment would include rerouting of a small section of the West Drainage Canal (starting at the M10 Drain south of I-5 which leads to RD 1000's Pumping Plant No. 5) to a north-south orientation to improve the management of adjacent agricultural parcels, and to move the canal farther from the Airport Operations Area in the vicinity of the west runway. Regrading of agricultural parcels between the new and old canal alignment may be required for drainage. The normal managed water depth for this reach of the West Drainage Canal would be 6–7 feet in winter and 7–8 feet in summer under both existing and proposed conditions.

Table 2-18 summarizes the proposed improvements to the existing West Drainage Canal east of the portion that would be realigned. No improvements are proposed to the south bank of the canal west of Powerline Road.

Opportunities to improve the existing West Drainage Canal are constrained by the existence of a row of power line poles located on the south side of the West Drainage Canal west of Powerline Road and on the north side of the canal east of Powerline Road. Because the poles are close to the top of the canal bank, canal improvements

would not be feasible on both sides of the canal unless the power line poles were relocated farther away. Therefore, as shown in **Table 2-18** above, improvements would be focused on the north bank of the canal west of Powerline Road (east of the realigned portion) and the south bank of the canal east of Powerline Road. No improvements would be made to the south bank west of Powerline Road, and only a 20-foot-wide right-of-way for a maintenance road would be added to the north bank east of Powerline Road.

Table 2-18
Proposed Improvements to the West Drainage Canal (Eastern Segment) – Adjacent Levee Alternative (Proposed Action)

	West of Powerline Road[1]	East of Powerline Road
North bank	20-foot-wide right-of-way for maintenance Steep banks flattened to 3H:1V slopes 2- to 5-foot-wide tule bench	20-foot-wide right-of-way for maintenance
South bank	No improvements	20-foot-wide right-of-way for maintenance Steep banks flattened to 3H:1V slopes 2- to 10-foot-wide tule bench

[1] East of the portion of the canal that would be realigned
Source: Data compiled by AECOM in 2009

On the north side of the West Drainage Canal west of Powerline Road and the south side of the canal east of Powerline Road, the steep bank would be laid back to a stable 3H:1V slope to prevent ongoing bank slumping and reduce the need for future bank repairs and sediment removal. **Plate 2-18** (lower illustration) shows a typical cross-section for these bank improvements. In these locations, the easement would be expanded between 25 and 35 feet to accommodate flattening of the banks, widening the maintenance road, and adding a 15- to 20-foot-wide setback between the road and adjacent crop fields to place and dry canal sediment and floating debris. Suitable excavated material from laying back the canal bank would be used to elevate an all-weather road above the existing field grade. Besides flattening to a 3H:1V slope, bank improvements would include creating a 2- to 10-foot-wide submerged bench with tule growth to prevent aquatic weeds such as water primrose from attaching to the bank and then expanding across the canal water surface. Bank width would vary depending upon site constraints. Invasive aquatic weeds in the Natomas Basin are known to inhibit the movement of giant garter snake as well as reduce the flow of canal water and cause eutrophic water quality conditions. The tule benches would provide improved habitat for the giant garter snake (see Section 2.3.4.1, "West Drainage Canal Habitat Improvements").

Approximately 323,000 cubic yards of material would be excavated for the new canal and used to backfill the old canal. **Table 2-19** summarizes the types of equipment that may be used throughout the construction sequence under the Adjacent Levee Alternative (Proposed Action), along with an approximation of the duration of each activity.

Riego Road Canal

A portion of an irrigation canal owned by NCMWC would be disrupted by the proposed improvements to the west levee of NEMDC North. The affected portion includes approximately 4,000 feet of irrigation canal, approximately 250 feet of buried irrigation piping and culverts, and several irrigation control turn-out structures. These facilities would be relocated outside of the levee footprint as part of the Phase 4b Project. To prevent disruption of irrigation service, the NCMWC irrigation system would be replaced with in-kind facilities compatible with the new levee footprint. The new canal would be a highline canal with 3H:1V side slopes and a maintenance road on each of the embankments. A right-of-way of up to 100 feet beyond the new levee footprint would be required for the new facility. **Plate 2-11** shows the proposed footprint of the relocated canal. Approximately 46,000 cubic yards of material would be excavated for the new canal and used to backfill the old

canal. **Table 2-20** summarizes the types of equipment that may be used throughout the construction sequence under the Adjacent Levee Alternative (Proposed Action), along with an approximation of the duration of each activity.

Table 2-19
Anticipated Equipment and Duration for West Drainage Canal Realignment and Bank Improvements – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Mobilization, topsoil removal, and canal construction	Service Vehicle (1)	0
	Scrapers (8)	5
	Scrapers (8)	28
	Dump trucks (10)	12
	Dozers (4)	9
	Water trucks (2)	6
	Compactors (2)	4
2. Canal abandonment	Dump trucks (10)	41
	Dozers (4)	32
	Water trucks (2)	20
	Compactors (2)	12
3. Topsoil respread and pipe installation	Loaders (3)	13
	Backhoe (1)	3
	Dozer (1)	1
	Water truck (1)	1
	Compactor (1)	1
4. Restoration	Hydroseed trucks (2)	14
	Water trucks (4)	15
5. Demobilization	Service Vehicle (1)	18

Source: Data provided by Mead & Hunt in 2009

Table 2-20
Anticipated Equipment and Duration for Riego Road Canal Relocation – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Mobilization, topsoil removal, and canal construction	Service Vehicle (1)	9
	Scrapers (2)	7
	Scrapers (2)	2
	Dump trucks (10)	8
	Dozers (2)	12
	Water trucks (2)	4
	Compactors (2)	2
2. Canal abandonment	Dump trucks (10)	6
	Dozers (2)	10
	Water trucks (2)	3
	Compactors (2)	2
3. Topsoil respread and pipe installation	Loaders (3)	6
	Backhoe (1)	1
	Dozer (1)	1
	Water truck (1)	1
	Compactor (1)	1
4. Restoration	Hydroseed truck (1)	4
	Water trucks (2)	4
5. Demobilization	Service Vehicle (1)	9

Source: Data provided by Mead & Hunt in 2009

Private Irrigation

Sacramento River East Levee Reaches B:13–15 and A:16–20

Several private irrigation water wells are located in the vicinity of Bryte Bend Road and Garden Highway. One of these wells at the southeast end of the Riverside Canal (Reach A:18, approximate station of 849+50) adjacent to Bryte Bend Road would be disrupted by the proposed levee improvements and would be relocated as part of the Phase 4b Project (**Plates 2-7a** and **2-7b**). This well discharges directly to the existing Riverside Canal for irrigation service to the adjacent fields for agricultural use. The water well would be relocated outside of the footprint of the levee improvements (by drilling replacement wells and abandoning the existing well) and sited at least 100 feet from the adjacent levee or seepage berm toe. To prevent disruption of service in the fields, the private irrigation well would be replaced with in-kind facilities compatible with the new levee footprint. Well construction would require 24-hour drilling for up to 3 days followed by 24-hour development pumping for up to 2 weeks.

Natomas East Main Drainage Canal

Numerous private irrigation facilities along the NEMDC would be disrupted by the proposed levee improvements and would therefore be relocated as part of the Phase 4b Project. Relocated private irrigation facilities proposed as part of the Phase 4b Project are shown on **Plates 2-11** and **2-14**. These private facilities include nine landside water wells that provide irrigation for cultivation of adjacent fields. The water wells would be relocated outside of the footprint of the levee improvements (by drilling replacement wells and abandoning existing wells) and sited at least 100 feet from the future levee toe. In addition to the wells, approximately 1,500 feet of local field irrigation ditches and approximately 2,500 feet of buried irrigation piping would be relocated. To prevent disruption of service in the fields, the private irrigation systems would be replaced with in-kind facilities compatible with the new levee footprint. Well construction would require 24-hour drilling for up to 3 days followed by 24-hour development pumping for up to 2 weeks.

Pleasant Grove Creek Canal

Numerous private irrigation facilities along the PGCC west levee would be disrupted by the proposed levee improvements and would be replaced as part of the Phase 4a Project (**Plate 2-13**). These private structures, consisting of eight landside water wells and one private river pump, service the adjacent fields for agricultural use. The water wells would be relocated outside of the footprint of the levee improvements (by drilling replacement wells and abandoning the existing wells). The river pump discharge pipes through the levee would be raised and a new positive control valves and an air release/siphon breaker valve would be added. In addition to the wells and river pump, approximately 1,900 feet of local irrigation canals and approximately 2,200 feet of buried irrigation piping would be relocated. To prevent disruption of service in the fields, the private irrigation facilities would be replaced with in-kind structures compatible with the new levee footprint. Some RD 1000 drainage facilities would be relocated prior to PGCC construction, including approximately 5,900 feet of drainage canal and 750 feet of pipe.

Natomas Cross Canal South Levee Ditch Relocations

Along the NCC south levee, between Stations 19+00 to 97+00 (Reach D:2), the Vestal Drain ditch runs parallel to the landside toe of the levee. The geotechnical analyses of the ditch in its present location shows unacceptable seepage gradients at the base of the canal. From Stations 199+00 to 244+00 (Reach D:6), the Morrison Irrigation Canal has similar gradient problems. Both canals would be removed and replaced as part of the Phase 4b Project. (The Northern Main Irrigation Canal, which also parallels the landside toe, does not present the same seepage problems and would remain in place, except as described in the Phase 4a Project.) Replacement canals would be constructed 400 feet from the existing landside toe of slope (**Plate 2-16**). The new canal size would be designed with 3H:1V side slopes. It is anticipated that there would be a balance of fill material available to fill the old canal with the material excavated from the new canal. Approximately 125,000 cubic yards would be excavated for the

new canals and used to backfill the old canals. **Table 2-21** lists the anticipated equipment and construction durations for this work.

Table 2-21
Anticipated Equipment and Duration for Natomas Cross Canal South Levee Ditch Relocations – Adjacent Levee Alternative (Proposed Action)

Construction Activity	Equipment Type and Number	Duration of Use (days)
1. Clearing and grubbing/stripping	Elevating scrapers (4)	15
	Water trucks (2)	15
	Front-end loaders (4)	15
	Pickup trucks (5)	15
2. Channel excavation and backfill (follows no. 1)	Elevating scrapers (8)	30
	Excavators (2)	30
	Water truck (1)	30
3. Demobilization/cleanup (follows no. 2)	Water trucks (2)	12
	Hydroseeding trucks (2)	12
	Extended boom pallet loader (1)	12
	Haul trucks (2)	12

Source: Data provided by Wood Rodgers in 2009

The crew size for this component of the project during its peak would be between 25–35 people working 10-hour shifts, 6 days a week.

Reclamation District 1000 Pumping Plants

Because the Natomas Basin is surrounded by levees, all excess drainage within the Basin must be pumped out. Drainage within most of the Basin is pumped to the Sacramento River and the NEMDC via RD 1000's drainage system and pumping plants. RD 1000 Pumping Plant Nos. A1, 1B, 6, and 8 are within the limits of work for the Phase 4b Project. All three pumping plants would require new discharge pipes and additional modifications to accommodate the new levee criteria and proposed levee improvements. Raising the discharge pipes at Pumping Plant Nos. 1B and 6, which currently cross the levee under Garden Highway and East Levee Road, respectively, would require closure of those roads to through-traffic for up to 60 days, with traffic detours. Raising the discharge pipes at Pumping Plant No. 8 may require a road closure at Northgate Boulevard with a traffic detour and also temporary closure of the bike path on the top of the levee. As design evaluations continue and the design is refined, additional modifications could be required to maintain the plant's current operations or meet underseepage exit gradient criteria in the inlet channels, such as adding relief wells or lining the intake channel with either filter gravel or rock-covered geotextile fabric or sump modifications. In addition, relocating the pump stations away from the levee may be necessary to accommodate the adjacent levee footprint.

Pumping Plant Nos. 1A and 1B

Pumping Plant No. 1A is not included in the NLIP, but is included in a USACE cutoff wall project as part of the Common Features Project. Pumping Plant No. 1A and 1B are located along Garden Highway approximately 1 mile west of I-5. These pumping plants are shown on **Plate 2-7b**.

Pumping Plant No. 1B consists of six pumps, a control-room building, and associated infrastructure for the pumping plant. It is located immediately adjacent to the landside levee toe in Reach A:19B. Each pump for Pumping Plant No. 1B connects to a buried discharge pipe that runs across the existing levee to an outfall structure on the east bank of the Sacramento River. There are a total of six 48-inch pipes. Six air/siphon release valves, one for each pipe, are located close to the crown of the levee in a vault on the waterside of the levee. A metering vault is located on the landside of the levee.

The pumping-plant modifications would include raising and replacing the discharge pipes that extend from Pumping Plant No. 1B across the levee within the confines of the planned levee construction to tie into the existing discharge pipes on the waterside. The air/siphon release valves would be replaced and shutoff valves would be added. The valves would be constructed in a new concrete vault in the waterside shoulder of the levee. The metering vault along with the plant access ramp may also be replaced or relocated. The pumps and motors would also be replaced and/or upgraded to account for the higher head associated with the raised discharge pipes.

To facilitate raising of the pump discharge pipes, Garden Highway would require a local raise of several feet in grade over the pipes. The road raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the length of the raised Garden Highway. The levee would transition upstream and downstream of this site from an adjacent levee to a raise of the existing levee in place. At this site, the levee would be degraded and reconstructed with engineered fill. Traffic control measures and detours would be required for up to 30 days during pipe removal and replacement under Garden Highway.

Pumping Plant No. 6

Pumping Plant No. 6 is located along the NEMDC, approximately three-quarters of a mile north of Elkhorn Boulevard (**Plate 2-11**). At this location, the existing pump discharge pipelines, which penetrate the west levee, would be reconstructed.

An excavated intake channel connects to the pumping plant. Four pumps, a control-room building, and associated infrastructure for the pumping plant are located immediately adjacent to the landside levee toe. Each pump for Pumping Plant No. 6 connects to a buried discharge pipe that crosses the existing levee and connects to an outfall structure on the NEMDC. These pipes consist of one 42-inch pipe, two 36-inch pipes, and one 30-inch pipe. Four air/siphon release valves, one for each pipe, are located close to the NEMDC on the waterside of the levee.

The pumping plant modifications would include raising and replacing the discharge pipes that extend from Pumping Plant No. 6 across the levee to tie into the existing discharge pipes within the waterside of the levee. The air/siphon release valves would be replaced and shutoff valves would be added. The valves would be constructed in a concrete vault in the waterside shoulder of the levee.

An upgrade to and/or replacement of the pumps, motors, and the electrical service including a new electrical building for Pumping Plant No. 6 would be required to provide the increased horsepower needed to pump over the levee. Use of new pumps could require the excavation of a deeper sump, which may require some associated modifications to the landside intake channel.

To facilitate raising the pump discharge pipes, East Levee Road would require a local raise in grade over the pipes. The road raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the length of the raised East Levee Road (**Plate 2-11**). The levee would transition upstream and downstream of this site from an adjacent levee to a raise of the existing levee in place. At this site, the levee would be degraded and reconstructed with engineered fill. Traffic control measures and detours would be required during pipe removal and replacement under East Levee Road.

The pipe raise would require a new outfall to comply with the USACE siphon recovery limits criteria, which limit the distance from the top of the apex of the pipe to the top of the outlet pipe. Construction of a new outfall structure would require dewatering a portion of the NEMDC.

Pumping Plant No. 8

Pumping Plant No. 8 is located along the NEMDC, approximately two-thirds of a mile north of I-80 (**Plate 2-14**). An excavated intake channel is located on the west side of Northgate Boulevard, and nine pumps and an equipment building are located immediately adjacent to the pump station on the west side of Northgate Boulevard. Each pump for Pumping Plant No. 8 connects to a buried discharge pipe that runs across the existing levee to an outfall structure on the NEMDC. There are a total of nine pipes, including five 54-inch pipes, three 36-inch pipes, and one 60-inch pipe. Nine air/siphon release valves, one for each pipe, are located close to the NEMDC on the waterside of the levee.

The pumping plant modifications would include raising and replacing the discharge pipes that extend from Pumping Plant No. 8 across the levee to tie into the existing discharge pipes within the waterside bench. The air/siphon release valves would be replaced and shutoff valves would be added. The valves would be constructed in a concrete vault in the waterside shoulder of the levee. The pumps would also be replaced and/or upgraded to account for the higher head associated with the raised discharge pipes.

An upgrade to and/or replacement of the pumps, motors, and the electrical service including a new electrical building for Pumping Plant No. 8 would be required to provide the increased horsepower needed to pump over the levee. Use of new pumps could require the excavation of a deeper sump, which may require some associated modifications to the landside intake channel.

To facilitate raising of the pump discharge pipes, the existing bike trail would require a local raise in grade over the pipes. The trail raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the length of the raised bike trail. At this site, the levee would be degraded and reconstructed with engineered fill. A detour or closure of the bike trail would be required for up to 30 days. Likewise, the pipes would need to be replaced under Northgate Boulevard. Traffic control measures and detours would be required during pipe removal and replacement under Northgate Boulevard for up to 30 days.

The pipe raise would require a new outfall to comply with the USACE siphon recovery limits criteria, which limit the distance from the top of the apex of the pipe to the top of the outlet pipe. Construction of a new outfall structure would require dewatering a portion of the NEMDC.

City of Sacramento Pumps

The City of Sacramento owns and operates several storm drainage sump pumps to pump residential and urban stormwater out of the Basin. The discharge pipes would be raised and additional modifications would be made to bring all three of the pumping plants into compliance with the new criteria. Raising the discharge pipes at City Sumps 160 and 58 (**Plates 2-7** and **2-9**, respectively), which currently cross the levee under Garden Highway, would require partial closure of the road to through-traffic for up to 30 days, with traffic detours. Raising the discharge pipes at City Sump 102 (**Plate 2-14**) would require a closure of the bike path on the top of the levee. As design evaluations continue and the design is refined, additional modifications could be required to maintain the City Sump 102's current operations. In addition, relocating the pump stations away from the levee may be necessary to accommodate the adjacent levee footprint.

City Sump 160 (Sacramento River East Levee Reach A:19B)

City Sump 160 is located along Reach A:19B of the Sacramento River east levee (**Plate 2-7b**). A 90-inch storm drain carries stormwater drainage from adjacent properties to the pump station. A chainlink fence with slats and

barbed wire is located approximately 30 feet from the landside toe of the levee and, combined with a concrete block wall, surrounds the pump station. Five pumps, an equipment building, and above ground diesel fuel storage tank, and electrical transformers are located behind the fence. Each pump for City Sump 160 connects to a buried steel discharge pipe that runs across the existing levee to an outfall structure on the Sacramento River. There are a total of five pipes, including two 54-inch pipes, two 42-inch pipes, and one 12-inch pipe. Five air/siphon release valves, one for each pipe, are located on the landside of the levee near the top. A concrete pipe support wall is located approximately 100 feet from the outfall on the waterside of the levee.

The pumping plant modifications would include raising the discharge pipes that extend from City Sump 160 across the levee to tie into the existing discharge pipes on the waterside. The air/siphon release valves would be replaced and shutoff valves would be added. The valves would be constructed in a concrete vault in the waterside shoulder of the levee. If necessary, the concrete pipe support wall would be removed and replaced. An upgrade to the pumps and diesel engines for City Sump 160 would likely be required to provide the increased horsepower needed to pump drainage water through the raised pipes.

To facilitate raising the pump discharge pipes, Garden Highway would require a local raise in grade over the pipes. The road raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the raised Garden Highway. The levee would transition upstream and downstream of this site from an adjacent levee to a raise of the existing levee in place. At this site, the levee would be degraded and reconstructed with engineered fill.

The pipe raise would require a new outfall to comply with the USACE siphon recovery limits criteria, which limit the distance from the top of the apex of the pipe to the top of the outlet pipe. Construction of a new raised outfall structure would require dewatering a portion of the Sacramento River.

City Sump 58 (American River North Levee)

City Sump 58 is located along the American River North Levee approximately 0.4 mile east of Truxel Road (**Plate 2-9**). A 30-inch storm drain carries stormwater drainage from adjacent properties to the pump station. A chainlink fence with slats and barbed wire is located at the landside toe of the levee and surrounds the pump station. Three pumps, an equipment building, trash rack hoist, and electrical transformer are located immediately adjacent to the landside levee toe. Each pump for City Sump 58 connects to a buried discharge pipe that runs across the existing levee to an outfall structure on the NEMDC. There are three pipes, including two 20-inch pipes and one 12-inch pipe. Three air/siphon release valves, one for each pipe, are located close to Garden Highway on the landside of the levee. A concrete cutoff structure located within the pipe trench surrounding the pipes is located on the waterside of the levee.

The pumping plant modifications would include replacing the discharge pipes that extend from City Sump 58 across the levee to tie into the existing discharge pipes on the waterside. The cutoff structure would be removed. The air/siphon release valves would be replaced and shutoff valves would be added. The valves would be constructed in a concrete vault in the waterside shoulder of the levee. An upgrade to the pumps, motors, and the electrical service for City Sump 58 would be required to provide the increased horsepower needed to pump through the raised pipes.

To facilitate raising the pump discharge pipes, Garden Highway would require a local raise in grade over the pipes. The road raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the length of the raised Garden Highway. At this site, the levee would be degraded and reconstructed with engineered fill.

The pipe raise would require a new outfall to comply with the USACE siphon recovery limits criteria, which limit the distance from the top of the apex of the pipe to the top of the outlet pipe. Construction of a new raised outfall structure would require dewatering a portion of the low-flow channel of the NEMDC within the American River floodway.

In addition, this pump station may need to be relocated as a seepage and stability mitigation measure because of the proximity of the pumps to the toe of the levee. Any landward shift in the levee toe would impact City Sump 58. The reconstructed City Sump 58 would consist of a cast-in-place concrete sump, with a trash rack and operating deck. An enclosure building would be provided to house the electrical, control, and monitoring equipment. The existing storm drain would need to be modified. Related infrastructure, such as access roads and utilities that serve City Sump 58 and are located within the levee footprint, would be relocated outside the footprint.

City Sump 102 (Natomas East Main Drainage Canal at Gardenland Park)

City Sump 102 is located along the NEMDC west levee adjacent to Gardenland Park north of Bowman Avenue **(Plate 2-14)**. A 60-inch storm drain carries stormwater drainage from adjacent properties to the pump station. A chainlink fence with slats and barbed wire is located at the landside toe of the levee and surrounds the pump station. Four pumps, trash rack hoist, electrical transformer, and an equipment building are located immediately adjacent to the landside levee toe. Each pump for City Sump 102 connects to a buried discharge pipe that runs across the existing levee to an outfall structure on the NEMDC. There are four pipes, including three 36-inch pipes and one 12-inch pipe. Four air/siphon release valves, one for each pipe, are located on the waterside of the levee near the top of the levee.

The pumping plant modifications would include replacing the discharge pipes that extend from City Sump 102 across the levee to tie into the existing discharge pipes within the waterside bench. The air/siphon release valves would be replaced and shutoff valves would be added. The valves would be constructed in a concrete vault in the waterside shoulder of the levee. An upgrade to the pumps, motors, and the electrical service for City Sump 102 would be required to provide the increased horsepower needed to pump through the raised pipes.

To facilitate raising of the pump discharge pipes, the bike trail would require a local raise in grade over the pipes. The trail raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the length of the raised bike trail. The levee would transition upstream and downstream of this site from an adjacent levee to a raise of the existing levee in place. At this site, the levee would be degraded and reconstructed with engineered fill.

The pipe raise would require a new outfall to comply with the USACE siphon recovery limits criteria, which limit the distance from the top of the apex of the pipe to the top of the outlet pipe. Construction of a new raised outfall structure would require dewatering a portion of the NEMDC.

In addition, this pump station may need to be relocated as a seepage and stability mitigation measure because of the proximity of the pumps to the toe of the levee. Any landward shift in the levee toe could also require relocation of City Sump 102. The reconstructed City Sump 102 would consist of a cast-in-place concrete sump, with a trash rack and operating deck. An enclosure building would be provided to house the electrical, control, and monitoring equipment. The existing storm drain would need to be modified. Related infrastructure, such as access roads and utilities that serve City Sump 102 and are located within the levee footprint, would be relocated outside the footprint.

2.3.3.4 BORROW SITES

Construction of the Phase 4b Project would use soil borrow material from a combination of sites previously analyzed in NLIP environmental documents and proposed new borrow sites, analyzed in this EIS/EIR (**Table 2-22**). Analyses of previously disclosed borrow sites is summarized in Section 4.1.3, "Summary of Previous NEPA and CEQA Analyses of Borrow Sites."

Table 2-22
Borrow Sources – Adjacent Levee Alternative (Proposed Action)

Borrow Site/Location	Status of Environmental Review	Potential Use
Natomas Boot/Bollinger	Previously analyzed as part of the Fisherman's Lake Borrow Area in the Phase 4a EIS and EIR	Sacramento River east levee Reach A:16–20/American River north levee Reach I:1-4
South Fisherman's Lake Borrow Area	Proposed as part of the Phase 4b Project	Sacramento River east levee Reach A:16–20/American River north levee Reach I:1-4
West Lakeside School Site, Natomas Unified School District	Proposed as part of the Phase 4b Project	Sacramento River east levee Reach A:16–20
Triangle Area Borrow Area	Proposed as part of the Phase 4b Project	PGCC/NEMDC
Krumenacher Borrow Site/Twin Rivers Unified School District Stockpile Site	Previously analyzed in the Phase 3 EIS and EIR	PGCC/NEMDC

Notes: EIR = environmental impact report; EIS = environmental impact statement; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal
Source: Data compiled by AECOM in 2009

Table 2-23 lists proposed new borrow sites that are fully analyzed in this EIS/EIR. These sites, which are shown on **Plate 2-6**, would provide material for the proposed levee improvements and modifications to irrigation infrastructure. After excavation of the borrow material, these sites would be reclaimed for postconstruction uses. **Table 2-23** also shows the depth of excavation, depth upon reclamation, and final postreclamation use for the proposed new borrow areas.

Table 2-23
Proposed New Borrow Areas – Adjacent Levee Alternative (Proposed Action)

Borrow Site/Area	Size of Site/Area (acres)	Amount Available for Excavation (acres)[1]	Estimated Average Depth of Excavation (feet)[2]	Current Use	Proposed Postreclamation Use
South Fisherman's Lake Borrow Area – Los Rios Community College Property	105	95	4	Row crops	Row crops
South Fisherman's Lake Borrow Area – 610 South Main, LLC Property	163	150	2	Row crops	Row crops
Triangle Properties Borrow Area	1,100	290	2–6	Rice	Rice or detention basins/grassland
West Lakeside School Site	41	20	2	Fallow	Agriculture or natural habitat

Notes:
[1] Extent of excavation within site.
[2] Depth includes approximately 1 foot of topsoil stripping. Finished elevation would be approximately 1 foot higher after surface material respread, grading, and seeding.
Source: Data provided by Mead & Hunt in 2009 and compiled by AECOM in 2009

South Fisherman's Lake Borrow Area

The South Fisherman's Lake Borrow Area is made up of two properties south of the Bollinger borrow site, which would be analyzed as new borrow sites for the Phase 4b Project. The Los Rios Community College property is directly south of the Bollinger borrow site. The three parcels that make up the 610 South Main, LLC property are south of the Los Rios Community College property. These proposed borrow areas, which are shown on **Plate 2-7a** (along Reach A:15 of the Sacramento River east levee), are currently used for agricultural row crop production. They would be excavated to a depth of 2–4 feet and returned to agricultural production.

Triangle Properties Borrow Area

The Triangle Properties Borrow Area (**Plate 2-13**) is located to the northeast of the Natomas Basin on the east side of the PGCC. It is bordered on the east by the Union Pacific Railroad. Farmland would be excavated to a depth of up to 6 feet and either reclaimed for rice cultivation or converted to detention basins to store PGCC overflow in the event that the PGCC culverts are removed. No demolition of residences or other non-agricultural uses would occur as part of borrow excavation. Excavation sites within the Triangle Properties Borrow Area would be set back at least 100 feet from existing roads, utilities, irrigation ditches, as well as residential and other non-agricultural land uses, such as the Pleasant Grove Cemetery District cemetery. The bridges for Howsley, Fifield, Keys, and Sankey Roads would be used as haul routes to bring the borrow material over the PGCC into the Natomas Basin for the construction of the PGCC and north NEMDC. Alternatively, temporary crossings of the PGCC could be constructed with culverts or bridges over the low-flow channel, to provide for off-road hauling.

West Lakeside School Site

The West Lakeside School Site (**Plate 2-17**) is owned by the Natomas Unified School District and located north of Del Paso Road and east of Fisherman's Lake. The property was historically farmed, but is currently fallow. A portion of the site is planned for the West Lakeside High School/Middle School. The remaining acreage could be shallow-graded for borrow material prior to its development as open space. In the event that the property is not developed as a school site, the shallow-graded portion would be returned to agriculture or natural habitat type appropriate to the setting. Del Paso, El Centro, San Juan, and Bryte Bend Roads could be used as haul routes to transport the material to the Sacramento River east levee construction area. In addition to use as a potential source of soil material for the construction along Sacramento River east levee, the West Lakeside School Site could also be used to provide material for the extension of the Riverside Canal in Reach A:11B (west of Powerline Road), which was previously analyzed in the Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f). The haul route for this option would be the West Drainage Canal right-of-way (off-road) and Powerline Road.

Borrow Quantities

The borrow sites listed in **Table 2-23** would provide earthen fill material for the proposed levee improvements and modifications to irrigation and drainage infrastructure. **Table 2-24** lists the estimated borrow quantities for each major levee improvement that is proposed. Actual volumes exported from borrow sites would be adjusted to match demands for fill. Estimated excavation volumes are approximated using a 125% of fill volume, to account for shrinkage from fill compaction and other losses.

Borrow Site Construction

The excavation limits on the borrow sites would provide a minimum buffer of 50 feet from the edge of the borrow site boundary or any irrigation or drainage feature. From this setback, the slope from existing grade down to the bottom of the excavation would be no steeper than 3H:1V. Excavation depths for the borrow sites would be as listed in **Table 2-23**. After excavation, disturbed areas would be finish graded in compliance with criteria for drainage of reclaimed land uses.

Table 2-24
Summarize of Fill Material to be Supplied to Proposed Project Features – Adjacent Levee Alternative (Proposed Action)

Project Feature	Quantity (cubic yards)
Sacramento River east levee Reach A:16–20	1,168,000
American River north levee Reach I:1–4	167,000
NEMDC North Reaches F–G	965,000
PGCC Reach E and NEMDC South Reach H	345,500
Total	**2,645,500**

Notes: PGCC = Pleasant Grove Creek Canal; NEMDC = Natomas East Main Drainage Canal
Source: Data compiled by AECOM in 2009

Excavated soils not used for borrow material, such as the organic surface layer or soils considered unsuitable for levee construction, would be stockpiled and respread on-site after excavation. Any unsuitable borrow material would be stockpiled on-site and graded back into the restored site, which would result in a finish grade elevation somewhat higher than the final design grades. The borrow-site excavation operations would use water for dust control and to maintain proper moisture content in the borrow material. Revegetation activities would include erosion control on excavated slopes (i.e., hydroseeding), application of fertilizer, and seeding. It is anticipated that no unsuitable material would be hauled off-site. Debris encountered during excavation would be hauled off-site.

Employee vehicles and construction equipment would be parked off street, either in the construction staging areas for the levee work, within the borrow site, or in designated parking areas. Construction equipment would be restricted to designated haul routes between the borrow operations and the construction sites. The haul route for the Triangle Properties Borrow Area could include Howsley, Fifield, Keys, and Sankey Roads. Haul Routes for properties identified inside the Basin may include segments of Del Paso, Powerline, El Centro, Bryte Bend, Radio, and San Juan Roads within the immediate vicinity of the borrow sources. Hauling on public roads would occur for short distances as required to transport material to the levee toe. Distribution of material along the levee alignment would take place within the levee footprint. Except for the American River north levee improvements, Garden Highway would not be used either as a haul route or for on-street parking.

2.3.3.5 Environmental Commitments for Borrow Sites

Although it is assumed that borrow sites listed in **Table 2-22** could supply the required earthen fill material for Phase 4b Project construction, the specific locations of borrow removal are currently unknown because investigations to determine which locations are most suitable are ongoing. Suitable material would be classified as soil based upon geotechnical data. The Phase 4b Project would not excavate material considered to be construction aggregate. This document performs project-level NEPA/CEQA analysis for the entire potential borrow areas, and also provides a checklist in **Appendix B2** to determine if borrow sites selected from within these areas after the approval of the Phase 4b Project would be consistent with identified impacts, and thus can be approved as within the Phase 4b Project and under the NLIP. Any borrow site selected within these areas would be subject to the adopted mitigation measures and other applicable environmental commitments. This approach was used successfully for the Phase 3 and 4a environmental analyses. The project proponent(s) would ensure that the following environmental commitments are met before initiating ground-disturbing activities on these borrow sites, to the extent practicable and feasible:

- minimize land use fragmentation;
- submit a Notice of Intent to the Central Valley Regional Water Quality Control Board (RWQCB), prepare and implement standard Best Management Practices and a storm water pollution prevention plan, and comply with conditions of the National Pollutant Discharge Elimination System permit;
- obtain and comply with applicable regulations and permits or exemptions (e.g., Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, Section 2081 of the California Endangered Species Act, Section 404 of the Clean Water Act, and California Surface Mining and Reclamation Act);
- complete a wetland delineation, and complete detailed design and habitat creation components and management agreements to ensure compensation for any fill of waters of the United States;
- conduct focused surveys of special-status species and habitats, develop detailed designs to ensure adequate compensation for loss of habitat, and implement all management agreements;
- survey for cultural resources (historic and prehistoric), evaluate identified resources, and develop and implement treatment for historic properties and historical resources subject to adverse effects, as required under the programmatic agreement;
- prepare and implement a traffic safety and control plan for construction-related truck trips and detours;
- implement applicable air quality district–recommended control measures to minimize temporary emissions of reactive organic gases, oxides of nitrogen, and respirable particulate matter with an aerodynamic diameter of 10 micrometers or less during construction;
- implement noise-reducing construction practices, prepare and implement a noise control plan, and monitor and record construction noise near sensitive receptors;
- coordinate with users of irrigation water before and during all modifications to irrigation infrastructure and reduce interruptions of supply;
- verify utility locations, coordinate with utility providers, prepare and implement a service-interruption response plan, and conduct worker training with respect to accidental utility damage;
- complete Phase I and/or Phase II environmental site assessments and implement required measures;
- coordinate work within Perimeter B with Airport operations and restrict night lighting within and near the runway approaches;
- conduct a wildlife-aircraft strike analysis and develop and implement mitigation for earthmoving activities within Perimeter B; and
- prepare and implement a wildfire control and management plan to minimize potential for wildland fires.

Appendix B2 provides a detailed discussion of the criteria that would apply to the selection of borrow sites for the Phase 4b Project.

2.3.4 HABITAT CREATION AND MANAGEMENT

The habitat development and management plan for the NLIP was first introduced at a program level in the Phase 2 EIR and EIS. Since 2007, the ecosystem benefits and conservation strategies of this plan have been refined, and

habitat creation targets and opportunities have been more fully evaluated. The habitat development and management plan is discussed in more detail in Section 4.7, "Biological Resources," under "Natomas Levee Improvement Program Programmatic Conservation Strategy." The habitat development and management components of the Phase 4b Project are intended to compensate for effects on existing habitat from the project's flood damage reduction and canal improvements. Because these components are also meant to further the NLIP's goal to enhance habitat values by increasing the extent and connectivity of Natomas Basin lands managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species, each component is considered integral to the success of the Basin-wide habitat management plan.

2.3.4.1 WEST DRAINAGE CANAL HABITAT IMPROVEMENTS

Currently, the lower West Drainage Canal is characterized by mostly barren, steep banks with little or no cover or foraging habitat for giant garter snake. This condition extends over several miles of the lower canal system and represents a barrier to giant garter snake movement within the Basin, potentially isolating the species' largest known population found in the Fisherman's Lake area. Improvements to the West Drainage Canal described in Section 2.3.3.3, "Irrigation and Drainage Components," would be designed to enhance giant garter snake corridor habitat compared to the existing poor habitat conditions found on West Drainage Canal south of I-5 and to increase the functional values of the managed wetlands complex on the west side of Fisherman's Lake. The canal abuts the north and east sides of The Natomas Basin Conservancy's (TNBC's) Rosa Preserve for approximately 1.5 miles at the east end of the lower canal.

These habitat features would be designed into the realigned portion of the canal (in the vicinity of Reach B:11A of the Sacramento River east levee) and added to the north bank of the existing canal between the realigned portion of the canal and Powerline Road and to the south bank between Powerline Road and the Fisherman's Lake slough (**Plate 2-17**). These habitat features would consist of:

- 3H:1V sloped banks supporting native sedges and rushes at the shoreline and native perennial grasses at the top; and
- a variable width (2- to 10-foot wide) submerged bench located within the bank, which would support a band of tules.

Flattening the slopes of the canal and planting native vegetation would create more stable banks, improving water quality and overall habitat conditions along the canal. Tules on the submerged bench would typically be inundated during summer. A tule band would preserve channel conveyance capacity by preventing noxious aquatic plants from attaching to the lower bank. Invasive aquatic weeds in the Natomas Basin are known to inhibit the movement of giant garter snake and also reduce the flow of canal water, causing eutrophic water quality conditions. The tule band would also increase available refuge for the snake while not significantly increasing habitat for waterfowl that may be hazardous to Airport operations.

2.3.4.2 WOODLAND COMPENSATION

To compensate for landside impacts to woodland in Reach A:16–20 of the Sacramento River east levee, Reach I:1–4 of the American River north levee, and along the NEMDC west levee, up to 72 acres of woodlands consisting of native riparian and valley oak woodland species would be preserved and created in and around the Natomas Basin. Up to 40 of these acres would be located in Lower Dry Creek, a 420-acre open space area located north of Main Avenue and east of the NEMDC (**Plates 2-14 and 2-19**). This area consists of Hansen Park, owned by the City of Sacramento, and the Coyle Property, which is owned by SAFCA. SAFCA has a conservation easement on Hansen Park (the western portion of the Lower Dry Creek area), and a conservation easement could also be placed on the Coyle property to the east. Existing woodland corridors along Dry Creek channels would be preserved, and additional woodland would be created by filling in gaps and widening these existing riparian corridors. Opportunities to create new woodland corridors may be available on historic stream channels that the

creek has migrated away from over time. In addition, woodland clusters could be created in meadows, providing habitat favorable to raptors. Created woodland would be designed to avoid vernal pools, seasonal wetlands, and relatively permanent water, which are shown on **Plate 2-19**. The balance of woodland compensation would occur by enhancing TNBC preserves and by preserving and creating woodland on other available sites around the Basin.

Mitigation for impacts of the Phase 4b Project to waterside woodlands, including SRA, is addressed in Section 4.7, "Biological Resources."

Woodland groves that would be created would be at least 50 feet wide and several hundred feet long, depending on location constraints. Portions of the created woodlands would be at least 100 feet wide to promote successful nesting by a variety of native birds deeper within the grove canopy, where nest parasitism by crows, cowbirds, and starlings is less of a factor in breeding success. At maturity, stand structure would vary from closed-canopy woodland to valley oak savanna vegetation types, with a native perennial grassland understory.

Planting sites would require suitable soil conditions, irrigation water during a 3- to 5-year establishment phase, reduced risk of wildfire, and minimal depth to seasonally high groundwater or other natural water sources to sustain trees once irrigation ceases. To provide irrigation water, groundwater wells may need to be drilled in the vicinity of the plantings. Drilling of well holes would take 72 hours or more. Because the drilling process must be continuous once started, 24/7 operation of the drill rig would be required. Wells would be located 1,000–1,500 feet from sensitive receptors to minimize the disturbance from 24/7 construction.

A mixture of native riparian and woodland species would be planted, but the predominant species would be valley oak, the primary tree species that would be affected by the proposed improvements to the Sacramento River east levee; and cottonwood, which is a preferred nest tree for Swainson's hawks in the Basin and is faster growing than valley oak. Establishing woody vegetation would likely require more than one technique, including planting nursery stock, live cuttings, and acorn planting in winter, sustained by flood irrigation, drip, or agricultural-scale spray heads. Taking into account predictable and unavoidable mortality within the first 5 years of establishment, the intent is to have an average stem density of approximately 50–100 trees and shrubs per acre within 5–10 years of growth. Wherever possible, groves would be bordered by restricted-access public lands and rights-of-way to reduce the risk of vandalism and other inappropriate uses that may threaten wildlife values or risk wildfires from human sources.

The botanical species composition of individual clusters and rows would mimic vegetation types commonly found along the Sacramento River, including:

- valley oak woodland;
- mixed riparian forest, cottonwood-dominant;
- shallow scrub (at moist soil sites or depressions);
- sycamore and oak savanna (with native perennial grassland); and
- elderberry shrub/scrub.

A monitoring plan with performance criteria would be developed to determine the progress of the woodland habitats towards providing adequate mitigation. The criteria for measuring performance would be used to determine if the conservation component is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the conservation component to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, which would be developed in consultation with USFWS and DFG, would include, but are not limited to:

- percent survival of planted trees (from 65–85%),
- percent survival of transplanted trees (from 60–85%), and
- percent relative canopy cover (from 5–35%).

Field assessments of woodland planting areas would be conducted once per year. The timing of these assessments would be adjusted according to annual site-specific conditions, but assessments would generally occur in late summer. To measure percent survival of trees and shrubs, each plant would be inspected and the species of each live plant would be recorded. Qualitative assessments would be recorded to track the health and vigor of each species for adaptive management of the conservation components.

To determine the success of the woodland plantings as a functioning ecosystem, percent canopy would be estimated each fall by recording the extent of woodland habitat on aerial photographs, or using repeat transects or fixed radius plots at ground level. The timing of these assessments would be adjusted according to annual site-specific conditions, but assessments would generally occur in late summer or early fall while trees are still in full foliage. The results of these assessments would also be used to determine where replanting should occur to maintain suitable Swainson's hawk habitat. All monitoring would occur for the full monitoring period or until the performance criteria are met, whichever is longer.

2.3.4.3 MANAGED MARSH CREATION

To compensate for adverse project effects on giant garter snake habitat, up to 200 acres of managed marsh would be created within the Brookfield borrow site, and the adjacent Chappell Ditch and Drain would be improved (**Plate 2-13**). The site is located south of Howsley Road, east of SR 99 and is divided into four approximately equal fields separated by farm roads running east-west. Approximately 160 acres of the 200-acre site was excavated in 2008 and 2009 to approximately 5 feet below existing grade to supply soil material for NCC south levee improvements. Use of this site for borrow was analyzed as part of the Phase 2 Project (SAFCA 2007: 2-9, 2-33). A new irrigation canal was constructed in 2009 along the eastern edge of the lower three fields, which was analyzed as part of the Phase 3 Project (USACE 2009b and SAFCA 2009b). This canal is approximately 3,900 feet long, with 15 foot access roads on either side.

The proposed managed marsh would provide giant garter snake with basking areas, vegetative cover from predators, and foraging habitat. In addition, the managed marsh habitat would compensate for losses of waters of the United States associated with the project. After establishment of the Phase 4b Project marsh, the project proponent(s) would grant TNBC a conservation easement and enter into a stakeholder-specific management agreement with TNBC, ensuring the permanent protection and management of these sites as habitat and open space. Giant garter snakes have been documented in the northwest of the basin; therefore, an additional habitat reserve in that area of the basin would be beneficial to the species. The Natomas Basin Habitat Conservation Plan (NBHCP) suggests that "the primary opportunity for connectivity between reserves is the system of channels maintained and operated by RD 1000 and Natomas Mutual [Natomas Mutual Water Company]." The Brookfield property is adjacent to Natomas Mutual's Chappell Ditch and RD 1000's CH1 Drain. As shown on **Plate 2-13**, drainage improvements are proposed as part of the borrow site marsh design, which would enhance the canals as snake habitat and improve drainage and irrigation to the Brookfield site.

The marsh would consist of a mosaic of aquatic and upland habitats, and an upland buffer between the restoration sites and adjacent roads. This created marsh would maximize habitat edge transitions to provide for shorter distances between burrow, basking, and foraging areas. Marsh design and management would optimize the values of giant garter snake habitat but minimize the attraction to wildlife species (e.g., flocks of waterfowl, starlings, pheasants) considered potentially hazardous to aircraft at low elevations as they approach or depart from runways.

Design of the managed marshes would follow the templates established by TNBC on recent projects, the design of SCAS's Willey mitigation site being developed in the northeast part of the Basin, and the existing SCAS marsh mitigation project at Prichard Lake. These design templates feature a combination of uplands and shallow water bodies, sinuosity of swales, and water control structures to manage target water levels at different times of the year. The marsh would have perimeter fences to control and protect grazing animals, such as goats. Grazing by goats is a management technique successfully used by TNBC to reduce invasions of weedy thatch and exotic plants while retaining sufficient cover for giant garter snake and other semiaquatic species that rely on grassy

uplands adjoining the wetland ponds. An essential component of the managed marsh would be procuring a firm, reliable water supply and good water quality throughout the giant garter snake's active season of April–October.

Currently, the Brookfield site's water supply comes from on-site wells, some of which are located within the footprint of the PGCC levee improvements. To provide irrigation to the site following the marsh creation and to eliminate the need to replace all of the on-site wells, the Chappell Ditch and Drain would be upgraded and extended to provide surface water to the Brookfield marsh and adjacent rice fields to the south and east (see **Plate 2-13**). This improvement would be designed to provide irrigation to approximately 940 acres formerly supplied by groundwater irrigation wells. The Chappell Ditch and Drain would be upgraded for approximately 5,000 feet from Highway 99 east and extended east to the PGCC and south along the PGCC for approximately 6,500 feet, making the total length of improvements approximately 11,500 feet. The Chappell Ditch would have 3H:1V side slopes, a bottom width of 18 feet, a depth of 6 feet, and two 15-foot-wide access roads, one on each embankment. The Chappell Drain, which provides drainage for agricultural fields to the north, would have 3H:1V side slopes, a bottom width of 12 feet, and variable depth. The construction footprint varies in width from 90 to 165 feet, plus a 20-foot temporary construction easement on each side.

In general the Brookfield marsh would flow north to south. A new supply canal would be constructed along the eastern boundary to serve irrigation water to the marsh and a drainage channel would be constructed along the western boundary.

General Construction Plan for the Managed Marsh

After excavation, disturbed areas would be finish graded to allow creation of the marsh habitat. Finish grading and installation of operational facilities and habitat features would take place from August through October. Revegetation activities would include erosion control on excavated slopes (e.g., straw mulch, hydroseeding), application of fertilizer as needed, and seeding of an initial cover crop on the finish grade of the bottom of the borrow site. Marsh plantings would then be installed and the borrow site flooded. It is anticipated that no unsuitable soil material would be hauled off-site. Debris encountered during excavation would be hauled off-site.

Other construction components are as follows:

- **Maintenance and access roads.** All-weather roads up to 15 feet wide would be constructed between the open-water channels and the upland areas in 25-foot-wide maintenance access areas.
- **Water supply and control facilities.** A well to provide a backup source of water would be installed in a location where it could supply water to the network of channels if it is needed to replace or supplement the surface-water supply. Water control facilities, such as riser boards, would be installed at key points in the channels to allow maintenance of desired water levels.
- **Habitat features for giant garter snake.** At points along the channels, clusters of rocks would be installed above the water line to provide basking areas for the snakes. Tule benches would be planted between upland areas and the channels to provide cover for the snakes.

The construction crew size would be up to 10 workers. Construction equipment would include one excavator, one bulldozer, and two backhoes. Employee vehicles and construction equipment would be parked off street, either in the construction staging areas, within the borrow site, or in designated parking areas. Construction equipment would be restricted to designated haul routes between the borrow operations and the construction sites.

2.3.4.4 MONITORING HABITAT COMPONENTS

Overall, after implementation of mitigation components, the mitigation sites would be monitored throughout the year for 3–8 years depending on the type of habitat and as developed in negotiation with the appropriate resource agencies. The project proponent(s) would be responsible for providing success monitoring, which, as required by

the appropriate resource agencies, would be conducted by a qualified ecologist, botanist, or biologist. The monitor would be objective and independent from the installation contractor responsible for site maintenance.

All habitat types and mitigation sites would receive quantitative and qualitative monitoring. Quantitative monitoring would be performed in accordance with the performance criteria described in the following sections (e.g., percent cover). Qualitative monitoring would provide an opportunity to document general plant health, overall plant community composition, hydrologic conditions, damage to the site, infestation of weeds, signs of excessive herbivory, signs of wildlife use, erosion problems, and signs of human disturbance and vandalism. These criteria would be assessed and noted for use in adaptive management of the mitigation sites, but they would not be used to determine project success. In addition, a complete list of all wildlife species encountered would be compiled for each mitigation site during each monitoring visit. Particular attention would be given to looking for evidence, as appropriate, of giant garter snake, valley elderberry longhorn beetle exit holes, and Swainson's hawk.

The project proponent(s) would prepare an annual report in conjunction with the resource managers that would be submitted to USACE (if SAFCA is the project proponent), USFWS, DFG, and the Central Valley RWQCB by December 31 of each year during the success monitoring period, or until the agencies have verified that final success criteria have been met. The report would assess the attainment of or progress toward meeting the success criteria for the mitigation sites.

2.3.4.5 Long-Term Management of Habitat Components

A Phase 4b Project Long-Term Management Plan (LTMP) would be implemented by SAFCA in connection with the Phase 4b Project Mitigation Monitoring Plan (MMP). The LTMP would establish the long-term management practices (post-establishment period success criteria) and land protection mechanisms that would be implemented as each project phase of the NLIP is approved and permitted. Land ownership and management responsibilities would be held by SAFCA, RD 1000, NCMWC, and TNBC.

2.3.4.6 Bank Protection

The Sacramento River Bank Protection Project (SRBPP) has identified 34 sites along the Sacramento River left bank from River Mile (RM) 78.8 to RM 60.2 (Sacramento River east levee Reaches C:1–4B, B:5–15, and A:16–20) where stream bank erosion has the potential to compromise the structural integrity of the levee and/or shorten the seepage path through the levee. However, because an adjacent levee will be constructed in all of these reaches, no erosion protection is needed because the distance from the projected levee slope to the current bank location is sufficient to guarantee that bank erosion will not intrude into the projected levee slope in the near future. Any gradual erosion that might occur would be addressed as a maintenance activity.

The NCC was inspected in 2005 by a SAFCA consultant, who reported minor to moderate erosion issues (Northwest Hydraulics Consultants, Inc. [NHC] 2006). NHC recommended toe protection in the lower 6,600 feet of the approximately 28,700-foot-long reach. The consultant did not develop treatment measures but described the scale of bank protection as minimal because of the low depths involved. The NCC is also inspected annually under the SRBPP, and no erosion sites on the left bank are currently identified.

Along the PGCC and NEMDC, six erosion sites have been identified for levee slope erosion repair, placement of rip rap, and/or channel realignment. All of the locations are at the confluences of tributary streams where the channel of PGCC or NEMDC has migrated to the west and threatens or has damages the right levee. These erosion sites are addressed in Section 2.3.3.2.

2.3.4.7 Natomas Levee Class 1 Bike Trail Project

As part of the Phase 4b Project, a regional Class I (completely separated from traffic) bicycle and pedestrian trail (Natomas Levee Class 1 Bike Trail Project) is proposed to be constructed in an approximately 42-mile loop along

the Natomas Basin levee perimeter in the northwestern portion of the County of Sacramento, southern portion of Sutter County, and a portion of the City of Sacramento (**Plate 2-20**). The exact alignment of the bike trail in terms of its placement in relation to levees and roadways would be determined through a detailed engineering design process. Therefore, this element of the Adjacent Levee Alternative (Proposed Action) is analyzed at a program level. Construction, operation, and maintenance of a recreation trail on the perimeter levee system would require an encroachment permit from the CVFPB with an endorsement by RD 1000. The bike trail would be funded locally, separate from this project.

The proposed recreational trail is intended to provide a bicycle commuter route at the southern and eastern end of the Natomas Basin that would connect to the regional American River Trail system. Although a paved bike trail within the City of Sacramento along the NEMDC provides a connection to the American River Trail system, no separate bikeway facilities are located in the unincorporated area of Sacramento or Sutter Counties. The lack of connection between the southwestern portion of the South Natomas and the American River Trail System discourages use of the commuting and recreational bicycling as well as jogging/walking. By separating vehicles and cyclists, the proposed recreational trail would improve safety conditions for cyclists who use Garden Highway for recreational bicycling, which currently requires them to share the roadway with vehicles. Funding for the trail would likely come from Federal or state grants or through the Metropolitan Transportation Plan (MTP) project priority list maintained by the Sacramento Area Council of Governments (SACOG).

The proposed recreational trail would include a bikeway that would be designed to exceed or meet the minimum standards for a Class I Bikeway (bike trail). Although the trail design is primarily based on bicycle parameters, the trail would also be used for walking, jogging/running, skateboarding, and roller skating/blading. **Plate 20** provides a conceptual illustration of a two-way bike trail on a separate right-of-way. However, because a detailed engineering and constraints analysis has not been conducted, it is unknown at this time whether a Class I bike trail can be achieved on every segment of the 42-mile levee system. Where a Class I bike trail cannot be constructed because of physical constraints, the bikeway would be designed to exceed or meet the minimum standards for a Class II facility (a lane set aside in city/county streets exclusively for bikes). At a minimum, the bike trail would be designed to meet the following criteria as defined in the Highway Design Manual, Chapter 10 (Caltrans 2009):

- **Hours of Use:** The bike trail would be open to the public 24/7. It is expected that the recreational trail would be closed for extended periods during high-water levels, and signage would be posted along the trail system to alert users of the closure. Also, during the regular maintenance by RD 1000, the recreational trail would be temporarily closed with signage posted to alert users of the closure and detour plan.

- **Type of Vehicles Permitted on the Trail:** By state law, motorized bicycles (mopeds) are prohibited on bike trails. Throughout the year, RD 1000 would close the recreational trail as part of levee maintenance activities. During the maintenance, heavy vehicles and/or tractor mowers would be crossing and using the bike trail for access to perform its responsibilities. Also, it is expected that RD 1000 maintenance, parks, and sheriff/police patrol and fire response vehicles and other authorized vehicles would be driving on the recreational trail system on a regular basis to patrol the levee system.

- **Widths:** The minimum paved width for a two-way bike trail would be 8 feet. A minimum 2-foot-wide graded area would be provided adjacent to the pavement (**Plate 2-21**). A 3-foot-wide graded area is recommended to provide clearance from poles, trees, walls, fences, guardrails, or other lateral obstructions. Wherever possible, a wider graded area can also serve as a jogging path.

- **Clearance to Obstructions:** A minimum 2-foot horizontal clearance to obstructions would be provided adjacent to the pavement (**Plate 2-20**). A 3-foot clearance is recommended. Where the paved width is wider than the minimum required, the clearance may be reduced accordingly; however, an adequate clearance is desirable regardless of the paved width. The clear width on structures between railings shall not be less than 8 feet. The vertical clearance to obstructions across the clear width of the trail shall be a minimum of 8 feet. Where practical, a vertical clearance of 10 feet is desirable.

- **Design Speed:** The design speed of the bike trail would be 25 miles per hour.

- **Horizontal Alignment and Super-elevation:** For most bike trail applications, the super-elevation rate would vary from a minimum of 2% to a maximum of approximately 5%. On a straight tangent section a minimum of 2% cross slope is recommended.

- **Signing and Delineation:** For the various types of and placement of signs for the trail, see the Manual on Uniform Traffic Control Devices (MUTCD), Section 9B.01 and the MUTCD and California Supplement Section 9B.01 (Caltrans 2006: 9B-1, 9B-7, and 9B-8). For pavement marking guidance, see the MUTCD, Section 9C.03.

- **Intersections with Highways:** Intersections are a prime consideration in bike trail design. If alternate locations for a bike trail are available, the one with the most favorable intersection conditions should be selected. Where motor vehicle cross traffic and bicycle traffic is heavy, grade separations are desirable to eliminate intersection conflicts. Where grade separations are not feasible, assignment of right-of-way by traffic signals should be considered. Where traffic is not heavy, stop or yield signs for bicyclists may suffice.

- **Separation between Bike Paths and Highways:** A wide separation is recommended between bike trails and adjacent highways (see MUTCD, Figure 1003.1B). Bike trails closer than 5 feet from the edge of the shoulder of an adjacent highway shall include a physical barrier to prevent bicyclists from encroaching onto the highway. Bike trails within the clear recovery zone of freeways shall include a physical barrier separation. Suitable barriers could include chain link fences or dense shrubs.

- **Placement of Bike Trail:** Depending upon the location along the Natomas Basin perimeter levee system, a variety of bike trail placement options would be available and selected through detailed engineering project design. These options, which would be subject to approval by RD 1000, would include placement on the top of levees, adjacent to levee toes, and within O&M corridors. Along Garden Highway, the options would include locating the bike trail next to the highway with a physical separation or locating it adjacent to the highway using its shoulders.

- **Trees:** To comply with levee maintenance policies, trees would not be planted as part of construction of the bike trail. However, where permitted by levee maintenance policies, container trees or other human-made shade structures may be permitted in some locations to provide shade for the trail users.

- **Safety Lighting:** Safety lighting would be provided at the all public street intersections.

- **Call Boxes:** Call boxes would be installed approximately every mile, where needed.

- **Pullout Areas, Shade Shelters, and Water Fountains:** All these features would be provided at a range of every 3 to 5 miles.

- **Pavement/Signage Maintenance:** Sacramento County Department of Transportation (SacDOT) would maintain the signage within the recreation trail easement, paved trail, and its shoulder after the completion within the unincorporated area within the County of Sacramento. It is expected the other jurisdictions would maintain their portions of the recreation trail. The maintenance agreement would be drafted and executed among the partnering jurisdictions to address the timely trail maintenance responsibility in the long run. Overall integrity of the levee structure beyond the influence area of trail easement would be maintained by RD 1000.

- **Trail Patrolling:** On behalf of the Sacramento County, Parks Department staff would patrol the levee on a daily basis. The City of Sacramento and County of Sutter may provide their own patrolling or contract with Sacramento County Parks Department regarding the patrolling for the recreational trail system in their respective jurisdictions. Trail patrolling is necessary to keep SacDOT staff informed of any vandalism, safety

concerns, and maintenance needs on the recreational trail system. Trail users would also report problems. Signage would indicate the contact information to report any issues.

Recreational Trail Construction Activities and Timing

Depending upon the final alignment of the recreational trail, construction would involve grading and paving on top of the new adjacent levee along Garden Highway or other widened levees in the Natomas Basin perimeter levee system. Because of the requirement to have newly constructed levees settle prior to final inspection and certification, trail construction in these areas would not occur until the following year's construction season, at the earliest. In addition, the long lead time in securing funding sources could delay construction for several years after completion of levee construction.

2.3.4.8 AVIATION SAFETY COMPONENTS

The Airport experiences a high rate of aircraft/bird strikes, which poses a substantial hazard to flight safety. In accordance with the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports (FAA 2007), FAA recommends that airports reduce wildlife attractants within Perimeter B, the area within a 10,000-foot radius from Air Operations Area for turbine-powered aircraft. Additionally, the FAA recommends that no land uses deemed incompatible with safe airport operations be maintained in Perimeter C, a radius of 5 miles from the edge of the Airport Operations Area, if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. Open water and agricultural crops are recognized as being the greatest wildlife attractants in the Airport vicinity, and rice cultivation is considered the most incompatible agricultural crop because of its flooding regime. The following describes the aviation safety components associated with the project:

- Work within Perimeter B would be coordinated with Airport operations and night lighting would be restricted within and near the runway approaches.
- A wildlife-aircraft strike analysis would be conducted and mitigation for earthmoving activities within Perimeter B would be developed and implemented.

2.3.4.9 OPERATIONS AND MAINTENANCE

Whether USACE or SAFCA implement the Phase 4b Project, agencies and organizations that would have management responsibility for proposed Phase 4b Project features are USACE/SAFCA, RD 1000, NCMWC, SCAS, and TNBC, as described below.

U.S. Army Corps of Engineers/Sacramento Area Flood Control Agency

Either USACE or SAFCA, as the project proponent, would be responsible for the design and construction of all levee improvements, maintenance access, inspection roads, rights-of-way, replacement canals, associated drainage and irrigation structures, and habitat creation sites. In addition, the project proponent(s) would be responsible for all necessary land acquisitions and easements to construct the project features and achieve the project objectives. However, once these project features are completed, most of the land or land management responsibilities would be transferred by the project proponent(s) to the other management entities described below. Memoranda of Agreement, land ownership transfers, or management endowments and contracts would be used by the project proponent(s) to transfer land management responsibility to the appropriate public agency or non-profit land management organization. At the end of the project construction period, all project lands would be in public ownership and/or would be under the permanent control of a natural resource conservation entity.

Reclamation District 1000

The mission and purpose of RD 1000 is to operate and maintain the flood damage reduction levees surrounding the Natomas Basin and operate and maintain the internal drainage system to evacuate agricultural and urban stormwater and incidental runoff. RD 1000 would be responsible for the management of the proposed levee improvements, when complete; the new GGS/Drainage Canal; and its reconfigured pumping plants. Typical activities include mowing grassland along levee slopes and berms, canal banks, and rights-of-way; managing canal bank vegetation, including noxious weeds; maintaining relief wells and other drainage features; periodically removing sediment from drainage canals; and maintaining and repairing canal and levee patrol roads.

Natomas Central Mutual Water Company

NCMWC is a non-profit mutual water company with the primary focus of keeping the water conveyance system functioning to serve the company shareholders. Intensive maintenance to maximize agricultural irrigation services throughout the Basin is generally limited to only 10% annually of the approximately 100 miles in the Natomas Basin canal system operated by NCMWC. NCMWC would be responsible for maintaining and managing the relocated Riego Road Canal and existing irrigation canals. The relocated canals would be maintained in the same manner as the existing canals. Typical maintenance activities include operating and repairing water control structures and barrier gates, periodically removing sediment and noxious aquatic weeds from the canals, repairing canal roads, managing bank vegetation, and mowing grassland along canal and road rights-of-way. However, compared to the existing Riego Road Canal, the relocated canal would have improved embankments, better water control structures, better vegetation cover, and wider roads and rights-of-way. These improvements are expected to ease annual canal management efforts, allowing for a proportionately greater focus on maintenance and operations and less need for repair and dredging.

Sacramento County Airport System

SCAS manages the Sacramento County-owned bufferlands outside the Airport Operations Area. All Phase 4b Project components on land under SCAS management would remain in public ownership and would be managed by SCAS.

The Natomas Basin Conservancy

TNBC acquires and manages land for the purpose of meeting NBHCP objectives. To meet the mitigation goals of the NBHCP, project developers of projects pay a mitigation fee to TNBC when they apply for building permits. TNBC then uses the mitigation fees to acquire, restore, and manage mitigation lands to provide habitat for protected species and maintain agriculture in the Natomas Basin. TNBC owns approximately 30 mitigation properties totaling more than 4,000 acres. Private land acquired by the project proponent(s) and converted to managed marsh, preserved as agricultural uplands (field crops), or used for woodland establishment as part of the Phase 4b Project would be protected by conservation easements conveyed to TNBC. After completion of reclamation activities, the project proponent(s) would contract with TNBC for management of these habitat features.

2.3.4.10 VEGETATION MANAGEMENT

USACE levee guidance requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes (USACE 2000). As shown in **Plate 2-1**, the proposed adjacent levee in Sacramento River east levee Reach A:16–20 is designed to shift the levee prism landward by creating a virtual 3H:1V waterside slope extending from the waterside edge of the designated crown (20 feet wide between the landside and waterside edges) to the extended plane of the landside ground elevation. To meet seepage criteria, this widened levee would be managed to remove and prevent any growth of trees with a drip line that penetrates the landside slope of the widened levee or the projected waterside slope. The intent of this

landward shift in the levee prism is to allow preservation of a large number of trees and important aquatic habitat, including SRA habitat located along the waterside of the Sacramento River east levee without unacceptably impairing the safety, structural integrity, and functionality of the levee. To compensate for landside vegetation removal required for the adjacent levee, a habitat creation plan has been developed to replace this habitat in a manner that has been deemed acceptable by the responsible Federal and State resource management agencies (see Section 2.3.4, "Habitat Creation and Management," above, and Impact 4.7-a, "Loss of Woodland Habitats," in Section 4.7, "Biological Resources").

As noted in Section 2.1.3.4, "Management of Levee Vegetation and Structural Encroachments," along the American River north levee, an extensive number of trees located on and along the current landside slope of the levee would be removed to accommodate the expanded levee footprint, including removal of vegetation within 15 feet of the new landside levee toe. Along the NEMDC west levee south of the NEMDC Stormwater Pumping Station (Reach G), at a minimum, vegetation removal would be required under a variance request for all non-native trees from within the vegetation-free zone, all native trees that have a dbh of four inches or less, and all larger native trees that are located on the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet). Along the NCC south levee, under the variance request, vegetation removal would be required for the upper 1/2 of the waterside levee slope.

2.3.4.11 STRUCTURAL ENCROACHMENTS

USACE levee guidance also requires an assessment of encroachments on the levee slopes, including utilities, fences, structures, retaining walls, driveways, and other features that penetrate the levee prism. Substantial encroachments are present on the Sacramento River east levee with a smaller number of encroachments on the other Natomas Basin levees. One of the objectives of constructing an adjacent levee along the Sacramento River east levee is to facilitate acceptable management of existing vegetation and structural encroachments along the waterside of this levee.

Should any of these existing encroachments be determined to reduce the integrity of the levee, increase flood risk unacceptably, or impede visibility or access to the waterside levee slope, the encroachments would need to be removed. Removal of some waterside slope encroachments may be required by the end of 2010 to ensure that the levee system meets FEMA criteria. Along the landside of the proposed adjacent levee, encroachment removal would typically be accomplished as part of the landside levee improvements. The relocation of power poles located on the existing landside slope of the levee in Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4 is anticipated to be conducted as part of the Phase 4b Project to prepare for levee improvement work. Following completion of the proposed levee improvements, USACE, the State, SAFCA, and RD 1000 would inspect and evaluate whether there are any remaining encroachments that would affect levee integrity. To the extent that removal of these identified encroachments may cause potentially significant environmental effects, future, separate NEPA and CEQA compliance and review would be required.

2.3.4.12 LANDS, EASEMENTS, RELOCATIONS, AND RIGHTS-OF-WAY

Several of the project components described above would require substantial land acquisition to accommodate the expanded levee, seepage berm, and canal footprints. In the context of the Phase 4b Project, the acquired lands would support construction of an adjacent levee along the Sacramento River east levee in Reach A:16–19B, flattening the slope of the Sacramento River east levee in Reach A:19B–20, Reach I:1–4 of the American River north levee, NEMDC and PGCC west levees, and the West Drainage Canal. In addition, sufficient land would be acquired to establish O&M access corridor at the landside toes of all the improved levees to prevent encroachment into the levee improvements, and to preserve the land for possible future expansion of levee facilities.

Land would also be acquired for use as borrow areas that would be reclaimed to create or preserve agricultural uplands. Finally, as discussed previously, the Adjacent Levee Alternative (Proposed Action) would require relocation of many existing irrigation and drainage facilities, a number of power poles serving residences along

the levees, several roadway intersections, and several private residential and nonresidential structures. Land ownership in the Phase 4b Project footprint is shown on **Plates 2-22a** through **2-22e**. All or a portion of these parcels may be acquired to construct the Phase 4b Project.

Privately owned lands would be acquired in fee. Easements would be obtained where the project features would be on Airport land (owned by Sacramento County). Where the project footprint would overlie land owned and managed by other agencies (i.e., TNBC), either acquiring the land in fee or obtaining and securing easements would be required.

Real property acquisition and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 United States Code [USC] Section 4601 et seq.) and implementing regulation, 49 Code of Federal Regulations (CFR) Part 24; and California Government Code Section 7267 et seq. Refer to Chapter 6, "Compliance with Federal Environmental Regulations," and Section 3.16, "Socioeconomics, Population, and Housing" for more details regarding these regulations.

2.4 FIX-IN-PLACE ALTERNATIVE

All elements of the Fix-in-Place Alternative would be the same as described for the Adjacent Levee Alternative (Proposed Action) except the method of raising and rehabilitating the Sacramento River east levee, including the extent of levee degradation required to construct cutoff walls, and the extent of encroachment removal along the levee. Differences from the Adjacent Levee Alternative (Proposed Action) are shown in italicized text below. For those elements that are the same as the Adjacent Levee Alternative (Proposed Action), no further discussion of the element is provided.

- **Sacramento River east levee (Reach A:16–20): Levee widening/rehabilitation and seepage remediation**—Same as the Adjacent Levee Alternative (Proposed Action), *except that the levee crown would not be widened by 15 feet, necessitating waterside vegetation removal to comply with USACE guidance criteria.*

- **Sacramento River east levee (Reach B:10–15)**: **Levee raise extension**—Same as the Adjacent Levee Alternative (Proposed Action).

- **American River north levee (Reach I:1–4): Slope flattening and seepage remediation**—Same as the Adjacent Levee Alternative (Proposed Action).

- **NEMDC North (Reaches F–G): Levee raising, slope flattening, and seepage remediation**—Same as the Adjacent Levee Alternative (Proposed Action).

- **PGCC (Reach E) and NEMDC South (Reach H): Levee raising and slope flattening**—Same as the Adjacent Levee Alternative (Proposed Action).

- **PGCC (Reach E) and NEMDC South (Reach H): Waterside improvements**—Same as the Adjacent Levee Alternative (Proposed Action).

- **PGCC (Reach E) culvert remediation**—Same as the Adjacent Levee Alternative (Proposed Action).

- **SR 99 NCC Bridge remediation (Reach D:6)**—Same as the Adjacent Levee Alternative (Proposed Action).

- **West Drainage Canal**—Same as the Adjacent Levee Alternative (Proposed Action).

- **Riego Road Canal (highline irrigation canal) relocation**—Same as the Adjacent Levee Alternative (Proposed Action).

- **NCC south levee ditch relocations**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Modifications to RD 1000 Pumping Plants**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Modifications to City of Sacramento Sump Pumps**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Borrow site excavation and reclamation**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Habitat creation and management**—Same as the Adjacent Levee Alternative (Proposed Action), *except landside woodland compensation would be up to 70 acres.*
- **Infrastructure relocation and realignment**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Landside vegetation removal**—Same as the Adjacent Levee Alternative (Proposed Action), *except maximum extent of removal would be reduced by approximately 1 acre.*
- **Waterside vegetation removal**—Same as the Adjacent Levee Alternative (Proposed Action) for modifications to RD 1000 pump stations and for the NEMDC west levee south of the NEMDC Stormwater Pumping Station. *In Reach A:16–20 of the Sacramento River east levee, it is assumed that because of the uncertainty of how USACE levee vegetation guidance criteria would be applied where the levee is not widened by an additional 15 feet (as under the Adjacent Levee Alternative [Proposed Action]), approximately 19 acres of waterside vegetation would need to be removed from the waterside hinge point of the levee crown to the water's edge as a worst-case scenario.*
- **Bank protection**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Right-of-way acquisition**—Same as the Adjacent Levee Alternative (Proposed Action).
- **Encroachment management**—Same as the Adjacent Levee Alternative (Proposed Action), *except in Reach A:16–20 of the Sacramento River east levee, it is assumed, as stated above, that the levee would not be in compliance with levee vegetation requirements on the waterside.*
- **Natomas Levee Class 1 Bike Trail Project**—Same as the Adjacent Levee Alternative (Proposed Action).

2.4.1 FLOOD RISK REDUCTION COMPONENTS

2.4.1.1 SACRAMENTO RIVER EAST LEVEE

Levee improvements under the Fix-in-Place Alternative would be constructed from the northern end of Reach A:16 through Reach 20 (Station 780+00 to Station 956+82), a distance of approximately 3.3 miles. The improvements would include the following components:

- **Fix-in-Place Levee.** The Sacramento River east levee would be upgraded in place, requiring closure of both lanes of Garden Highway in an approximately 1,000-feet-long segment that would move along the levee as construction is completed. This closure would last for the duration of the construction season—up to 6 months. Local access for homeowners would be provided, while through traffic would be detoured around the construction.

  The fix-in-place levee raise would consist of constructing an embankment from the waterside hinge point of the existing levee. The typical dimensions are shown in **Plates 2-23a** through **2-23d**. Compared to the Adjacent Levee Alternative (Proposed Action), the Fix-in-Place Alternative would reduce the footprint of the

levee improvements on the landside by approximately 15 feet. **Table 2-25** shows the width of the widened levee and the maximum limits of flood damage reduction improvements by reach.

Table 2-25
Maximum Limit of Flood Damage Reduction Improvements by Reach

Reach (Cross-Section Plate)	Stationing	Fix-in-Place Levee	Seepage Remediation	Maximum Limit of Flood Damage Reduction Improvements	
		Approximate Distance from Center Line of Garden Highway		Approximate Distance From Center Line of Garden Highway	Approximate Distance from Existing Levee Toe
A:16 (Plate 2-22a)	780+00 to 799+00	75 feet	300-foot-wide seepage berm and/or cutoff wall	445 feet	395 feet
A:16, 17, 8A (Plate 2-22a)	799+00 to 848+00	75 feet	100-foot-wide seepage berm (+ potential relief wells) and/or cutoff wall	215 feet	160 feet
A:18B, 19A (Plate 2-22b)	848+00 to 863+00	55 feet	250-foot-wide seepage berm (+ potential relief wells) and/or cutoff wall	445 feet	390 feet
A:19A, 19B (Plate 2-22b)	863+00 to 878+00	58 feet	200–250-foot-wide seepage berm (+ potential relief wells) and/or cutoff wall	271 feet to 321 feet	225 feet to 275 feet
A:19B (Plates 2-22c to 2-22d)	878+00 to 923+50	42 feet to 73 feet	Cutoff walls and relief wells	79 feet to 93 feet	79 feet to 93 feet
A:19B, 20 (Plate 2-22d)	923+50 to 950+83	80 feet	Cutoff walls and relief wells	110 feet	90 feet

Source: HDR 2010; compiled by AECOM in 2010

However, because this alternative would not shift the levee prism and encroachment-free zone away from the waterside, as illustrated in **Plate 2-1** (lower illustration), vegetation removal would be required along the Sacramento River within 15 feet of the projected waterside levee toe.

- **Cutoff Walls.** Three-foot-wide cutoff walls made of either CB or SCB would be installed through the existing levee after the existing levee has been degraded by one-third to one-half from its original height. Depending on the construction method used, the top of the cutoff walls would extend from the degraded levee elevation to a depth of 110 feet below ground surface in some areas. Locations and depths would be determined during final engineering design. The total linear extent would be approximately 17,700 feet (in Reach A:16–20).

- **Seepage Berms.** Seepage berm widths would extend up to 100 feet from the fix-in-place levee landside levee toe in Reach A:17–19A and up to 300 feet from the fix-in-place levee landside levee toe in Reach A:16 **(Plate 2-21)**. Depending upon width, seepage berms would range 6–7 feet in thickness. All berms would gradually slope downward to about 4 feet thick at the landside edge, with a 3H:1V slope to ground level. A gravel surface patrol road would be constructed near the outside edge of the seepage berms. Precise locations of the seepage berms would be determined during engineering design.

- **Relief Wells.** Relief wells would be constructed at selected locations where berms cannot be wide enough or walls deep enough to meet the required seepage remediation design parameters. Relief wells would also be

constructed along some of the entrance channels to the landside pump stations. Relief wells would be spaced 60–100 feet apart and would extend to depths of 60–80 feet below the ground surface.

- **Levee Slope Flattening.** In Reach A:19B–20, a new landside levee slope (varying from 3H:1V–2H:1V) would be constructed adjoining the existing Sacramento River east levee. The levee typical dimensions are shown in **Plate 2-24**. The existing levee already meets height requirements; therefore, the top of the new levee would be no higher than the elevation of the existing levee crown. With no levee raise, the adjacent levee crown would be graded to drain towards both the waterside and landside as it does now. Therefore, installation of surface drainage outlets across Garden Highway is not required.

- **Operation and Maintenance Access/Utility Corridors.** A 50-foot-wide O&M access corridor would be established adjacent to the toe of the levee or seepage berm. Beyond this corridor, a 20-foot-wide corridor would be established for relocation of power lines and other utility infrastructure. A 20-foot-wide O&M corridor and a 10-foot-wide utility corridor may be used in Reach A:19B–20 and at locations with landside constraints. Where feasible, the levee and seepage remediation improvements would stop short of existing rights-of-way, such as Wheelhouse Avenue, Marina Glen Way, Avocet Court/Swainson Way, and La Lima Way. However, these rights-of-way may provide a portion of the O&M corridor for levee inspection and emergency flood fight activities. Installation of retaining walls, which may be employed to limit the landward extent of the footprint, would temporarily affect these roads. However, access to residences along these roads would be maintained during construction.

- **Garden Highway Closures.** As noted above, both lanes of Garden Highway would be closed in an approximately 1,000-foot-long segment that would move along the levee as construction is completed. This closure would last for the duration of the construction season—up to 6 months. Local access for homeowners would be provided, while through-traffic would be detoured around the construction area.

- **Reconstruction of Intersections.** Garden Highway intersections at Orchard Lane and additional private parcel ramps would require reconstruction to accommodate the fix-in-place levee. Intersecting road embankments would be raised, extending the approach embankment outward from the fix-in-place levee. The design would meet Sacramento County and City of Sacramento roadway design criteria.

The levee improvements for the Phase 4b Project are anticipated to be constructed between April 15 and November 1. However, construction could extend as late as December 31. Some related activities, such as power pole relocations, and demolition or relocation of residential or agricultural structures, may be conducted before April 15, and site restoration and demobilization could extend through January. The construction crew size during peak construction would be up to 60 people per shift working two 12-hour shifts. The construction sequence would be divided into several different fronts to meet the proposed schedule. Cutoff wall construction would be conducted 24/7 only in the reaches west of the I-80 overcrossing. No 24/7 construction would be conducted in the remaining urbanized reaches of the Sacramento River east levee. Sundays would be used to maintain the cutoff wall construction equipment.

Personnel, equipment, and imported materials would reach the project site primarily by Bryte Bend Road and an off-road haul route parallel to the existing landside levee toe in Reach A:16–20. However, secondary routes may include use of I-5, Powerline Road, El Centro Road, and San Juan Road. The primary corridors where construction activity would take place are off of public roadways, within and through the soil borrow areas and within the adjacent levee alignment and existing dirt roads used for access to the work areas.

Approximately 1,097,000 cubic yards of soil borrow would be required to construct these proposed levee improvements. **Table 2-26** shows the quantity of each fill type needed and the expected source for the Fix-in-Place Alternative. The levee fill, seepage berm fill, and excavation quantities include a 25% shrinkage factor to account for volume loss during excavation, placement, and compaction. The primary source for this material

would be in the South Fisherman's Lake Borrow Area (**Plate 2-7a**). The average round-trip distance for truck hauls would be approximately 3.5 miles.

Table 2-26
Quantities of Fill Required Sacramento River East Levee – Fix-in-Place Alternative

Material Type	Quantity	Source (Average Round-Trip Haul Distance)
Levee fill	434,000 cy	South Fisherman's Lake Borrow Area (4 miles)
Seepage berm fill	663,000 cy	South Fisherman's Lake Borrow Area (4 miles)
Waste material	NA	On-site
Aggregate base	63,800 tons	Commercial source (30 miles)
Asphalt concrete	11,100	Commercial source (30 miles)
Total	**1,097,000 cy 74,900 tons**	**NA**

Notes: cy = cubic yards; NA = not applicable
Source: Data provided by HDR in 2009

Delivery of the materials listed in **Table 2-26** would require up to 960 haul trips per day. Construction in Reach A:16–19A would require an average of 510 truck trips per day based on the following assumptions: (1) construction would take place within a 6-month period, with 140 days available during the 156-day construction season (April 1–November 1), (2) truck capacities would be 14 cubic yards (24 tons), and (3) haul trucks would be used for moving all borrow material from borrow sites. Use of haul trucks for all trips is a conservative assumption because some of these trips could take place off-road and may involve the use of elevating scrapers rather than haul trucks.

For construction in Reach A:19B–20, an average of 450 truck trips per day would be required, based on the assumption that hauling would take place over a 45-day period using street-legal haul trucks with a 12 cubic yard capacity (20 tons). Lighter haul trucks would be employed in these reaches because of the increased need to use surface streets in these reaches as a result of limited space for two-way truck traffic along the landside levee toe.

Table 2-27 summarizes the types of equipment that may be used throughout the construction sequence, along with an approximation of the duration of each activity.

- **Landside Vegetation Removal.** For the Fix-in-Place Alternative, vegetation would be removed as needed from the levee footprint, which would be a minimum of 15 feet from the levee waterside toe and between 30 and 190 feet from the existing landside levee toe, depending upon the location. This operation would require removal of some trees and relocation/removal of elderberry shrubs, which occur mostly adjacent to existing roads. Small trees and elderberry shrubs, where feasible, would be relocated to woodland preservation corridors that are part of the Phase 4b Project. A minimal amount of below-ground disturbance would occur.

- **Waterside Vegetation Removal.** Under the Fix-in-Place Alternative, because of the uncertainty of how USACE levee vegetation guidance criteria would be applied in Sacramento River east levee Reach A:16–20 where the levee is not widened by an additional 15 feet (as under the Adjacent Levee Alternative [Proposed Action]), it is assumed that waterside vegetation would need to be removed from the waterside hinge point of the existing levee crown to the waterside levee toe plus an additional 15 feet (a total distance of approximately 90 feet from the waterside hinge point of the levee crown.

Table 2-27
Anticipated Equipment Types and Duration of Use for Sacramento River East Levee – Fix-in-Place Alternative

Construction Activity	Equipment Type and Number of Each Type	Duration of Use (days)
Mobilization	NA	NA
Site preparation (tree removal, clearing, grubbing, stripping)	Scrapers (6)	27
	Front-end loaders (2)	27
	Crawler/tractors (tree pushers) (2)	27
	Water trucks (2)	27
	Motor graders (2)	27
	Chippers/grinders (4)	27
	Haul trucks (10)	27
Removal of landside structures and other facilities	Excavators (2)	24
	Haul trucks (24)	24
	Front-end loader (1)	24
Construction of levee and seepage berms (includes borrow site activities)	Scrapers (6)	27
	Front-end loaders (2)	27
	Crawler/tractors (tree pushers) (2)	27
	Water trucks (2)	27
	Motor graders (2)	27
	Chippers/grinders (4)	27
	Haul trucks (10)	27
Cutoff wall construction	Front-end loaders (10)	60
	Bulldozers (20)	60
	Extended boom pallet loaders (10)	60
	300-kW generators (10)	60
	Slurry pumps (10)	60
	Pickup trucks (8)	60
	Haul trucks (8)	60
	Excavators (6)	60
	Deep soil mix rigs (10)	60
Reconstruction of Garden Highway at two intersections	Backhoe (1)	27
	Smooth drum compactor (1)	27
	Asphalt paver (1)	27
	Haul trucks (3)	27
	Striping truck (1)	27
	Truck-mounted auger (1)	27
Site restoration and demobilization	Hydroseeding trucks (3)	34
	Water trucks (3)	34
	Haul trucks (2)	34

Notes: kW = kilowatt
Source: Data provided by HDR in 2009

- **Operation and Maintenance/Utility Corridors.** A 50-foot-wide O&M access corridor would be established adjacent to the levee or seepage berm toe. Beyond this corridor, a 20-foot-wide corridor would be established for relocation of power lines and other utility infrastructure.

- **Garden Highway Drainage.** In Reach A:16–19B with no levee raise, the adjacent levee crown would be graded to drain towards both to the waterside and landside as is does now. Therefore, installation of surface drainage outlets across Garden Highway would not be required.

- **Reconstruction of Intersections.** Garden Highway intersections at Orchard Lane and additional private parcel ramps would require reconstruction to accommodate the adjacent levee. Where alternate access to the private properties is available, the private ramps would be removed and not replaced. Intersecting road embankments would be raised, typically extending the approach embankment approximately 600 feet outward from the adjacent levee. The design would meet Sacramento County and City of Sacramento roadway design criteria.

- **Construction Sequence.** With the exception of the riverbank erosion control, construction activities for the Fix-in-Place Alternative would be similar to those of the Adjacent Levee Alternative (Proposed Action). Construction of the cutoff walls under the Fix-in-Place Alternative would require the temporary removal of Garden Highway and excavation of the top one-third of the levee embankment to provide a suitable working surface to construct the cutoff wall.

- **Utilities Relocation.** All utilities (water, sewer, communication, and electrical, including power poles) that currently exist on the landside slope of the levee and at the landside levee toe would need to be relocated and/or rerouted to accommodate the widened levee footprint. A PG&E tower (Reach A:18A, at approximately Station 847+00) is located within the proposed 250-foot-wide seepage berm. The tower would potentially need to be relocated outside of the levee footprint, but all efforts would be made to protect it in place. To the extent feasible, mainline utility infrastructure, such as power poles, would be relocated beyond the landside levee, with the potential of undergrounding some utilities as an option. Should placement of poles be required on top of the seepage berms, raised foundations would be constructed to prevent the poles from penetrating the top of the seepage berm. In Reach A:19A–19B (from Station 863+00 to 923+00), where space on the landside is limited, some utility poles may need to be relocated to the waterside of the existing levee; however, no new power poles would be located on the waterside of the levee in the vicinity of existing waterside residences unless there is no feasible alternative for providing service to these residences. No power poles would be relocated within the new levee prism. Tree pruning would likely be required in some locations to accommodate the power poles and associated wires. The project proponent(s) would conduct the relocations in coordination with the appropriate utility companies and the construction operations.

2.5 COMPARISON OF THE IMPACTS OF THE ALTERNATIVES

Table 2-28 shows the overall level of significance for each issue area, and provides a comparison of significance determinations among the No-Action Alternative (No Phase 4b Project Construction and Potential Levee Failure) and the two action alternatives (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) for each of the 16 environmental issues evaluated in this EIS/EIR. As noted in the table, significance conclusions for this alternatives comparison are the result of the combination of all environmental impacts associated with a particular issue area.

Table 2-28
Comparison of the Environmental Impacts (After Mitigation Implementation) of the Phase 4b Project Alternatives[1]

Environmental Issue Area	Phase 4b Project Alternative			
	No-Action Alternative		Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
	No Phase 4b Project Construction	Potential Levee Failure		
Agricultural Resources	NI	Too Speculative	**SU**	**SU**
Land Use, Socioeconomics, Population and Housing	NI	Too Speculative	**SU**	**SU**
Geology, Soils, and Mineral Resources	NI	Too Speculative	**SU**	**SU**
Hydrology and Hydraulics	NI	**SU**	LTS	LTS
Water Quality	NI	Too Speculative	LTS	LTS
Biological Resources				
Fisheries	NI	Too Speculative	LTS	LTS
Sensitive Aquatic Habitats	NI	Too Speculative	LTS (B)	LTS (B)
Vegetation and Wildlife	**SU**	Too Speculative	**SU**	**SU**
Special-Status Terrestrial Species	NI	Too Speculative	SU	**SU**
Implementation of NBHCP	SU	Too Speculative	LTS	SU
Cultural Resources	NI	Too Speculative	**SU**	**SU**
Paleontological Resources	NI	LTS	LTS	LTS
Transportation and Circulation	NI	Too Speculative	**SU**	**SU**
Air Quality	NI	Too Speculative	LTS	LTS
Noise	NI	LTS	**SU**	**SU**
Recreation	NI	Too Speculative	SU	SU
Visual Resources	**SU**	Too Speculative	**SU**	**SU**
Utilities and Service Systems	NI	Too Speculative	LTS	LTS
Hazards and Hazardous Materials	NI	Too Speculative	LTS	LTS
Environmental Justice	NI	Too Speculative	LTS	LTS

Notes: B = Beneficial, NI = no impact, LTS = less than significant, S = significant, SU = significant and unavoidable

[1] The overall impact conclusion for each issue area for each alternative was determined as follows: Separate tables were created for each issue area, and within each alternative, the number of appearances of each significance conclusion—LTS, LTS (B), SU—after the implementation of mitigation measures was totaled. The significance conclusion that occurred the greatest number of times within each issue area was determined to be the overall impact conclusion for that alternative. For example, if four impacts were determined to be LTS and two impacts were determined to be SU, the impact conclusion would be LTS. In cases where the numbers were the same (i.e., two impacts determined to be LTS and two impacts determined to be SU), the more severe impact was used; in the case of this example, it would be SU. The No-Action Alternative (for both No Phase 4b Project Construction and Potential Levee Failure) is not subject to mitigation, and often a precise determination of significance was not possible and could be made; therefore, in these cases the impact was determined to be too speculative for meaningful consideration ("Too Speculative").

Source: Data compiled by AECOM in 2010

As shown in **Table 2-28**, no direct construction-related impacts would be associated with the No-Action Alternative (No Phase 4b Project Construction scenario). However, unless a variance is obtained, vegetation clearance would be conducted to comply with USACE levee vegetation guidance, which would cause significant and unavoidable impacts to vegetation, wildlife, and visual resources. In addition, as described in Section 2.2.1, "No-Action Alternative—No Flood Damage Reduction Measures," USACE's evaluation of geotechnical information and other data indicates that without improvements to the Natomas perimeter levee system (i.e., implementation of one of the action alternatives), an approximately 3% per year or greater probability exists that a flood could cause levee failure (Potential Levee Failure scenario). As described in Chapter 4, "Environmental Consequences and Mitigation Measures," under the analyses of the No-Action Alternative: Potential Levee Failure, impacts associated with a potential levee failure are largely unknown and would depend on the location and extent of flooding; therefore, many of these potential impacts are considered too speculative for meaningful consideration.

Although a larger number of significant and unavoidable impacts would result from implementing the Fix-in-Place Alternative than from implementing the Adjacent Levee Alternative (Proposed Action), these impacts would occur as a result of the same mechanisms (e.g., habitat loss, traffic increases).

To further compare and contrast the significant and unavoidable impacts that would result from implementing either action alternative, **Table 2-29** provides a comparison of the quantifiable environmental impacts associated with the action alternatives.

Table 2-29
Summary of Quantifiable Environmental Impacts of the Action Alternatives[1]

Environmental Impact	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
Permanent Conversion of Important Farmland	**678**	674
Potential Permanent Loss of Habitat[2]		
Rice	59	59
Canals	23	23
Landside Woodlands	**36**	35
Waterside Woodlands (SRA habitat)	**7**	**27**
Cropland	**82**	81
Grasslands	**171**	170
Loss of Elderberry Shrub	surveys in progress	surveys in progress
Potential Wetlands Filled		
Temporary	324	324
Permaneut	200	200
Potential Temporary Traffic Increases		
Sacramento River east levee Reach A:16–19A	**540**	510
Sacramento River east levee Reach A:19B–20	360	**450**
American River north levee Reach I:1–4	120	120
West levee of NEMDC North (Reaches F–G)	810	810
West levee of PGCC (Reach E)	566	566
Construction-Related Garden Highway Closures	The landside lane of Garden Highway would be closed for up to 6 months, with potential use of the waterside lane for truck hauling.	**Both lanes of Garden Highway would be closed in an approximately 1,000-foot-long segment for up to 6 months.**

Table 2-29
Summary of Quantifiable Environmental Impacts of the Action Alternatives[1]

Environmental Impact	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
Potential Temporary Air Pollutant Emissions (total mitigated emissions in 2012, combined Phase 4a and 4b Projects)		
Sacramento County:		
ROG	ROG 78 lb/day	ROG 78 lb/day
NO_X	NO_X 530 lb/day	NO_X 530 lb/day
PM_{10}	**PM_{10} 99 lb/day**	PM_{10} 81 lb/day
Sutter County:		
ROG	**ROG 317 lb/day**	ROG 17 lb/day
NO_X	NO_X 114 lb/day	NO_X 114 lb/day
PM_{10}	PM_{10} 26 lb/day	PM_{10} 26 lb/day

Notes: SRA = shaded riverine aquatic; lb/day = pounds per day; NO_X = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases

[1] All values are approximate. Refer to Chapter 4, "Environmental Consequences and Mitigation Measures," for more detail including significance criteria, mitigation measures, and other aspects of the environmental analysis. Some quantifiable environmental impacts are not presented in this table because there is no significant difference between the impacts, or data are not quantifiable. Values in **bold** denote the greater impact.

[2] Acreages represent impact prior to habitat creation and preservation as part of the NLIP programmatic conservation strategy (see Section 4.7, "Biological Resources.")

Source: Data compiled by AECOM in 2010

Implementation of the Phase 4b Project would substantially lessen the probability of a flood in the Basin due to levee failure. However, the Natomas Basin would remain subject to a residual risk of flooding (see Section 2.7, "Residual Risk of Flooding"). All of the action alternatives would have the same residual risk of flooding, with the current risk being reduced from approximately a one-in-three chance of a levee failure in a reach of the Phase 4b Project under the No-Action Alternative, to a 1-in-200 chance under both action alternatives. As described throughout Chapter 4, "Environmental Consequences and Mitigation Measures," the potential environmental impacts of a levee failure, as would occur under the No-Action Alternative, would be significant and unavoidable. Under all action alternatives, SAFCA would be required to maintain an ongoing residual risk management program, as described below.

2.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines require identification of an environmentally superior alternative from among the proposed project (i.e., Proposed Action) and the alternatives evaluated. If the No-Project Alternative (i.e., No-Action Alternative) is environmentally superior, CEQA requires identification of the "environmentally superior alternative" other than the No-Project Alternative and the alternatives evaluated. Federal NEPA guidelines also recommend that an environmentally preferred alternative be identified; however, under NEPA, that alternative does not need to be identified until the final record of decision is published. Therefore, the discussion in this section of the environmentally superior alternative is intended to satisfy CEQA requirements.

Under the No-Action Alternative (Potential Levee Failure), without improvements to the Natomas perimeter levee system, the risk of a levee failure would remain high, resulting in the potential for multiple unavoidable significant adverse effects on environmental resources (see **Table 2-28**).

Development of the action alternatives included consideration of potential effects on environmental resources (e.g., waters of the United States, woodlands, and habitat). Accordingly, levee improvements were designed to

avoid or minimize such effects where practicable. However, agricultural canals and seasonal wetlands present near the toe of the levees would require filling under either of the action alternatives because of their proximity to the existing levees. Quantification of these and other impacts is provided in **Table 2-29**. Significant impacts on certain environmental issue areas (e.g., noise, cultural resources, visual resources) cannot be quantified, and would result in similar impacts regardless of the action alternative selected.

Based on the conclusions in **Tables 2-28** and **2-29** and from conclusions presented in the previous NLIP environmental documents incorporated by reference, the Adjacent Levee Alternative (Proposed Action) would have the fewest overall environmental impacts, as well as the least environmentally damaging impacts, and therefore would be the environmentally superior alternative under CEQA. The Fix-in-Place Alternative would result in significant and unavoidable effects on SRA habitat function associated with the removal of approximately 26 acres of waterside vegetation to comply with USACE levee vegetation guidance, compared to 7 acres under the Adjacent Levee Alternative (Proposed Action).

SAFCA completed cost estimates for the entire NLIP as part of its Proposition 1E Early Implementation Program NLIP Capital Outlay Grant Application (SAFCA 2009c). The adjacent levee alternative (preferred alternative for the entire NLIP) would have an estimated first cost of $618 million, whereas the raise levee in place with setback alternative (alternative considered for the entire NLIP) would have an estimated first cost of $709.1 million (a difference of $91.1 million or approximately 15% more). These costs apply to the entire NLIP, and are not broken down by project phase; however, an estimate for the Phase 4b Project can be derived as a cost per linear foot.[1] Using this method, the Phase 4b Project Adjacent Levee Alternative (Proposed Action) would have an estimated first cost of $145.6 million[2], whereas the Phase 4b Project Fix-in-Place Alternative would have an estimated first cost of $175.1 million[3] (a difference of $29.5 million or approximately 20% more).

2.7 RESIDUAL RISK OF FLOODING

In recognition of the need to incorporate management of this residual risk into local land use planning efforts, as part of the cost-sharing agreement between the State of California and SAFCA that will facilitate non-Federal funding of the project, SAFCA will be obligated to provide the State with a safety plan that is consistent with recently adopted requirements of State law. Under these requirements, the safety plan, at a minimum, must include all of the following elements:

- a flood preparedness plan that includes storage of materials that can be used to reinforce or protect a levee when a risk of failure exists;
- a levee patrol plan for high-water situations;
- a flood-fight plan for the period before Federal or State agencies assume control over the flood fight;
- an evacuation plan that includes a system for adequately warning the general public in the event of a levee failure, and a plan for the evacuation of every affected school, residential care facility for the elderly, and long-term health care facility;
- a floodwater removal plan; and
- a requirement, to the extent reasonable, that new buildings in which the inhabitants are expected to be essential service providers are either located outside an area that may be flooded or designed to be operable shortly after the floodwater is removed.

[1] Phase 4b Project cost per linear foot = (cost for the Sacramento River east levee portion of the entire NLIP / total linear feet in Reaches 1–20 of the Sacramento River east levee) * Phase 4b Project linear feet in Reaches 10–15 of the Sacramento River east levee.
[2] Phase 4b Project Proposed Action cost per linear foot: ($448.9 million / 96,048 feet) * 31,152 feet = $145.6 million.
[3] Phase 4b Project Fix-in-Place Alternative cost per linear foot: ($540 million / 96,048 feet) * 31,152 feet = $175.1 million.

Moreover, even with these measures in place, SAFCA recognizes that the consequences of an uncontrolled flood would greatly increase over time as planned new development occurs in the Natomas Basin in accordance with the SACOG's regional blueprint. If no additional risk reduction measures are implemented, the result would be a steady rise in expected annual damages that would undermine the risk reduction accomplishments of the project.

To address this potential increase in residual risk, SAFCA has implemented a development impact fee program that applies to all new structures placed anywhere in the 200-year (0.005 AEP) floodplain of SAFCA's capital assessment district, including the Natomas Basin. The objective of this program is to avoid any substantial increase in the expected damage of an uncontrolled flood, as new development proceeds in the floodplain, through a continuing flood risk reduction program for the Natomas Basin and the lower American and Sacramento Rivers that will consist of the measures described below.

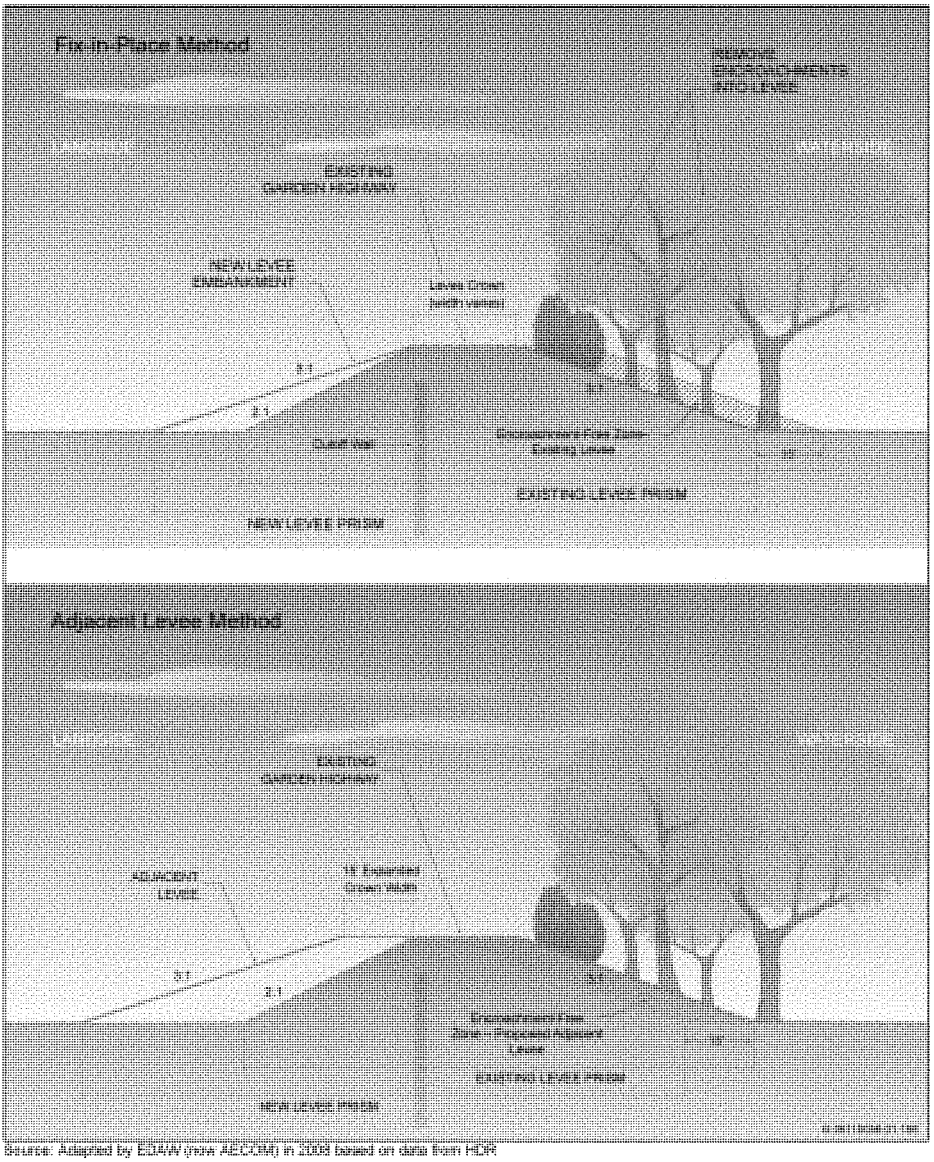
- **Waterside Levee Strengthening.** This measure would consist of a long-term program of waterside bank and levee protection improvements along the lower American and Sacramento Rivers, including the Natomas Basin, designed to arrest retreat of the upper bank, preserve waterside berm width, and reduce the potential for destabilization of the adjacent levee foundation due to erosion or ground shaking. In addition, this measure would minimize the long-term loss of mature trees and vegetation located along the affected berms and provide opportunities for expansion of the Central Valley's remnant riparian forest while enhancing the public safety purposes of the levee system.

- **Landside Levee Strengthening.** This measure would focus on improvements to the crown and landside slope of critical segments of the levee system along the NCC, PGCC, and the lower American and Sacramento Rivers to increase the resistance of these levees to overtopping and extended elevated river stages. In the Natomas Basin, these improvements would involve flattening the landside slope of the NCC south levee, the PGCC west levee, and the Sacramento River east levee to a 5H:1V profile. Along the lower American River (outside of the Natomas Basin), these improvements would involve hardening the crown and landside slope of portions of the north and south levees between Howe Avenue and Watt Avenue.

- **Acquisition of Agricultural Preservation Easements.** This measure would focus on acquiring agricultural pre-conservation easements from willing landowners occupying the levee-protected floodplains upstream and immediately downstream of the Fremont Weir located outside of the Natomas Basin. The purpose of these easements would be to compensate the participating landowners for abandoning the development rights associated with their property. These easements would remove the incentive to improve the levees protecting the property beyond the minimum design requirements of the Sacramento River Flood Control Project (SRFCP) and would thus ensure that these levees are not raised above the design of the SRFCP, which is governed by the "1957 profile." This would reinforce the design of the early implementation project and the NLIP as a whole, which assumes that upstream levees are improved to the SRFCP top of levee design and overtop without failing when water surface elevations exceed this design. It is assumed that SAFCA's development impact fee revenue would constitute only a portion of the revenue devoted to this measure, with the balance coming from the Federal and State governments as part of a comprehensive update of the plan of flood damage reduction for the Sacramento Valley (**Plate 1-2**).

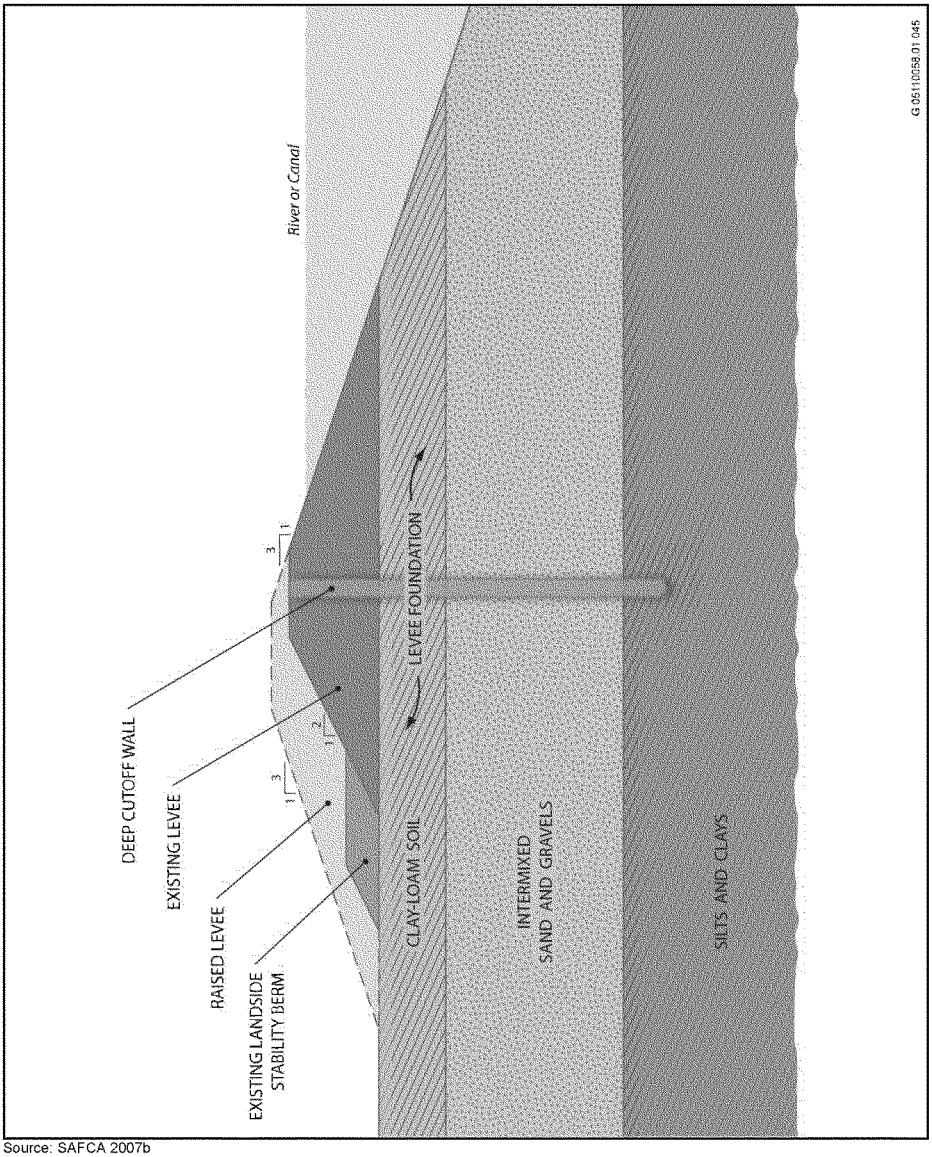
- **Improved System Operations.** This measure would focus on opportunities to improve the operation of the SRFCP to reduce water surface elevations in the lower American and Sacramento Rivers and in the drainage channels around the Natomas Basin. These opportunities would include implementing weather forecast–based operations at Folsom Dam and Reservoir and increasing the conveyance capacity of the Yolo and Sacramento Bypass systems. It is assumed that SAFCA's development impact fee revenue would constitute only a portion of the revenue devoted to this measure, with the balance coming from the Federal and State governments as part of a comprehensive update of the plan of flood damage reduction for the Sacramento Valley.

PLATES



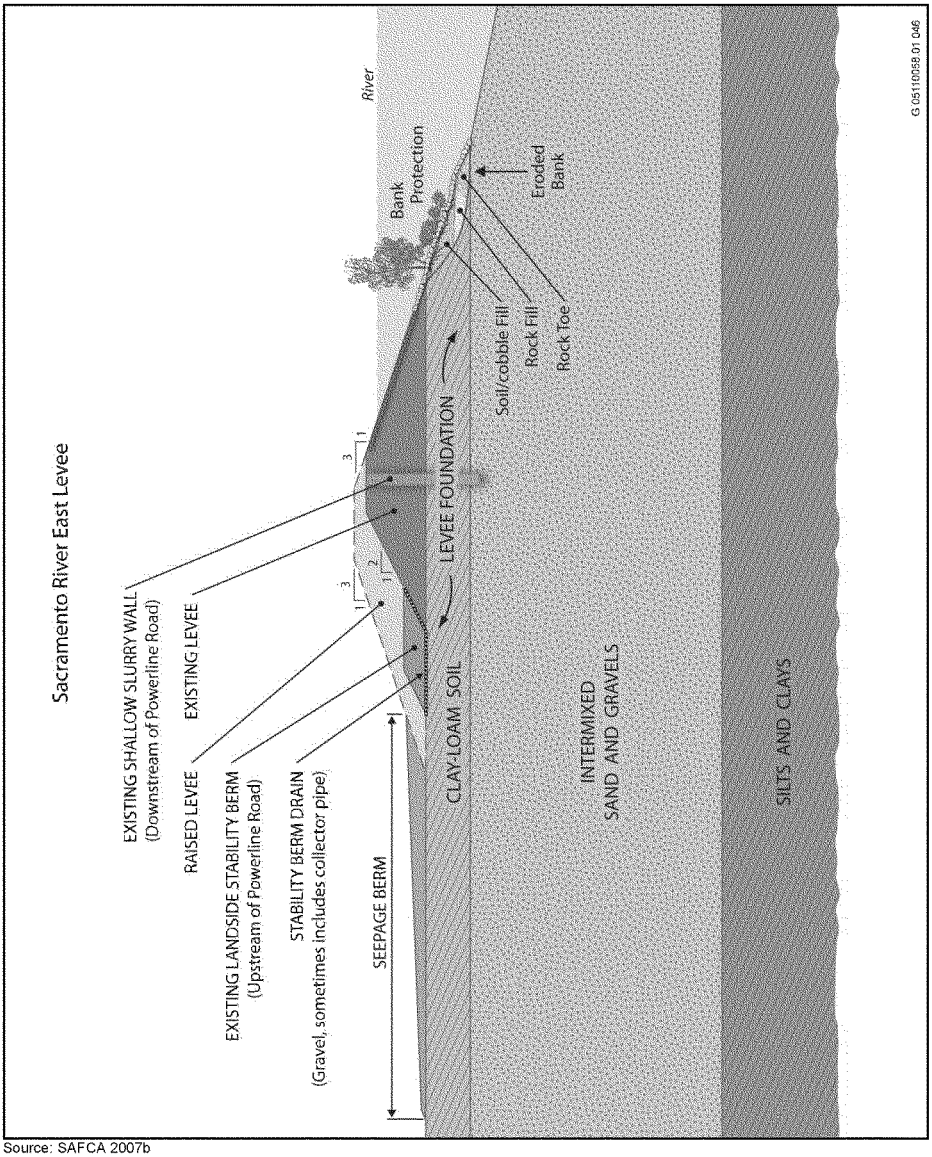
Sources: Adapted by EDAW (now AECOM) in 2008 based on data from HDR

Alternative Methods for Upgrading Levees **Plate 2-1**



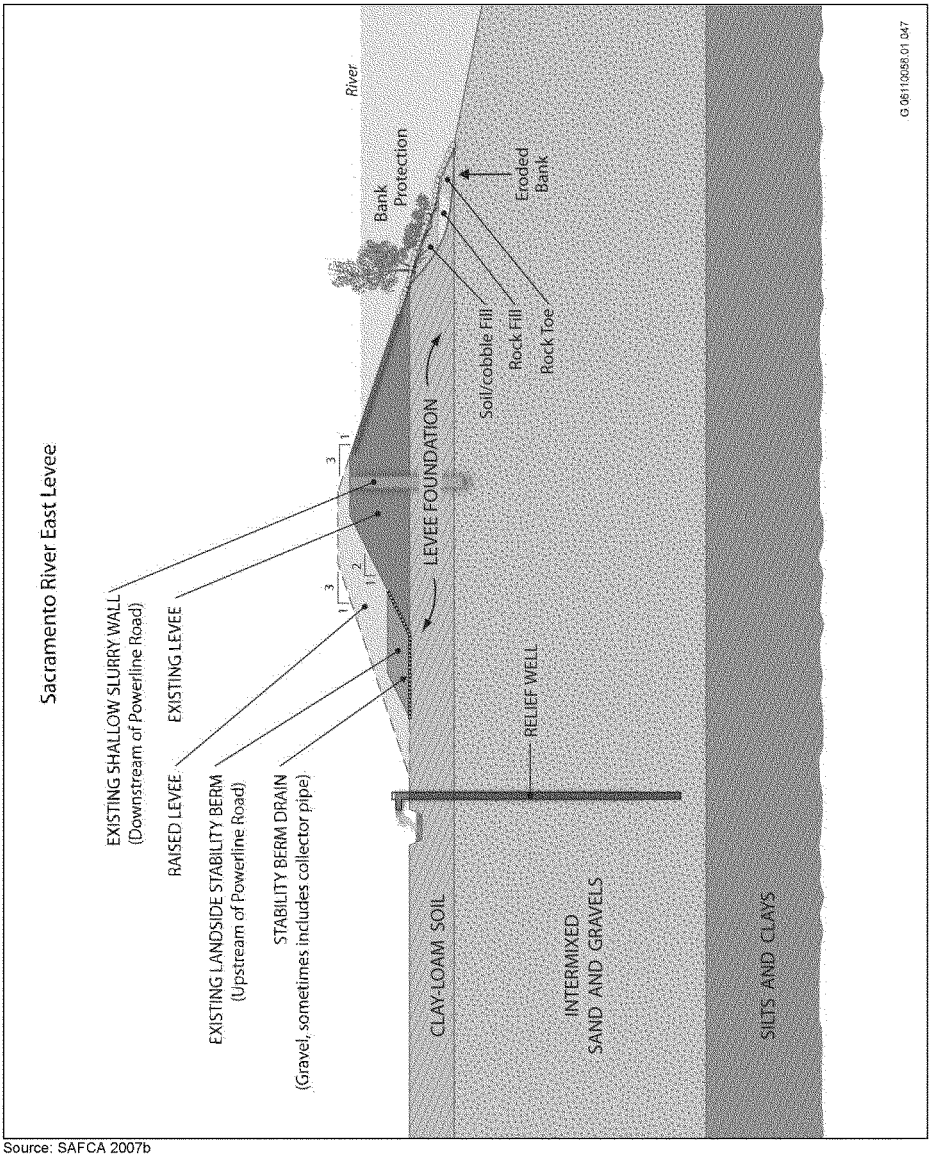
Source: SAFCA 2007b

Typical Levee Raise, Flattening of Landside Levee Slope, and Seepage Cutoff Wall **Plate 2-2**



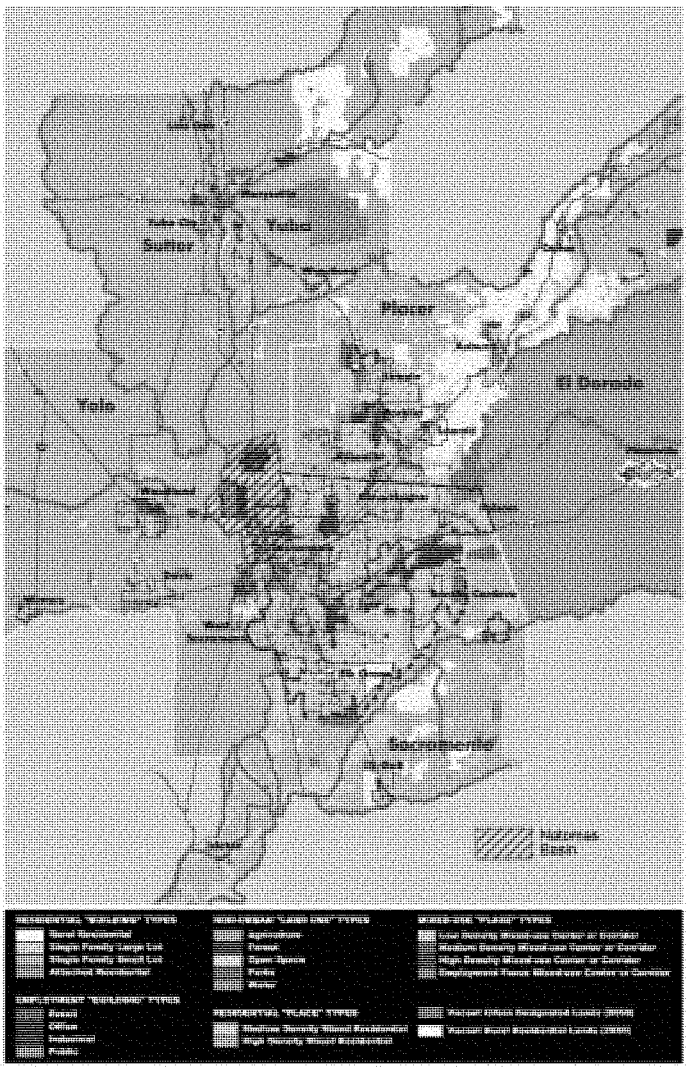
Source: SAFCA 2007b

Typical Seepage Berm **Plate 2-3**



Source: SAFCA 2007b

Typical Relief Well **Plate 2-4**



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Source: SACOG 2004

SACOG Preferred Blueprint Scenario Map **Plate 2-5**

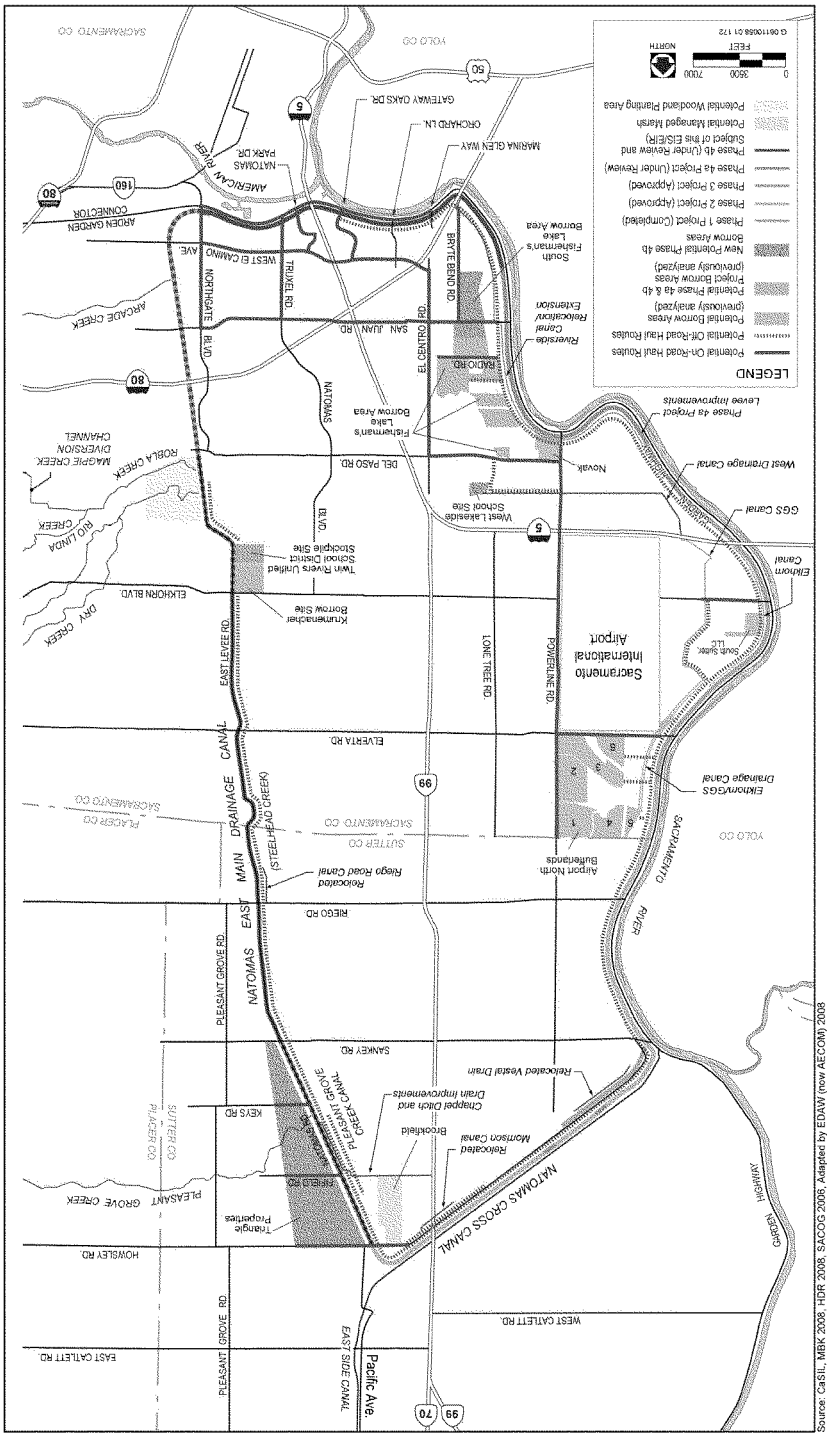
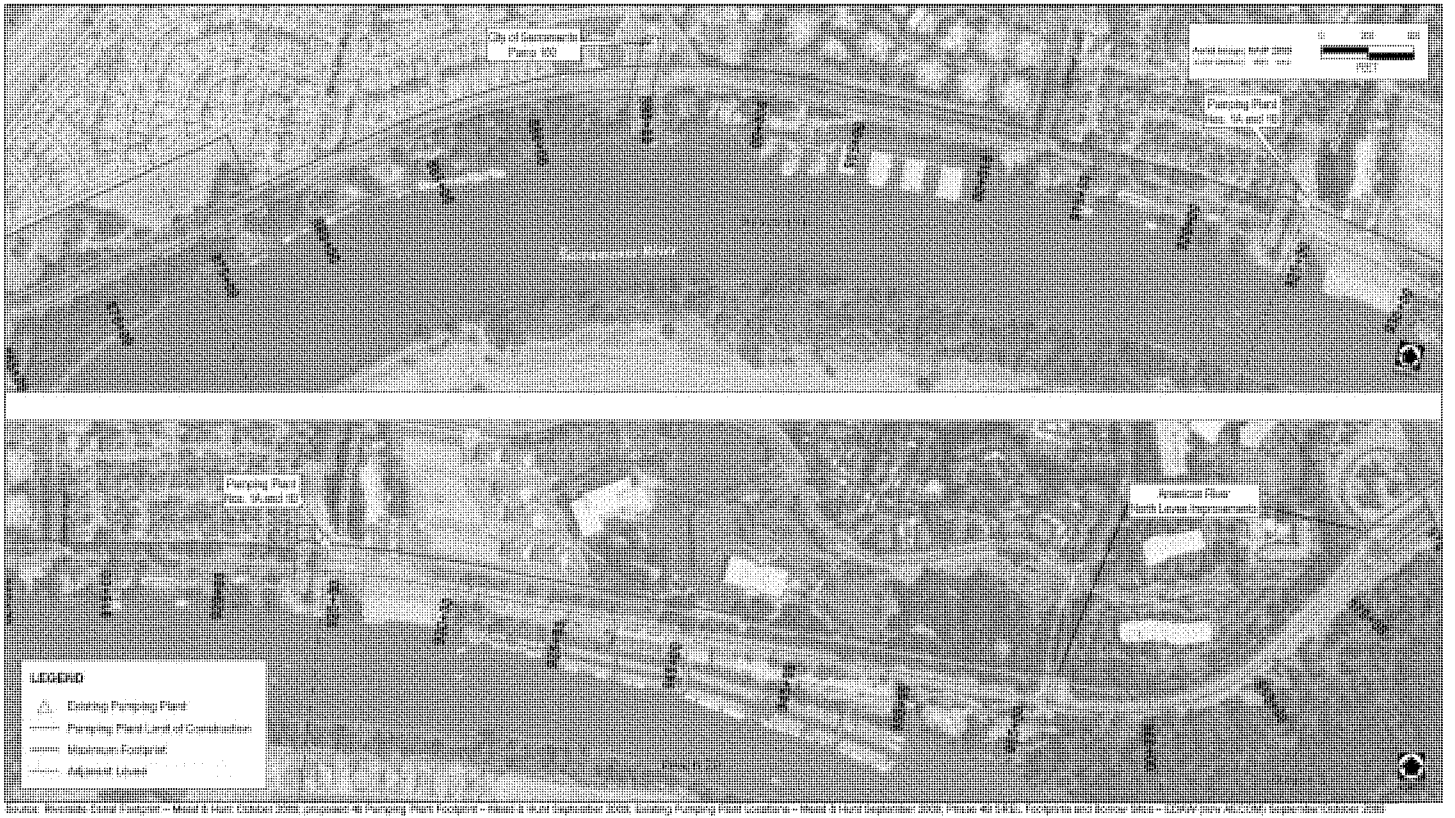


Plate 2-6

NLIP Construction Phasing and Anticipated Haul Routes from Soil Borrow Areas

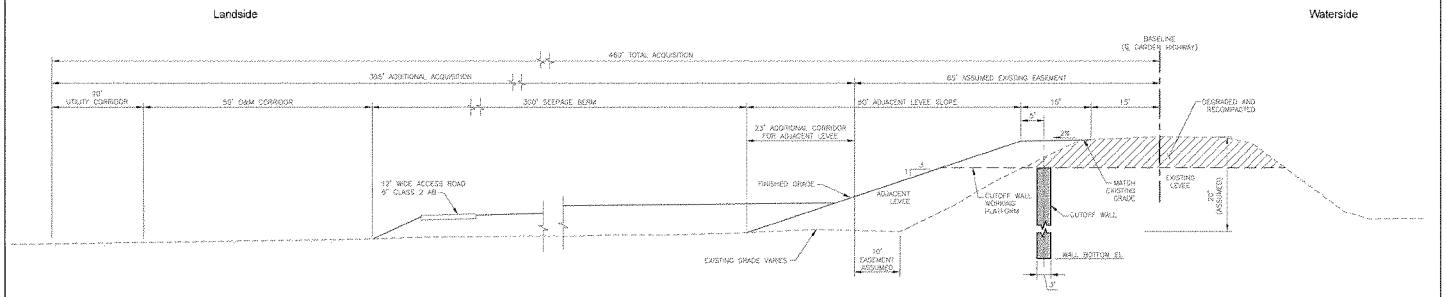
Proposed Phase 4b Project Features – Sacramento River East Levee Reaches 16–20

Plate 2-7a

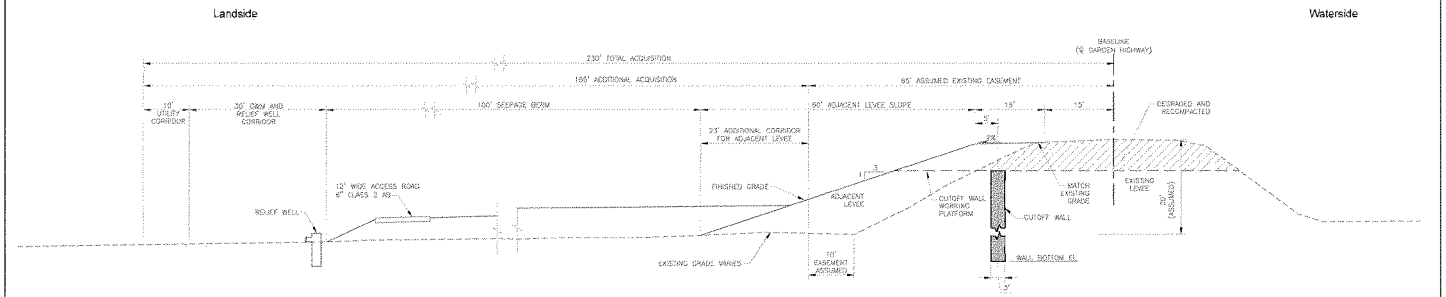


Proposed Phase 4b Project Features – Sacramento River East Levee Reaches 16–20

Plate 2-7b



Adjacent Levee Section – Reaches 16 (partial) – 3:1 Slope with 300' Seepage Berm, Cutoff Wall



Adjacent Levee Section – Reaches 16 (partial), 17, 18A – 3:1 Slope with 100' Seepage Berm, Cutoff Wall

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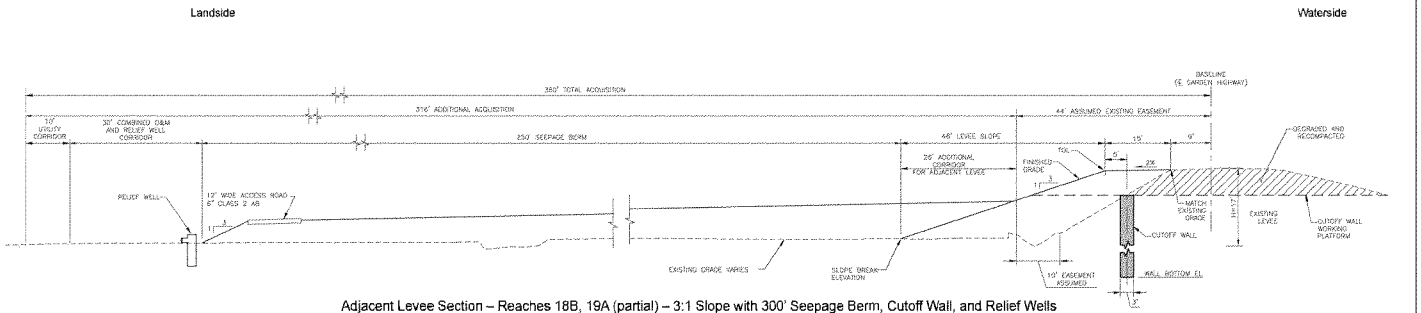
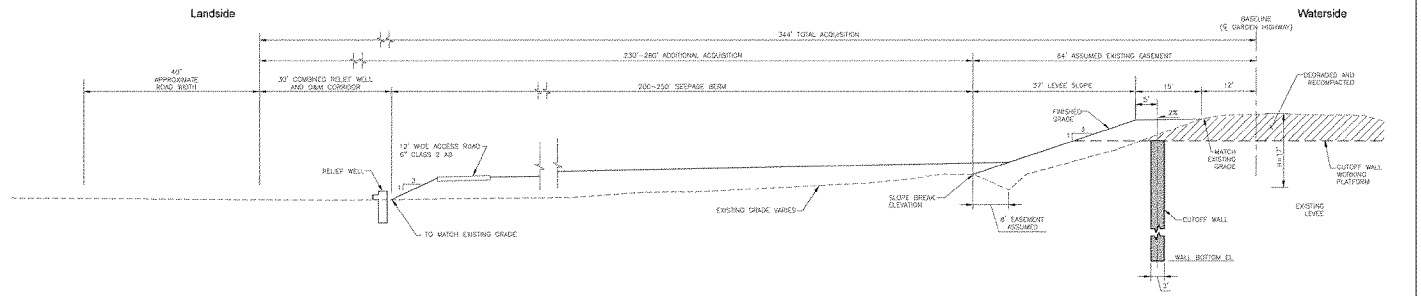
Source: HDR 2009

Cross-Sections – Sacramento River East Levee Reach A:16–18A **Plate 2-8a**



Adjacent Levee Section – Reaches 18B, 19A (partial) – 3:1 Slope with 300' Seepage Berm, Cutoff Wall, and Relief Wells



Adjacent Levee Section – Reaches 19A (partial), 19B (partial) – 3:1 Slope with Seepage Berm, Cutoff Wall, and Relief Wells

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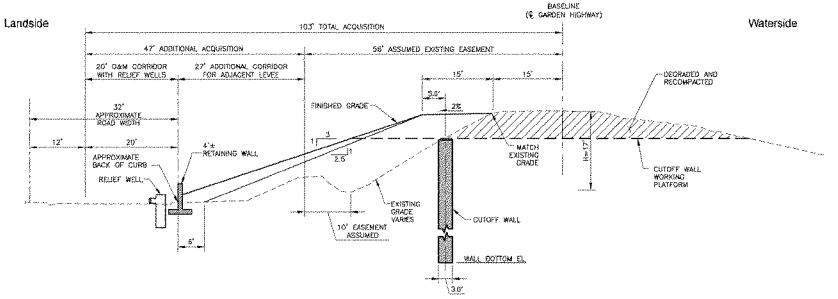
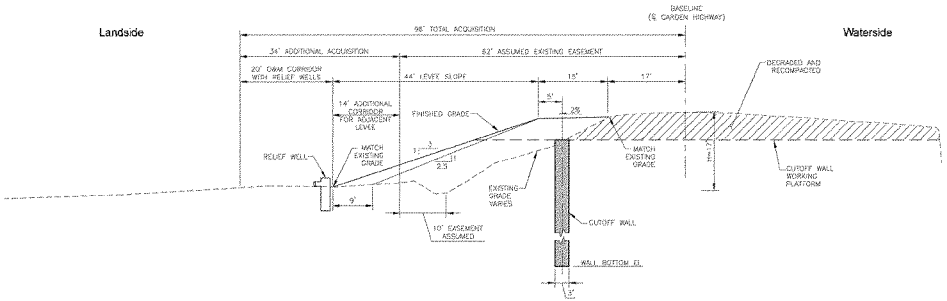
Source: HDR 2009

Cross-Sections – Sacramento River East Levee Reach A:18B–19B **Plate 2-8b**



Adjacent Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope with Cutoff Wall and Relief Wells



Adjacent Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope with Cutoff Wall and Relief Wells

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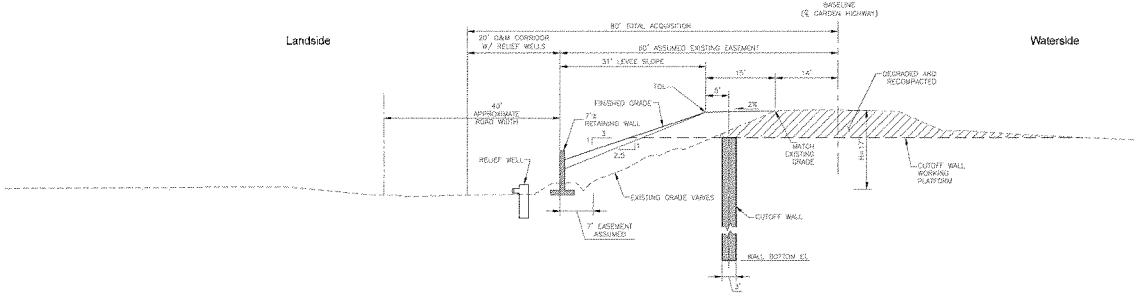
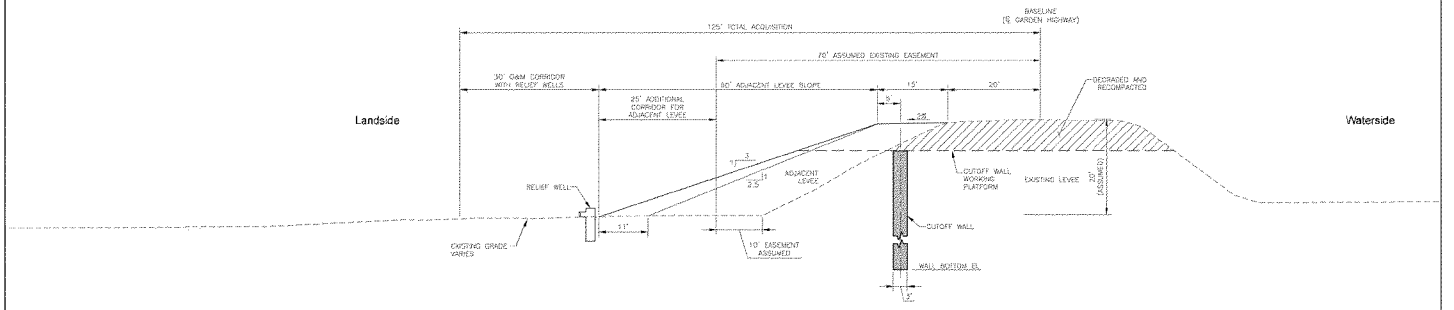
Source: HDR 2009

Cross-Sections – Sacramento River East Levee Reach A:19B

Plate 2-8c



Adjacent Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope with Cutoff Wall and Relief Wells



Adjacent Levee Section – Reaches 19B (partial), 20 – 3:1 to 2.5:1 Slope with Cutoff Wall and Relief Wells

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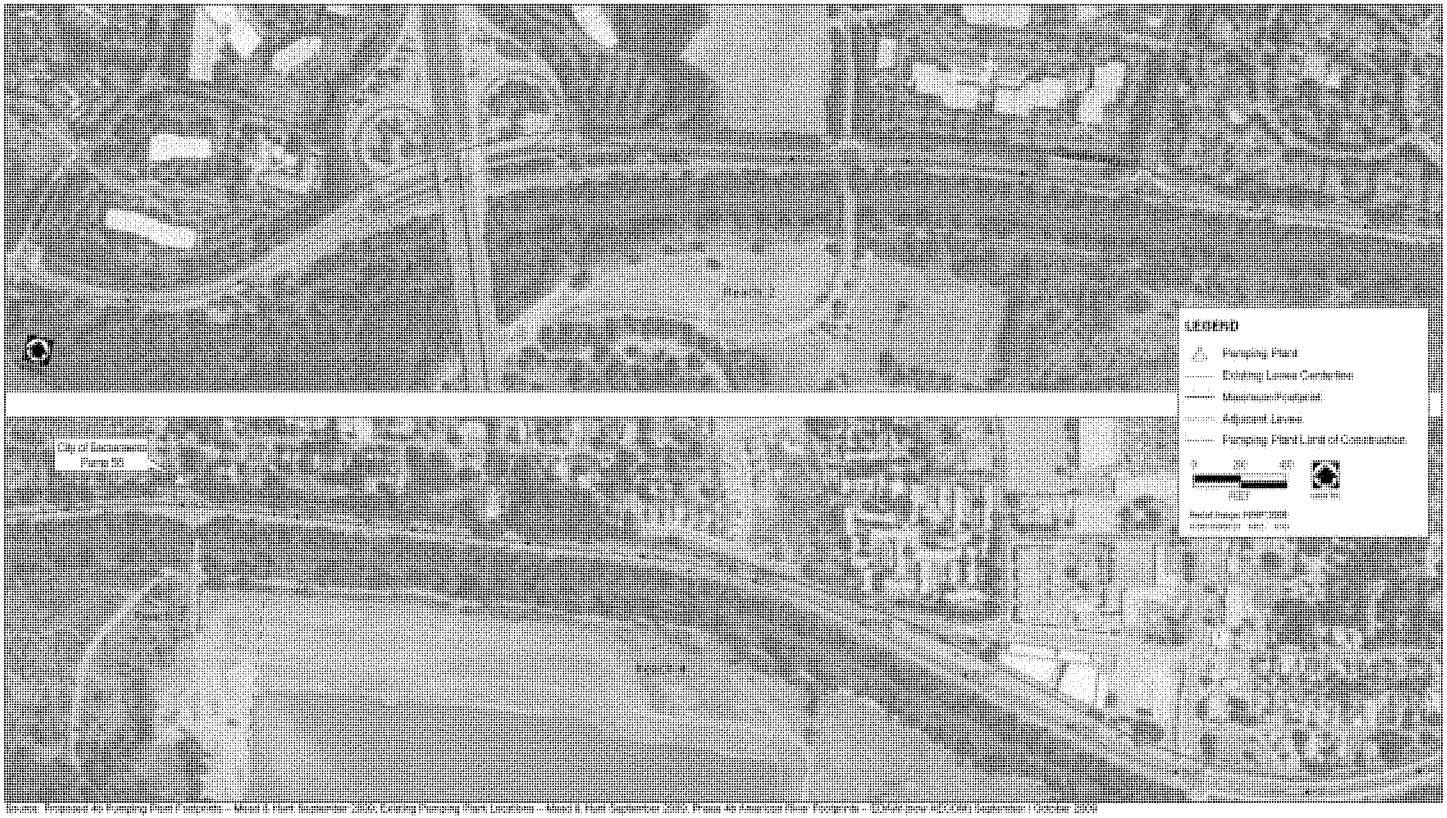
Source: HDR 2009

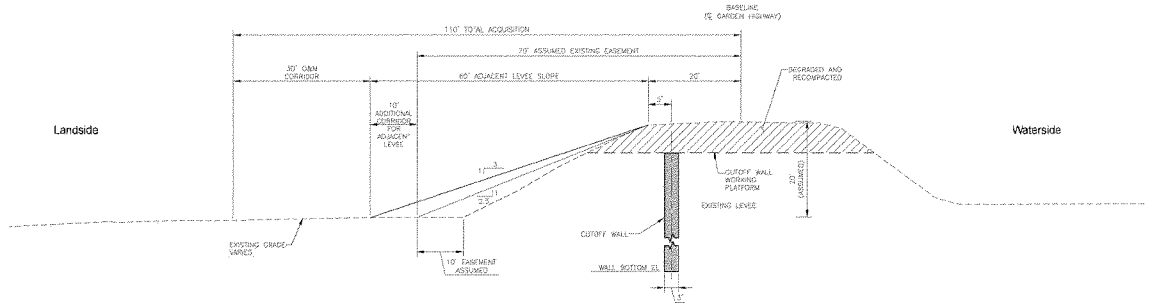
Cross-Sections – Sacramento River East Levee Reach A:19B–20

Plate 2-8d

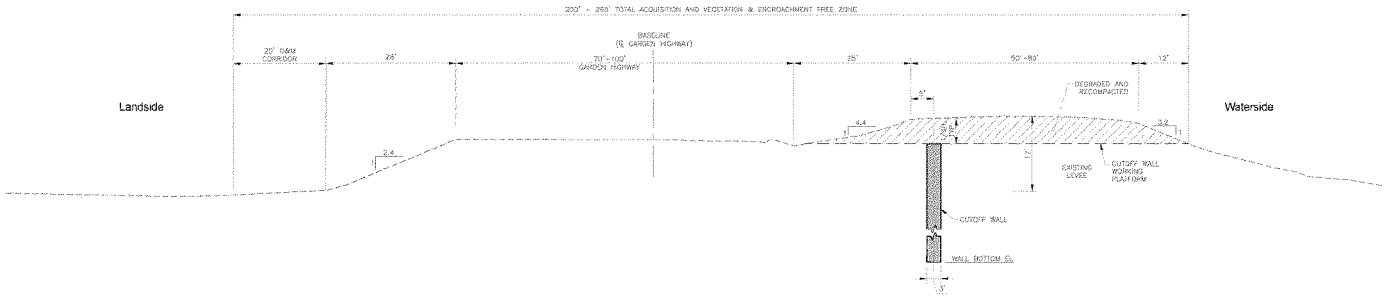


Proposed Phase 4b Project Features – American River North Levee Reach I:1–4

Plate 2-9



Reaches 1A, 1B (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall



Reaches 1B (partial), 2 (partial) – Existing Levee with Cutoff Wall

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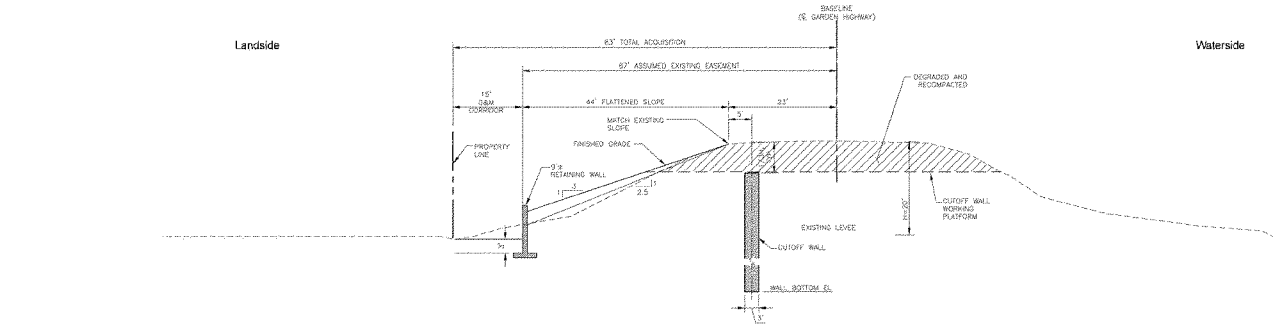
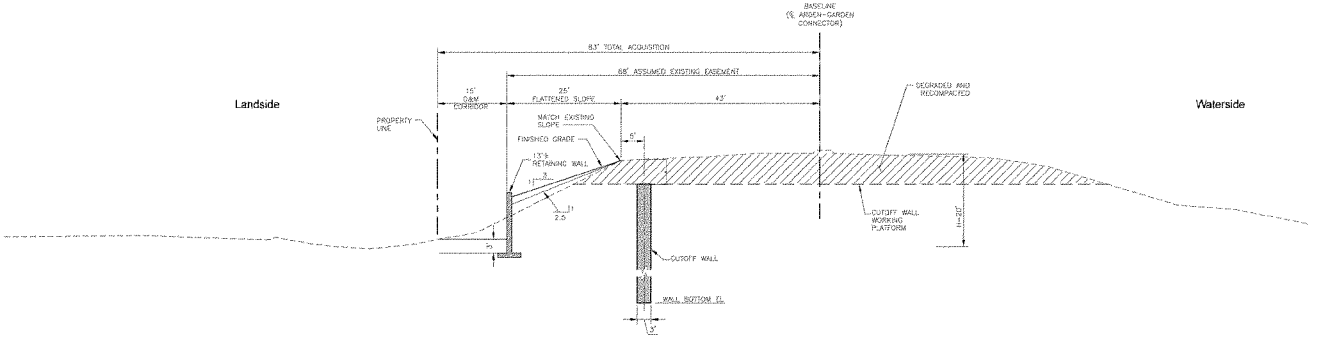
Source: HDR 2009

Cross-Sections – American River North Levee Reach I:1A–1B

Plate 2-10a



Reaches 2 (partial), 3, 4 (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall



Reaches 4 (partial) – 3:1 Slope Flattening with Cutoff Wall

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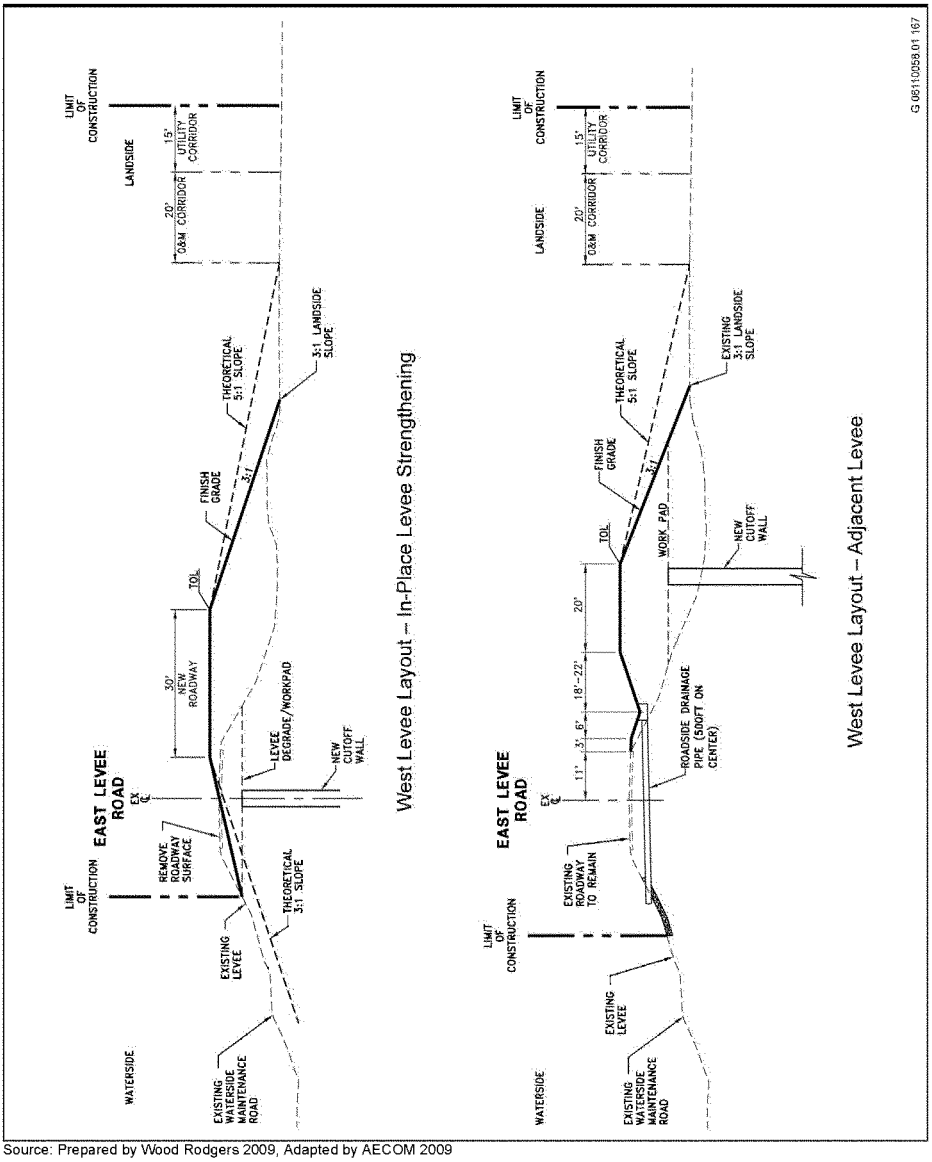
Source: HDR 2009

Cross-Sections – American River North Levee Reach I:2–4 **Plate 2-10b**

Proposed Phase 4b Project Features – Natomas East Main Drainage Canal (NEMDC) North **Plate 2-11**



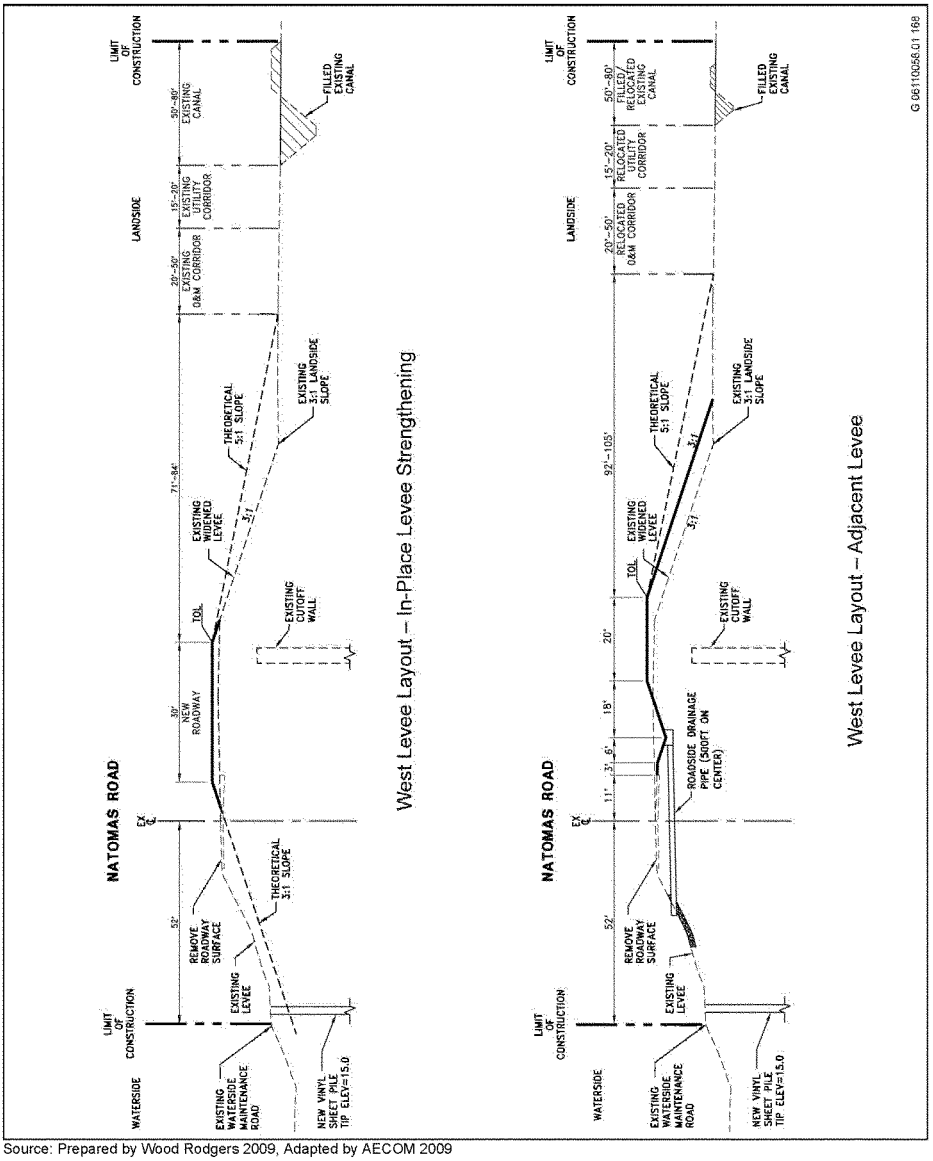
Source: Prepared by Wood Rodgers 2009, Adapted by AECOM 2009

Typical Cross-Sections – Natomas East Main Drainage Canal (NEMDC) North **Plate 2-12**

Proposed Phase 4b Project Features – Pleasant Grove Creek Canal (PGCC) **Plate 2-13**

Proposed Phase 4b Project Features – Natomas East Main Drainage Canal (NEMDC) South

Plate 2-14

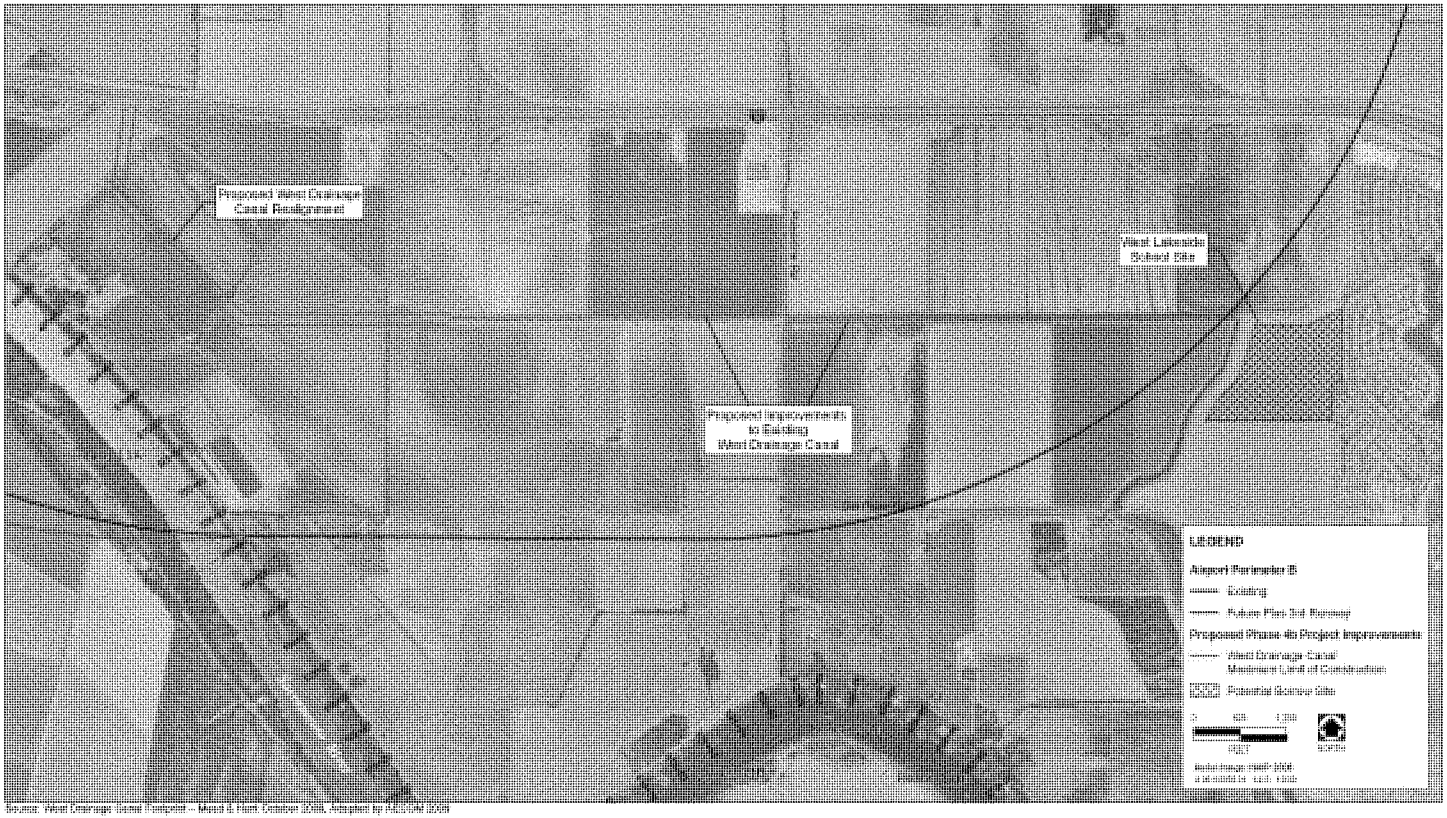


Source: Prepared by Wood Rodgers 2009, Adapted by AECOM 2009

Typical Cross-Sections – Pleasant Grove Creek Canal (PGCC) **Plate 2-15**

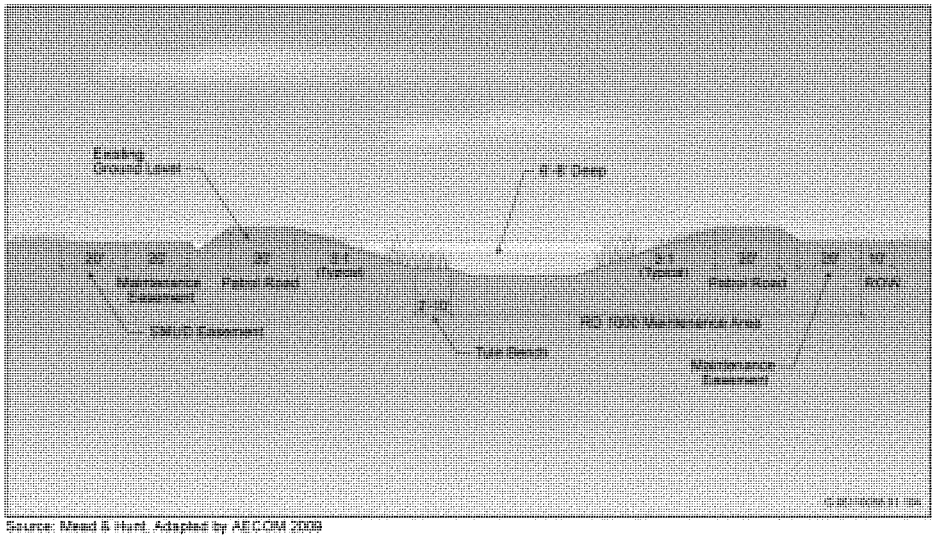
Proposed Phase 4b Project Features – Natomas Cross Canal (NCC)

Plate 2-16



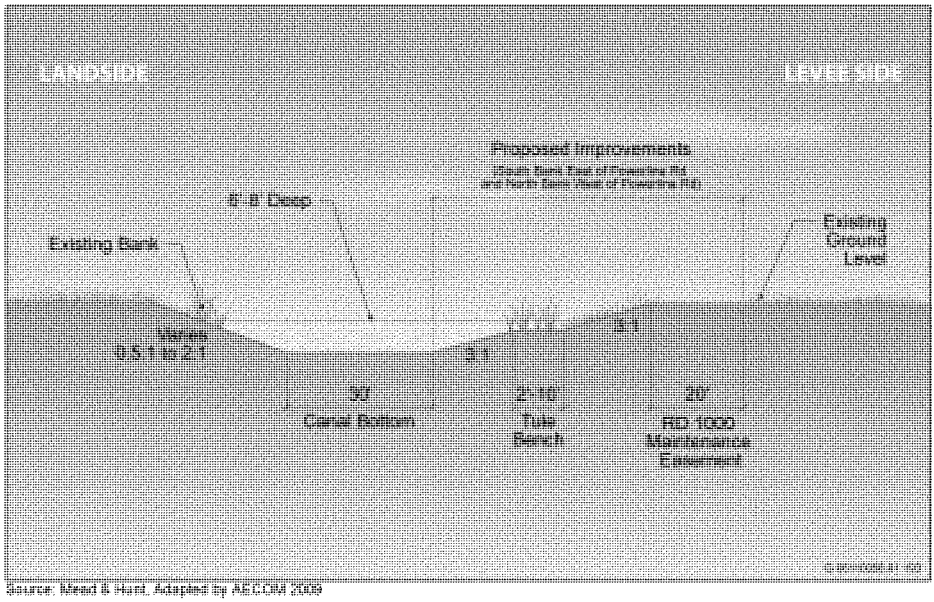
Source: West Drainage Canal Footprint – Mead & Hunt, October 2008, Adapted by ACCOM 2009

West Drainage Canal and West Lakeside School Site **Plate 2-17**



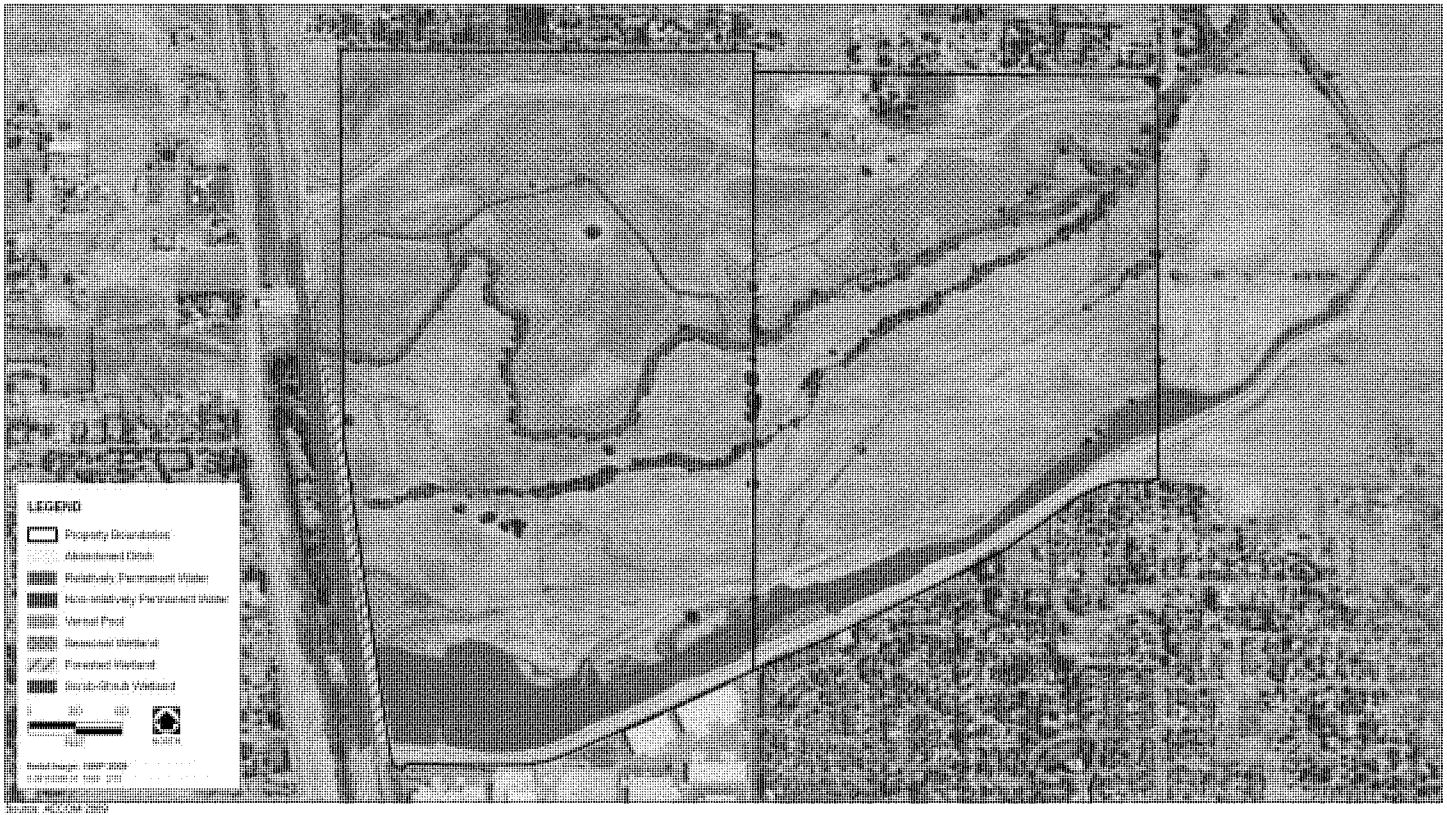
Source: Mead & Hunt, Adapted by AECOM 2009

Typical Cross Section – West Drainage Canal Realignment **Plate 2-18a**

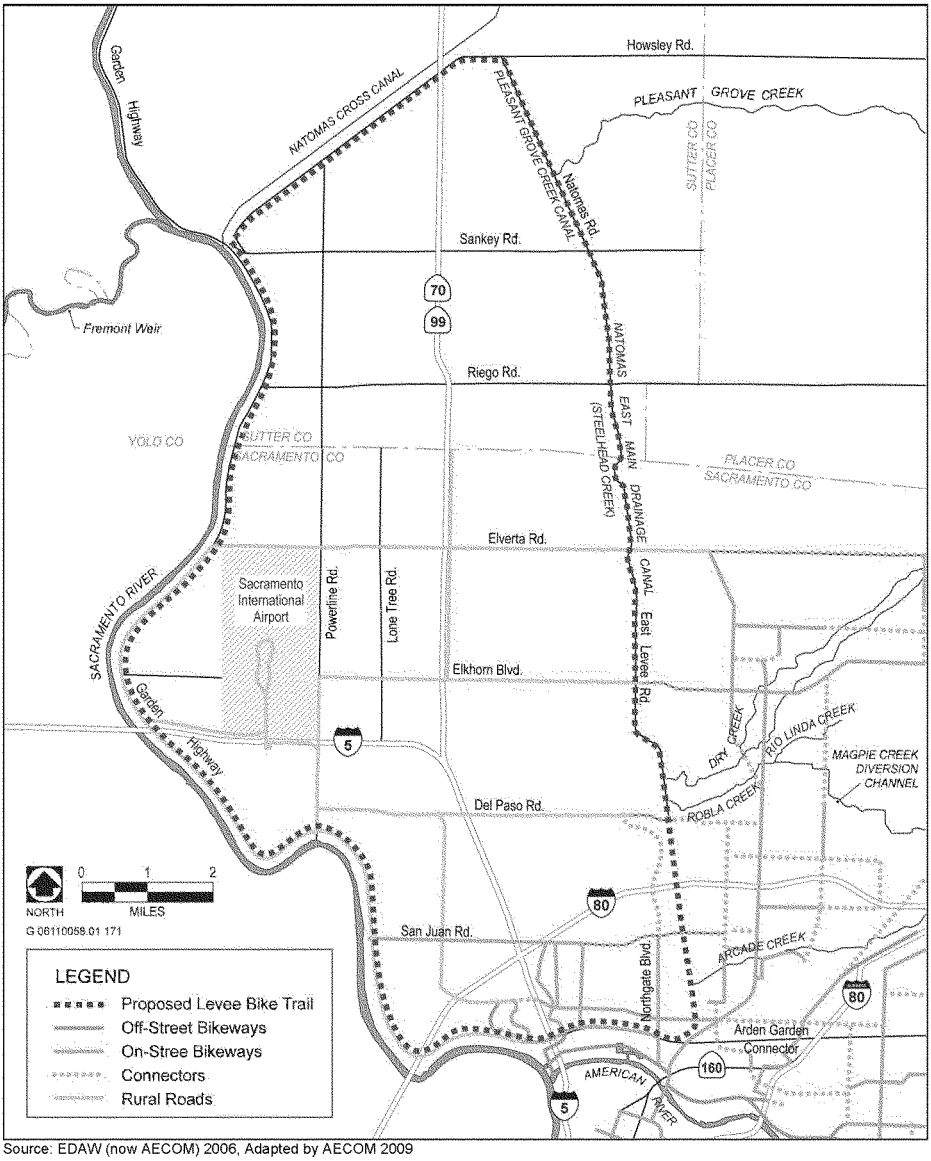


Source: Mead & Hunt, Adapted by AECOM 2009

Typical Cross Section – West Drainage Canal Improvements **Plate 2-18b**

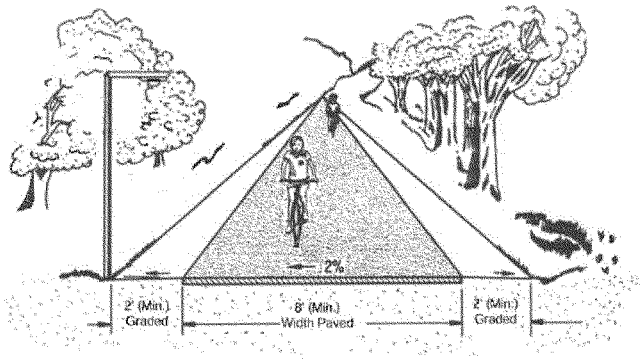


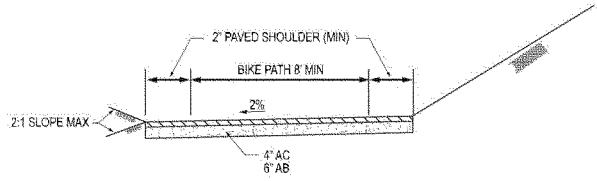
Potential Woodland Planting Area – Lower Dry Creek **Plate 2-19**



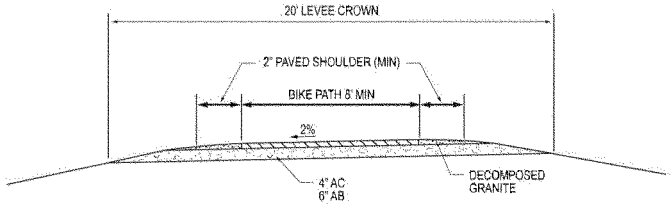
Source: EDAW (now AECOM) 2006, Adapted by AECOM 2009

Class I Bike Trail Region Map **Plate 2-20**





Typical Cross Section of Bike Path on Toe of the Levee

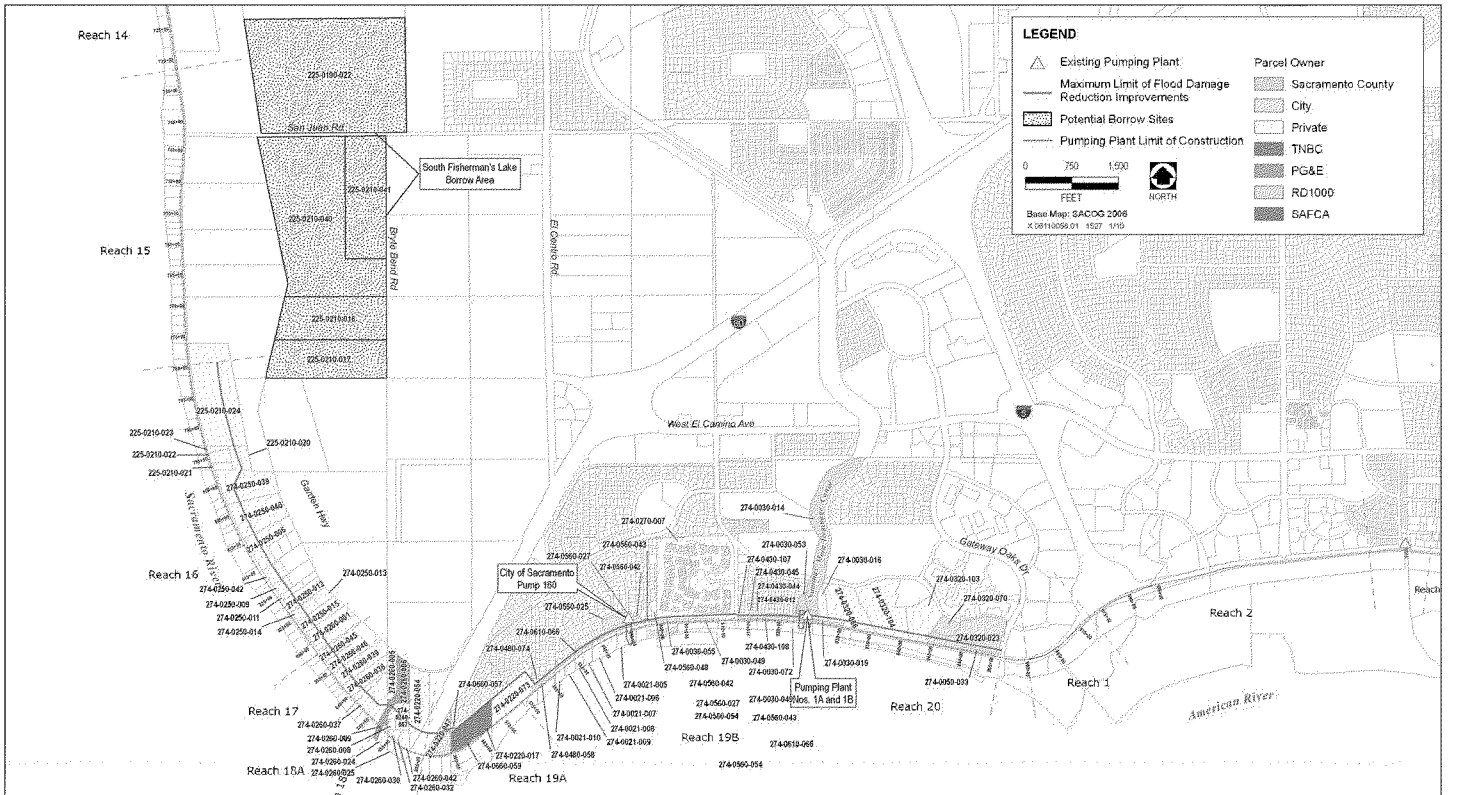


Typical Cross Section of Bike Path on Top of the Levee

G 06110058.01 170

Source: Basemap: CaSil; EDAW (now AECOM) 2006

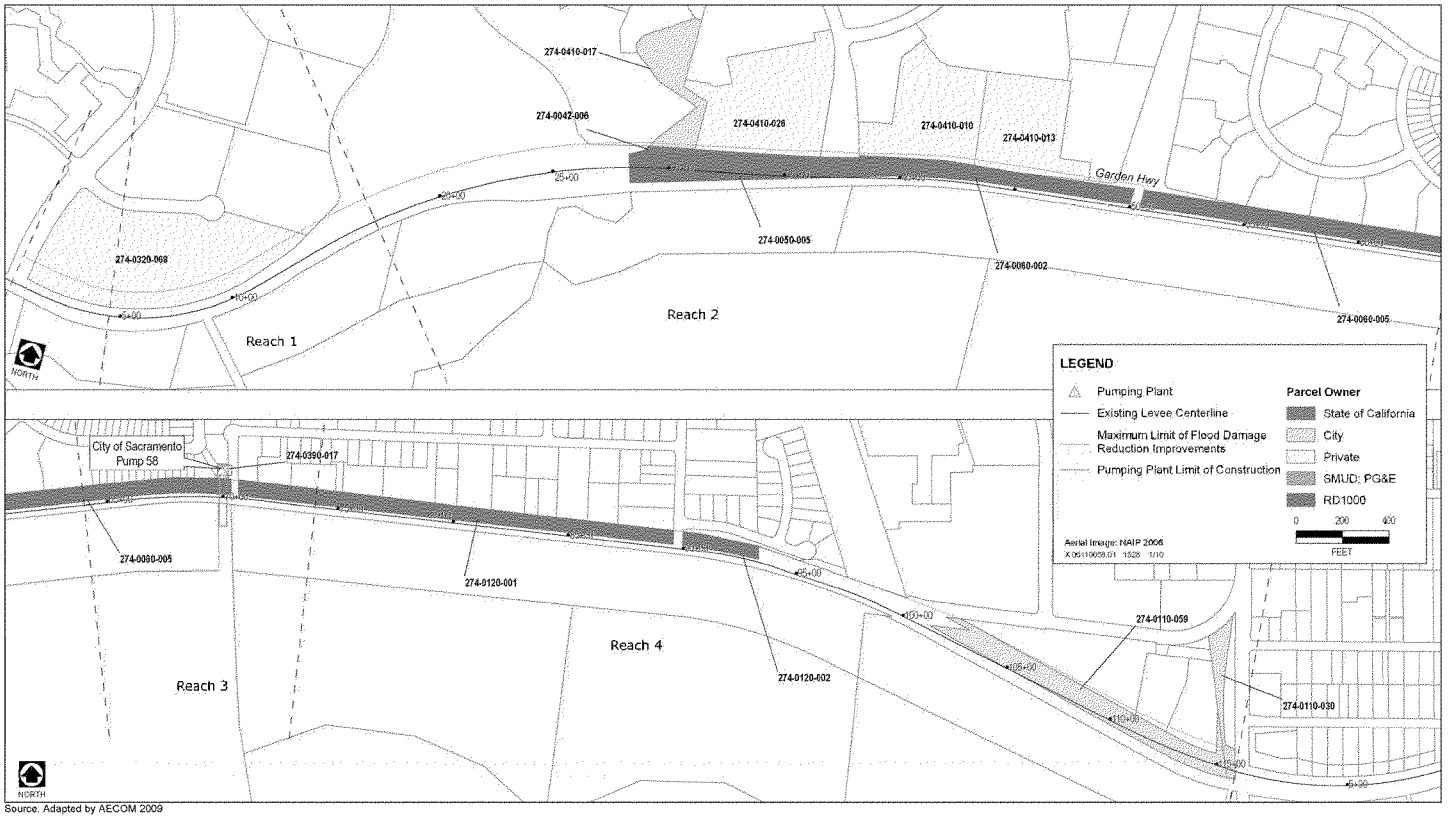
Bike Trail Concepts **Plate 2-21**



Source: Adapted by AECOM 2009

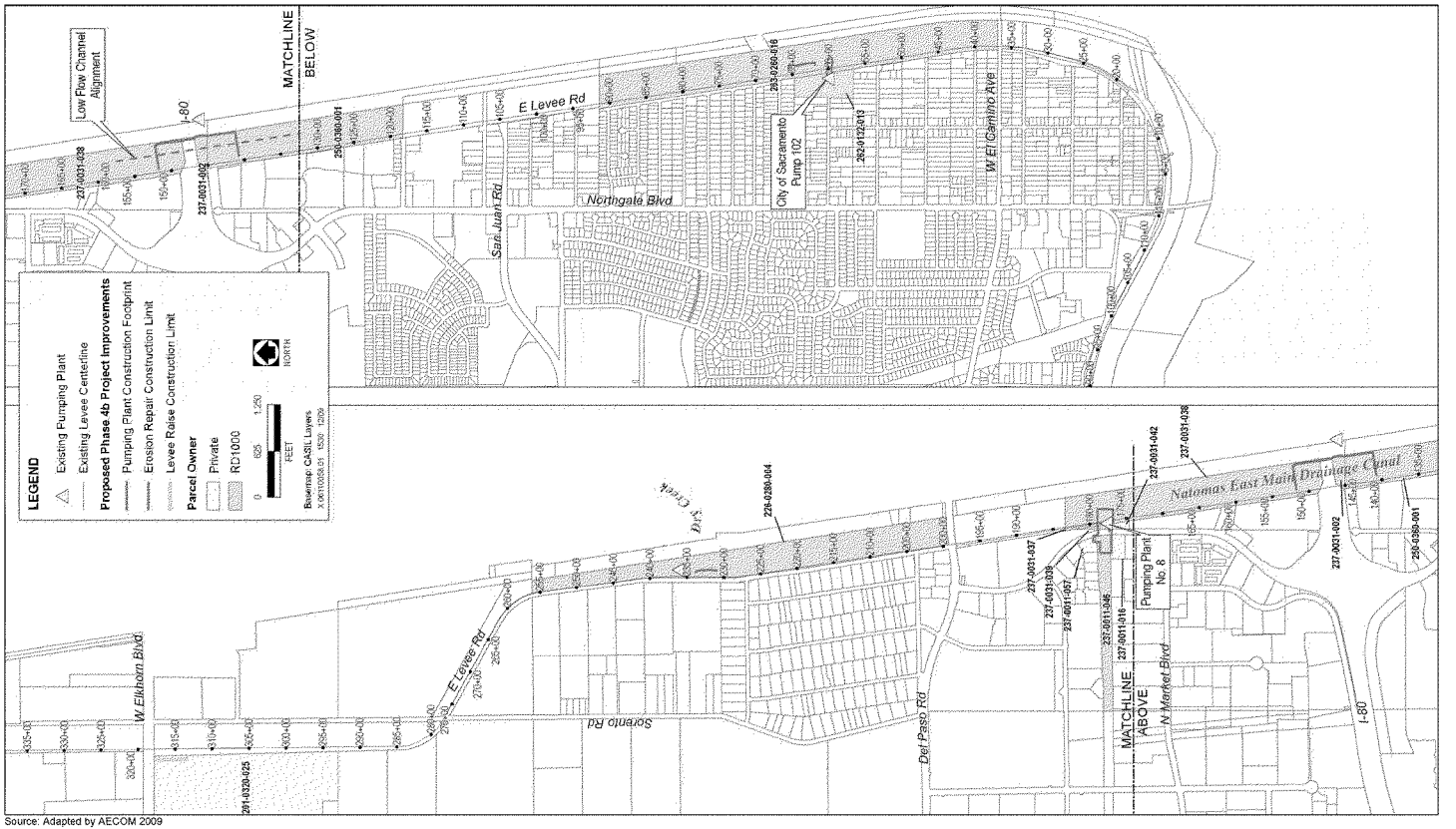
Land Ownership in the Proposed Phase 4b Project Footprint

Plate 2-22a



Source: Adapted by AECOM 2009

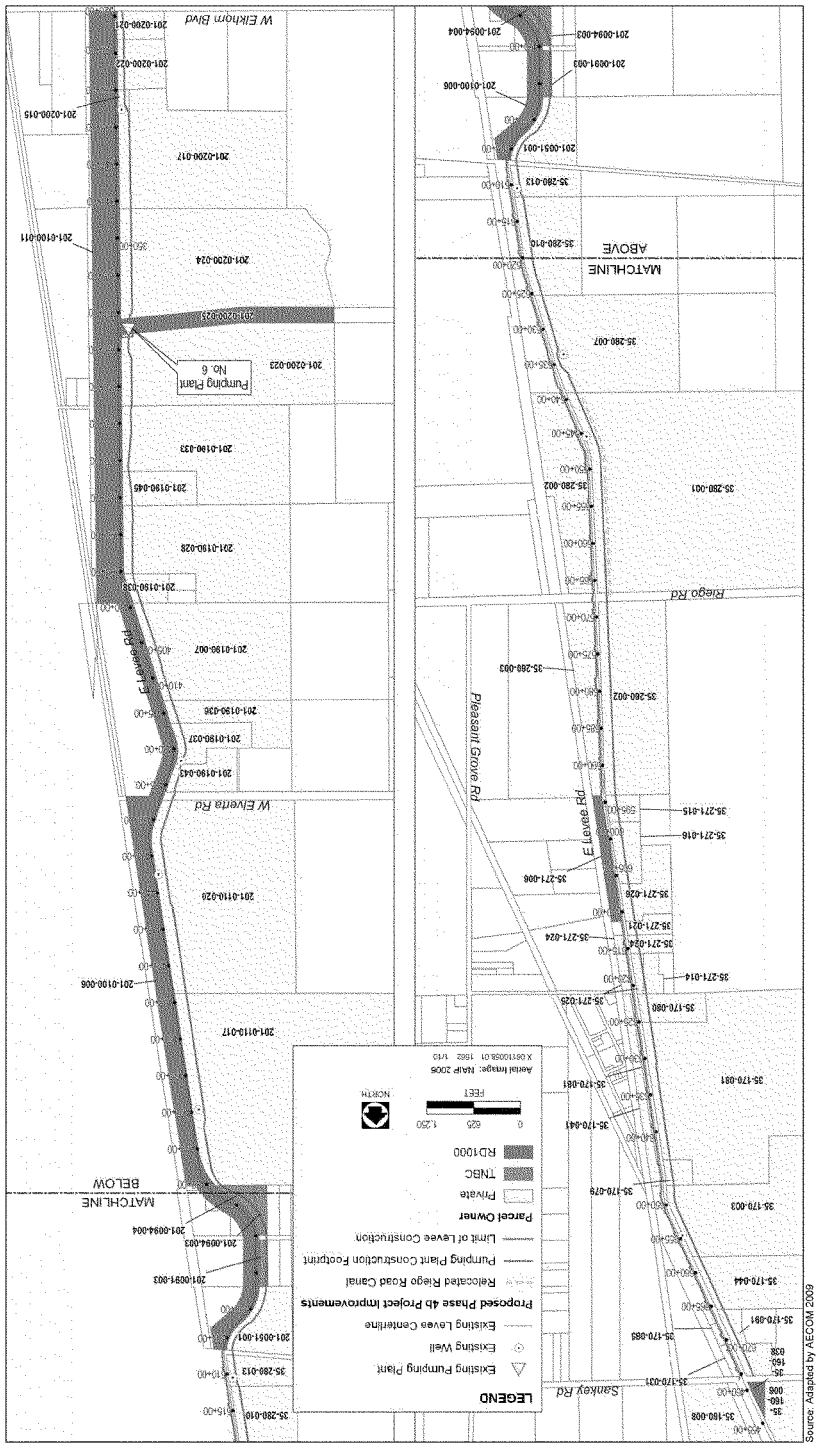
Land Ownership in the Proposed Phase 4b Project Footprint **Plate 2-22b**



Source: Adapted by AECOM 2009

Land Ownership in the Proposed Phase 4b Project Footprint

Plate 2-22c

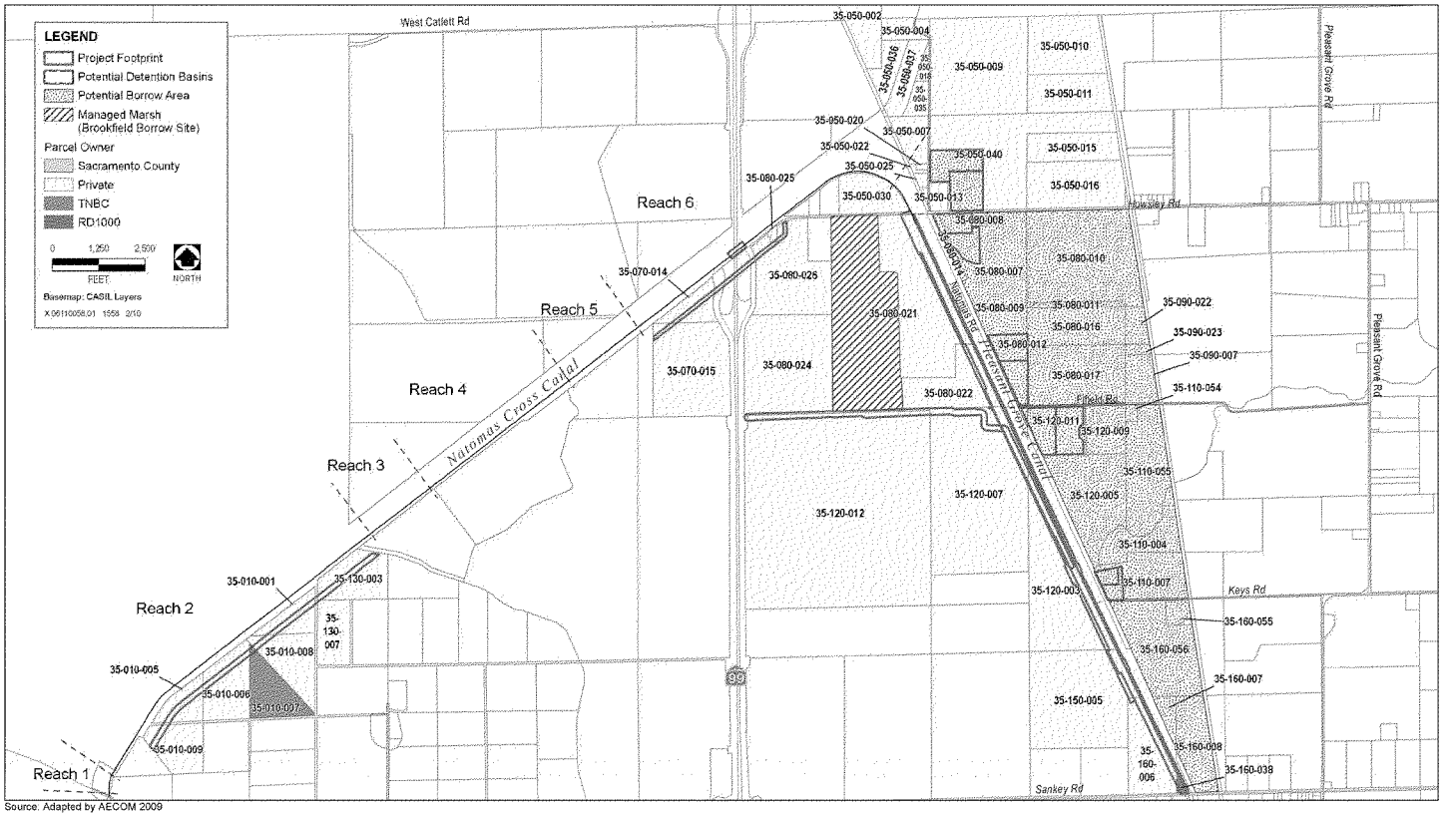


Land Ownership in the Proposed Phase 4b Project Footprint **Plate 2-22d**

Common Features/Natomas PAC/Phase 4b Project
USACE and SAFCA

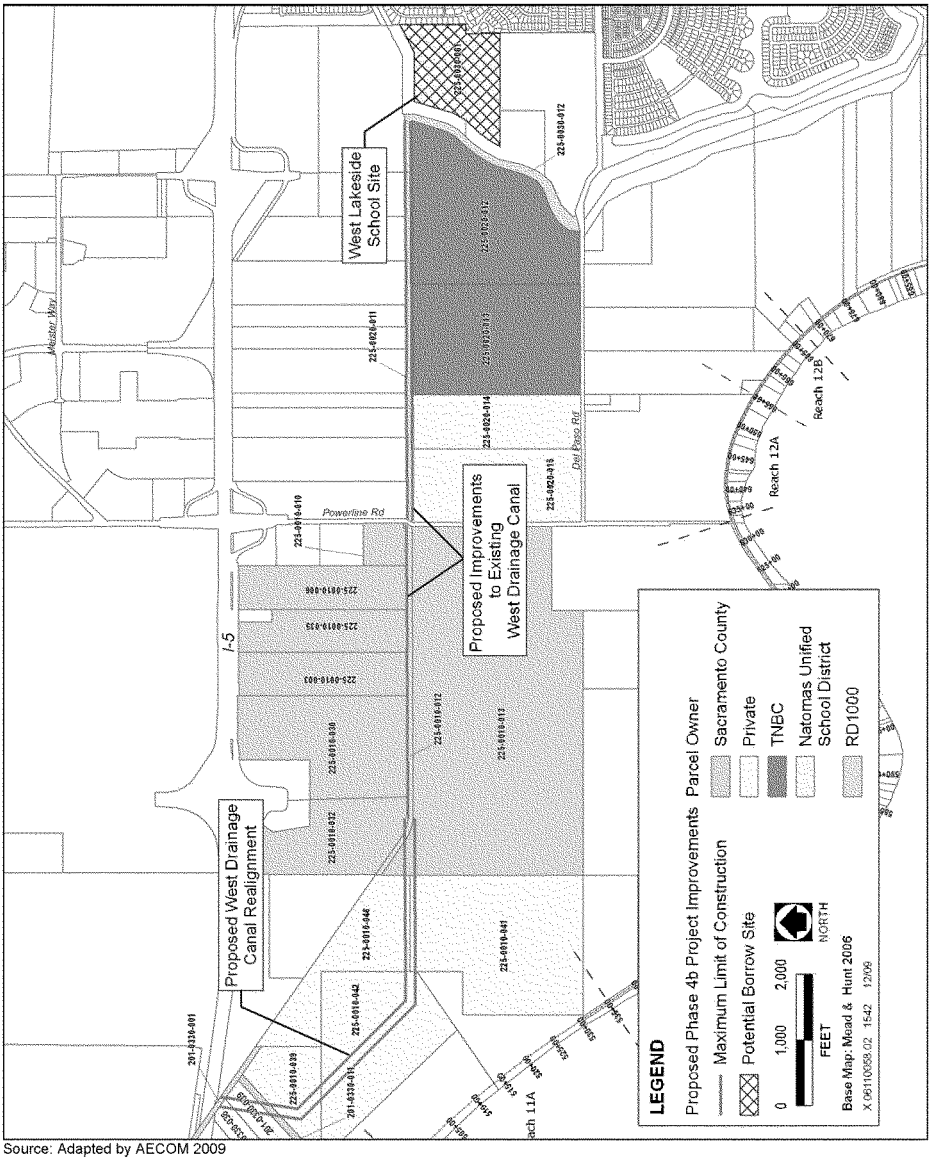
2-137

FEIS/FEIR
Plates



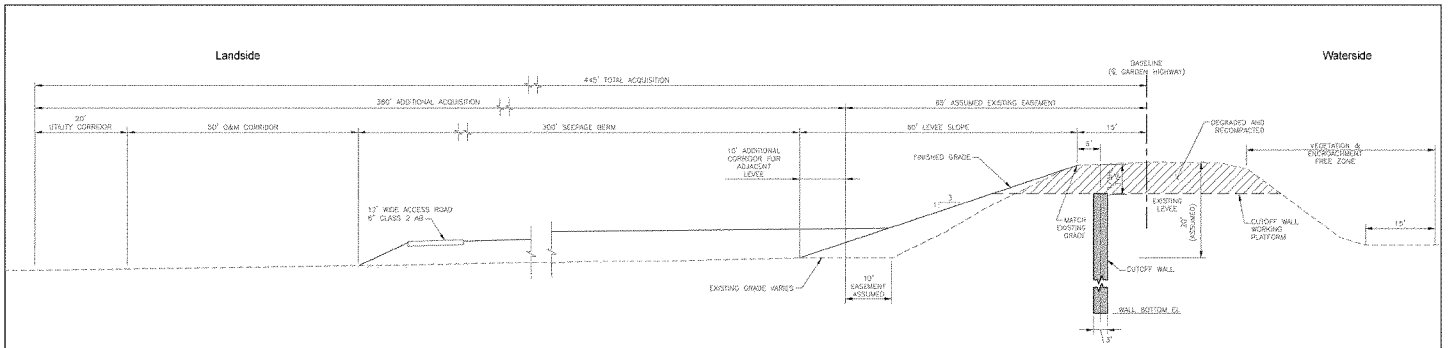
Source: Adapted by AECOM 2009

Land Ownership in the Proposed Phase 4b Project Footprint **Plate 2-22e**

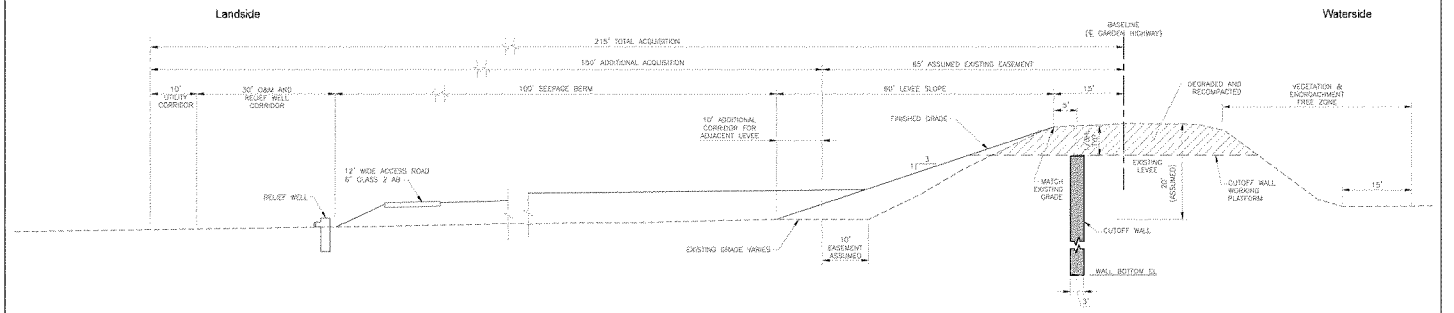


Source: Adapted by AECOM 2009

Land Ownership in the Proposed Phase 4b Project Footprint **Plate 2-22f**



Fix-in-Place Levee Section – Reaches 16 (partial) – 3:1 Slope Flattening, 300' Seepage Berm, Cutoff Wall



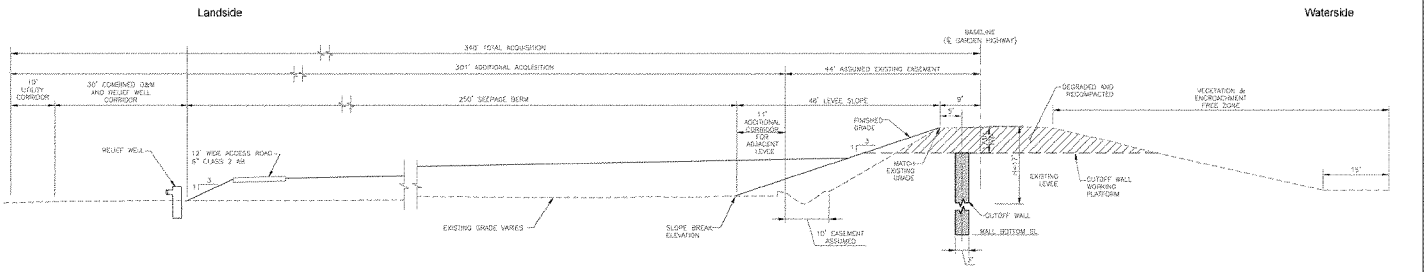
Fix-in-Place Levee Section – Reaches 16 (partial), 17, 18A – 3:1 Slope Flattening, 100' Seepage Berm, Cutoff Wall

G 06110056 01 217

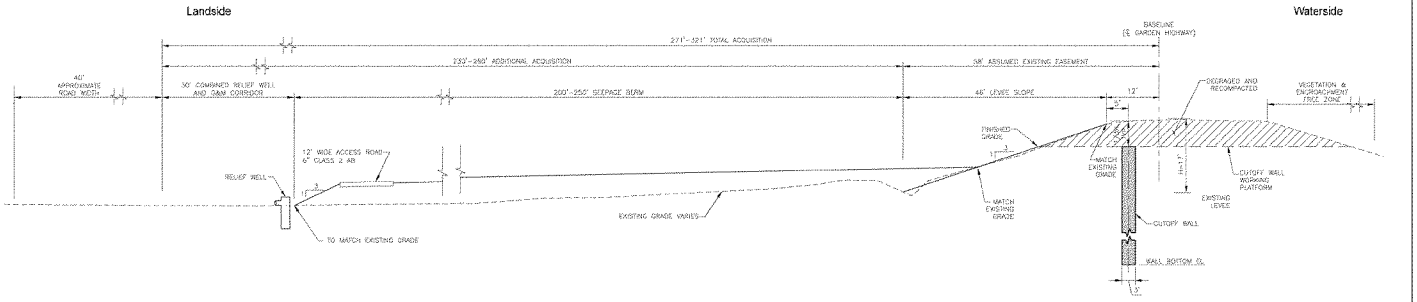
Source: HDR 2009

Cross-Sections – Fix-in-Place Levee Alternative

Plate 2-23a



Fix-in-Place Levee Section – Reaches 18B, 19A (partial) – 3:1 Slope with 300' Seepage Berm, Cutoff Wall, and Relief Wells



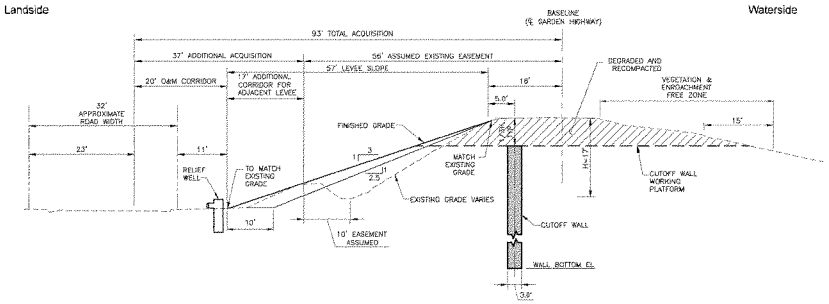
Fix-in-Place Levee Section – Reaches 19A (partial), 19B (partial) – 3:1 Slope Flattening with Seepage Berm, Cutoff Wall, and Relief Wells

G:\6110058.01 218

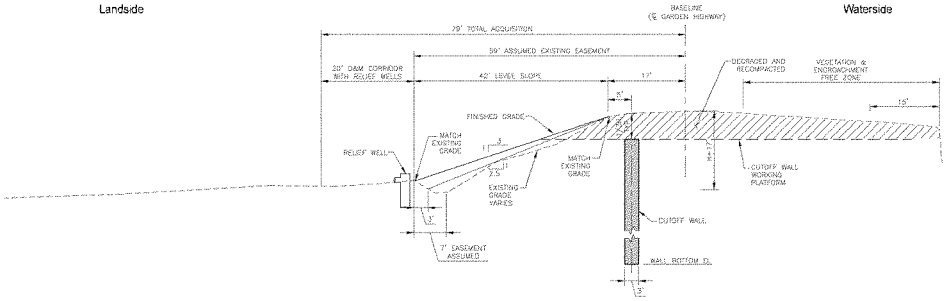
Source: HDR 2009

Cross-Sections – Fix-in-Place Levee Alternative

Plate 2-23b



Fix-in-Place Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall and Relief Wells



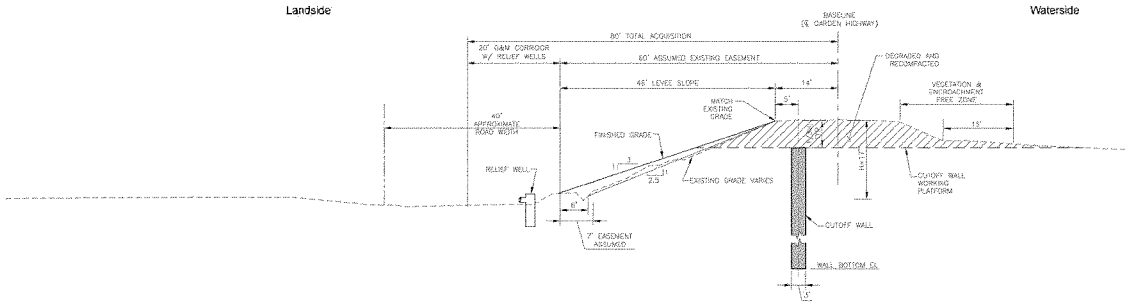
Fix-in-Place Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall and Relief Wells

G 08110058.01 219

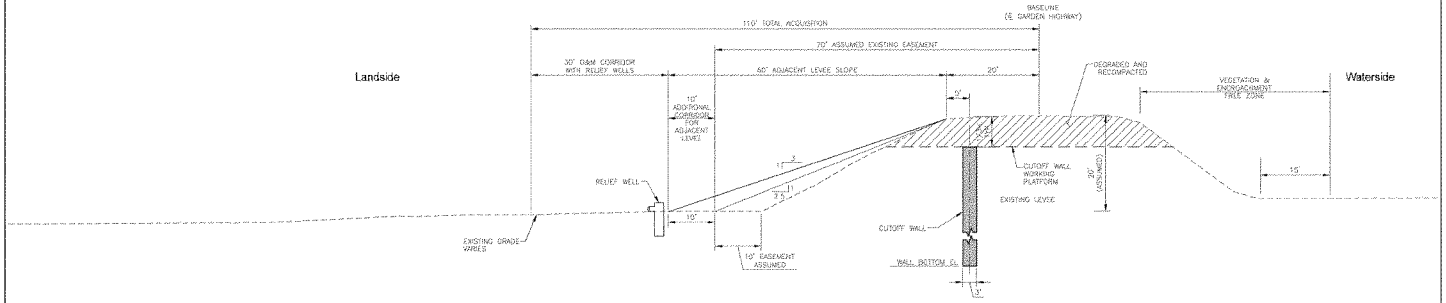
Source: HDR 2009

Cross-Sections – Fix-in-Place Levee Alternative

Plate 2-23c



Fix-in-Place Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall and Relief Wells



Fix-in-Place Levee Section – Reaches 19B (partial), 20 – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall and Relief Wells

G 06110058.01 220

Source: HDR 2009

Cross-Sections – Fix-in-Place Levee Alternative

Plate 2-23d

3 AFFECTED ENVIRONMENT

The baseline environmental conditions assumed in this EIS/EIR for analyzing the effects of the Phase 4b Project consist of the existing physical environment as of November 5, 2009, the date when SAFCA published the Phase 4b Project notice of preparation (NOP) to prepare an EIR and filed it with the State Clearinghouse.[1] Under CEQA, baseline environmental conditions are set at the time the NOP is published. Even though this chapter is titled "Affected Environment" for the purposes of NEPA, it also constitutes the "Environmental Setting" required under CEQA.

3.1 GENERAL SITE CONDITIONS

3.1.1 NATOMAS BASIN

The Natomas Basin (**Plate 1-1**) is located at the confluence of the American and Sacramento Rivers. Encompassing approximately 53,000 acres, the Basin extends northward from the American River and includes portions of the city of Sacramento, Sacramento County, and Sutter County. In addition to the American and Sacramento Rivers, the Natomas Basin is bordered on the north by the Natomas Cross Canal (NCC) and on the east by the Pleasant Grove Creek Canal (PGCC) and the Natomas East Main Drainage Canal (NEMDC) (also known as Steelhead Creek). The NCC diverts the runoff from a large watershed in western Placer and southern Sutter Counties around the Natomas Basin and is a contributor to the flows in the upper reach of the Sacramento River channel in SAFCA's jurisdiction. The NEMDC is an engineered channel along the southeastern flank of the Natomas Basin. Tributaries to the NEMDC include Dry Creek, Arcade Creek, Rio Linda Creek, Robla Creek, and Magpie Creek Diversion Channel. The Natomas Basin is protected from high flows in these water bodies and in the American and Sacramento Rivers by an interconnected perimeter levee system. This levee system was originally created to promote agricultural development. Today, however, the Natomas Basin contains three major public transportation facilities (Interstate 5 [I-5], Interstate 80 [I-80], and State Route [SR] 99) and is the site of the Sacramento International Airport (Airport). Airport lands account for a little over 10% of the total acreage in the Basin. Half of the Airport lands lie outside of the Airport Operations Area and consist of "bufferlands" managed as grassland open space (see **Plate 1-7**). About 30% of the Basin consists of developed urban uses, mostly located south of Elkhorn Boulevard in the city of Sacramento. The remaining 60% of the Basin is in some form of developed agricultural or open space use in unincorporated areas of Sacramento and Sutter Counties, including 4,000 acres under the management of The Natomas Basin Conservancy (TNBC) (see **Plate 1-8**).

The "Affected Environment" consists of the environmental setting for the entire Natomas Levee Improvement Program (NLIP) area. The NLIP area is the same as the "Natomas Basin." Both terms are used interchangeably in this EIS/EIR, but cover the same geography and consist of the same boundaries. The NLIP area also includes the Phase 4b Project area, the final phase of the NLIP Landside Improvements Project. The entire NLIP is addressed in the "Affected Environment," because this EIS/EIR not only supports implementation of the Phase 4b Project, but will also help support the approval of USACE's Common Features/Natomas PACR, described in Chapter 1, "Introduction and Statement of Purpose and Need."

3.1.2 LEVEE IMPROVEMENT AREAS

As described in Chapter 1, "Introduction and Statement of Purpose and Need," USACE has divided the flood damage reduction improvements within the Natomas Basin into nine reaches (Reaches A–I), as shown on **Plate 1-3**. USACE's reach designations differ from SAFCA's reach designations, which are more finely subdivided than the USACE system for the Sacramento River east levee, American River north levee, and NCC. In **Plate 1-3**, and

[1] As noted in Chapter 1, "Introduction," USACE published a notice of intent (NOI) to prepare an EIS for the Common Features GRR in the *Federal Register* (Vol. 73, No. 41) on February 29, 2008, which is serving as the NOI for the Phase 4b Project. Because SAFCA's NOP publication date is more recent, that is the baseline used in this EIS/EIR.

as listed below, lettered reaches follow the USACE designation, while numbered reaches follow the SAFCA designations:

- Sacramento River east levee: Reach A:16–20
- Sacramento River east levee: Reach B:5A–15
- Sacramento River east levee: Reach C:1–4B
- NCC: Reach D:1–7
- PGCC: Reach E: there are no SAFCA reaches, just station numbers
- NEMDC North: Reaches F–G
- NEMDC South: Reach H
- American River north levee: Reach I:1–4

3.1.2.1 NATOMAS CROSS CANAL SOUTH LEVEE

The NCC is a 5.3-mile-long channel that carries water from several tributary watersheds in western Placer County and eastern Sutter County to the Sacramento River. The NCC begins at the PGCC and East Side Canal and extends southwest to its confluence with the Sacramento River near the Sankey Road/Garden Highway intersection. During periods of flooding, the Sutter Bypass, Sacramento River, and NCC all contribute to increase water elevations that can affect the NCC levees. USACE has designated the NCC as Reach D (**Plate 1-3**). For engineering analysis purposes, SAFCA has divided the NCC levee into seven reaches, as shown in **Plate 1-3**. In the pre-NLIP project condition, much of the south levee contained a stability berm with an internal drainage system. Levee slopes were approximately 3H:1V on the waterside and 2H:1V on the landside, with an approximately 80- to 100-foot maintenance access area on the landside of the levee through most of the NCC's length. The Phase 2 Project widened the levee footprint by raising the levee, flattening the landside levee slope, and constructing a cutoff wall.

Farms and rural residences are located on both sides of the NCC, with rice the primary crop under cultivation. The Lucich North and Frazer Habitat Preserves, maintained by TNBC, lie south of the NCC south levee from the eastern end of Reach D:2 through the western end of Reach D:6. A few residences are situated 700–1,000 feet north of the NCC south levee in Reach D:1, and a few residences are situated 50–200 feet south and west of the levee along Reach D:6. At Reach D:7, a residence and several ranch buildings are situated within 25 feet of the levee's landside toe. Other nearby land uses include the Verona Village Resort, a small trailer campground, a marina, a restaurant, and a store on the west side of Garden Highway, approximately 660 feet southwest of the west end of the NCC levee at the north end of Reach C:1 of the Sacramento River east levee.

A drainage canal, referred to as the Vestal Drain, runs parallel to the NCC south levee through much of Reach D:2, approximately 100 feet from the landside levee toe. There is a private irrigation pump and irrigation canal at the landside levee toe in Reach D:1. Natomas Central Mutual Water Company's (NCMWC's) Bennett Pump Station and Reclamation District (RD) 1000's Pumping Plant No. 4 are located in Reach D:2, and the NCMWC Northern Pump Station is located in Reach D:3. NCMWC's North Main Canal runs parallel to the levee through Reach D:4–5, approximately 100 feet from the landside levee toe.

3.1.2.2 SACRAMENTO RIVER EAST LEVEE

Table 3.1-1 describes the areas along the Sacramento River east levee. The Phase 4b Project includes improvements to the Sacramento River east levee Reach A:16–20 only; however, all reaches are included in the table below for completeness and because these reaches are part of the Phase 2, 3, 4a, and 4b Projects.

3.1.2.3 PLEASANT GROVE CREEK CANAL WEST LEVEE

The area along the PGCC west levee contains primarily agricultural uses along with minimal industrial, manufacturing, and rural residential uses.

Table 3.1-1
Description of the Sacramento River East Levee Area by Reach and by Project Phase

Reach	Landside	Waterside
	Phase 2 Project	
C:1	Sankey Road intersects Garden Highway near the start of Reach C:1. Oak woodland and a rural residence are located approximately 3,000 feet south of the start of Reach C:1; the rural residence is located within 50 feet of the landside toe of the levee. Rice and field crops border the levee throughout the reach.	Verona Village Resort (a small trailer campground, marina, restaurant, and store) is located on the west side of Garden Highway bordering the start of the reach. Small clusters of woodland are scattered along Garden Highway to the south.
C:2	A rural residence adjacent to the existing levee is located approximately 1/3 mile south of the start of Reach C:2. Field crops border the levee throughout the reach. The northern part of the TNBC Huffman West Habitat Preserve borders the levee in the southern end of the reach.	Small clusters of woodland are scattered along Garden Highway. Eight residences are located at the end of Reach C:2 adjacent to Garden Highway.
C:3	A field used for row crops, part of the TNBC Huffman West Habitat Preserve, covers the entire reach.	Six residences are located adjacent to Garden Highway.
C:4A and 4B	Field crops or open space border the levee throughout the reach. Most of the parcels bordering the levee are TNBC land (Huffman West and Atkinson Habitat Preserves) or Airport land. Riego Road intersects Garden Highway approximately 1,500 feet from the start of Reach C:4A. Agricultural facilities at the end of a narrow paved road are located approximately 2,000 feet south of Riego Road. The RD 1000 Pumping Plant No. 2 is located on the North Drainage Canal. The Elkhorn Canal closely parallels the levee from the North Drainage Canal south. A highline canal perpendicular to the levee is located approximately 2,000 feet south of the North Drainage Canal. A cluster of woodlands is located just south of the canal. A line of trees perpendicular to the levee is located near the southern end of the reach.	Approximately nine residences, interspersed among woodland, are located adjacent to Garden Highway. Several docks and private marinas, including the Rio Ramaza Marina, are located along the bank. The NCMWC's Prichard Lake Pumping Plant and pump tender's residence are located at the North Drainage Canal.
	Phase 3 Project	
B:5A and 5B	Field crops and idle Airport north bufferlands border the levee throughout the reach on Airport land. A cluster of woodlands is located at the start of the reach. A rural residence with outbuildings and surrounding woodland is located approximately 1,600 feet south of the start of the reach. West Elverta Road intersects Garden Highway approximately 1,500 feet north of the end of the reach. The Elkhorn Canal closely parallels the levee throughout the reach.	Woodland covers the entire reach west of Garden Highway.
B:6A and 6B	Field crops border the levee throughout the reach. The West Drainage Canal, which borders Teal Bend Golf Club on the north, intersects the levee approximately 1,400 feet south of the orchard. Reservoir Road intersects Garden Highway approximately 1,000 feet south of the West Drainage Canal. Teal Bend Golf Club covers the remaining 2,800 feet of the reach. The Elkhorn Canal closely parallels the levee throughout the reach.	Approximately eight residences, interspersed among woodland, are located adjacent to Garden Highway. Several docks are located along the bank. NMCWC's Elkhorn Pumping Plant is located at the start of Reach B:6A.
B:7	Teal Bend Golf Club extends approximately 600 feet beyond the start of the reach. Field crops border the levee for the remaining 2,400 feet of the reach. The Elkhorn Canal closely parallels the levee throughout the reach.	Approximately 14 residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.

Table 3.1-1
Description of the Sacramento River East Levee Area by Reach and by Project Phase

Reach	Landside	Waterside
B:8	Field crops border the levee throughout the reach. A rural residence with outbuildings and surrounding woodland is located at the start of the reach. Another rural residence with outbuildings and surrounding woodland is located approximately 1,200 feet south of the first residence. West Elkhorn Boulevard intersects Garden Highway approximately 800 feet north of the end of the reach. A woodland cluster is located at the end of the reach. The Elkhorn Canal closely parallels the levee throughout the reach, ending approximately 1,200 feet south of Elkhorn Boulevard.	Approximately eight residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.
B:9A and 9B	A woodland cluster is located approximately 1,300 feet south of the start of the reach. Two rural residences are located within 1,000 feet of Bayou Road and the I-5 overpass. A woodland cluster is located on the south side of the I-5 overpass. Another woodland cluster is located approximately 700 feet farther south. A woodland cluster is located at the end of Reach B:9. Field crops border the levee throughout the reach.	Approximately 10 residences are located adjacent to Garden Highway interspersed among woodland. Several private docks are located along the bank. Two restaurant/marina facilities are located within 800 feet of the intersection of Bayou Road and Garden Highway. The Elkhorn Boat Launch Facility operated by Sacramento County Regional Parks Department is located adjacent to the marinas.
	Phase 4a Project	
B:10	A rural residence is located at the start of the reach. A woodland cluster is located approximately 1,100 feet farther south. A large ranch occupies Reach B:10 from approximately 1,700 feet south of the start of the reach to the end of the reach. Field crops border the levee throughout the reach. RD 1000's Pumping Plant No. 5 is located in the middle of the reach.	Approximately five residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.
B:11A and 11B	Reach B:11 contains the remaining 400 linear feet of the large ranch in Reach B:10. Field crops border the levee throughout the reach. A rural residence is located approximately two-thirds mile from the start of Reach B:11. Another rural residence is located another 2,000 feet south. Approximately 1/2-mile farther south, the river bends to the east. A cluster of trees is located approximately 1,600 feet west of the end of the reach. Field crops border the levee throughout the reach. RD 1000's Pumping Plant No. 3 is located within the reach.	Approximately 12 residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.
B:12	An orchard covers much of Reach B:12, at which point the river trends south again. A rural residence is located approximately one-half mile south of the start of the reach. A rural residence and the Kimura Ditch are located 500–700 feet north of the end of the reach, followed by two more residences. A highline ditch starts at the Kimura Ditch and closely parallels the levee to the south. Field crops border the levee throughout the reach.	Approximately 14 residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.
B:13	A residence is located at the start of Reach B:13. Pumping Plant No. 3 and a large drainage ditch perpendicular to the levee are located 800 feet south of the start of the levee. Another 1,400 feet farther south is a woodland cluster. A highline ditch closely parallels the levee for the length of the reach. Field crops border the levee throughout the reach. The TNBC Cummings preserve includes mitigation plantings for valley elderberry longhorn beetle.	Approximately 13 residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.

Table 3.1-1
Description of the Sacramento River East Levee Area by Reach and by Project Phase

Reach	Landside	Waterside
B:14	Radio Road intersects Garden Highway approximately 1,600 feet south of the start of Reach B:14 at the end of a large field used for row crops. A rural residence is located approximately 800 feet farther south. The southern part of the reach is bordered by the TNBC Alleghany preserve.	Approximately 14 residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank. NCMWC's Riverside Pumping Plant is located in the middle of the reach.
B:15	Reach B:15 starts at the intersection of San Juan Road and Garden Highway. Two residential estates are located 600 and 1,200 feet farther south. Scattered trees are located adjacent to the levee. The northern part of the reach is bordered by the TNBC Alleghany preserve.	Approximately 21 residences, interspersed among woodland, are located adjacent to Garden Highway. More than a dozen private docks are located along the bank.
	Phase 4b Project	
A:16	Eight rural residences amid scattered trees are located in the first 1,600 feet of Reach A:16. The next 2,000 feet are a mixture of open fields, rural residences, farm buildings, and scattered trees. Dense woodland makes np the remaining 1,200 feet of the reach. The reach contains approximately 20 residences.	Approximately 12 residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.
A:17	A rural residence is located at the start of Reach A:17, approximately 600 feet inland from the levee toe. A rural residence with outbuildings is located approximately 800 feet south of the start of the reach.	Approximately seven residences, interspersed among woodland, are located adjacent to Garden Highway. Several private docks are located along the bank.
A:18	Reach A:18 contains four to five rural residences among small orchards north of the I-80 overcrossing. A woodland cluster is located on the east side of the I-80 overcrossing, where the river bends east.	Approximately six residences, interspersed among woodland, are located northwest of the I-80 overcrossing, adjacent to Garden Highway. Several private docks are located along the bank.
A:19A and 19B	Two rural residences are located within 800 feet of the start of Reach A:19, with scattered trees along and adjacent to the levee. The rest of the reach contains a subdivision of several hundred homes, the Swallows Nest Golf Course and condominium complex, and a subdivision of approximately 90 residential nnits. Scattered trees are located on or adjacent to the levee. The City of Sacramento's Willow Creek Pump Station is located in Reach A:19B.	Sand Cove Park (37 acres) is located southeast of the I-80 overcrossing. Woodland occupies the first 1,700 feet of Reach A:19. The remaining mile to the east is a mixture of residences, private docks, and businesses, including the River View Marina and the City of Sacramento's Willow Creek Pump Station in Reach A:19B.
A:20A and 20B	Reach A:20 contains an office park and the 13-acre Natomas Oaks Park. Scattered trees are located on or adjacent to the levee. RD 1000's Pumping Plant No. 1 is located in Reach A:20A.	The first 2/3-mile east of Reach A:19 contains a mixture of homes, private docks, and businesses, including the Riverbank Marina. The remaining 2,000 feet contains Discovery Park woodland and RD 1000 Pump Plant No. 1 in Reach A:20A.

Notes: I-5 = Interstate 5; I-80 = Interstate 80; NCMWC = Natomas Central Mutual Water Company; RD = Reclamation District; TNBC = The Natomas Basin Conservancy
Source: Data compiled AECOM in 2009

3.1.2.4 NATOMAS EAST MAIN DRAINAGE CANAL WEST LEVEE

The area west of and adjacent to the NEMDC ranges from agricultural uses to the north to urban uses to the south. The area adjacent to the northern portion of the NEMDC, between Sankey Road and Elkhorn Boulevard, contains primarily agricultural uses with scattered farm residences and associated structures. The area between Elkhorn Boulevard and Del Paso Road contains agricultural uses with scattered large-lot residential. South of Del Paso

Road and north of San Juan Road, land uses are more urbanized with a mix of commercial, business parks, and manufacturing uses. The area south of San Juan Road is primarily single-family residential.

3.1.2.5 AMERICAN RIVER NORTH LEVEE

Along the American River north levee, land uses are primarily residential, office, and commercial. Residences and businesses are located on the landside of the American River north levee. Between Folsom Dam and the confluence with the Sacramento River, the lower American River is bordered by the American River Parkway. The parkway is flanked by homes and businesses along the riverbanks and levees.

3.1.3 REGULATORY SETTING

The "Regulatory Setting," section in each issue area contains the Federal, state, regional, and local laws, regulations, plans, and ordinances that are relevant to the NLIP, including the Phase 4b Project. Although USACE is the project proponent, where state laws or regional/local plans or ordinances have requirements in addition to, but not conflicting with NEPA, the Federal agency (USACE) must fulfill those requirements.

3.2 AGRICULTURAL RESOURCES

3.2.1 REGULATORY SETTING

3.2.1.1 FEDERAL

The following Federal law related to agricultural resources is relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Farmland Protection Policy Act.

3.2.1.2 STATE

California Important Farmland Inventory System and Farmland Mapping and Monitoring Program

The California Department of Conservation, Office of Land Conservation, maintains a statewide inventory of farmlands. These lands are mapped by the Division of Land Resource Protection as part of the Farmland Mapping and Monitoring Program (FMMP). The maps are updated every 2 years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance. Farmlands are divided into the following five categories based on their suitability for agriculture:

- **Prime Farmland**—land that has the best combination of physical and chemical characteristics for crop production. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed.
- **Farmland of Statewide Importance**—land other than Prime Farmland that has a good combination of physical and chemical characteristics for crop production.
- **Unique Farmland**—land that does not meet the criteria for Prime Farmland or Farmland of Statewide Importance, but that has been used for the production of specific crops with high economic value.
- **Farmland of Local Importance**—land that is either currently producing crops or has the capability of production, but that does not meet the criteria of the categories above.

- **Grazing Land**—land on which the vegetation is suited to the grazing of livestock.

These categories are sometimes referred to as Important Farmland. Other categories used in the FMMP mapping system are "urban and built-up lands," "lands committed to nonagricultural use," and "other lands" (land that does not meet the criteria of any of the other categories).

Much of the farmland in the Natomas Basin is designated by the FMMP as Prime Farmland and Farmland of Statewide Importance (California Department of Conservation 2008). **Plate 3-1** shows the designated farmland within and surrounding the Natomas Basin according to the latest data available from FMMP.

California Land Conservation Act of 1965 (Williamson Act)

The California Land Conservation Act of 1965, commonly known as the Williamson Act (California Government Code Section 51200 et seq.), enables local governments to enter into contracts with private landowners for the purpose of promoting the continued use of the relevant land in agricultural or related open space use. In return, landowners receive property tax assessments that are based on farming and open space uses instead of full market value. Local governments receive an annual subvention (subsidy) of forgone property tax revenues from the state via the Open Space Subvention Act of 1971. Amendments to the California State Budget Act of 2009 greatly reduced the Williamson Act Subvention payments, but the Williamson Act Program remains in place and contracts remain in effect.

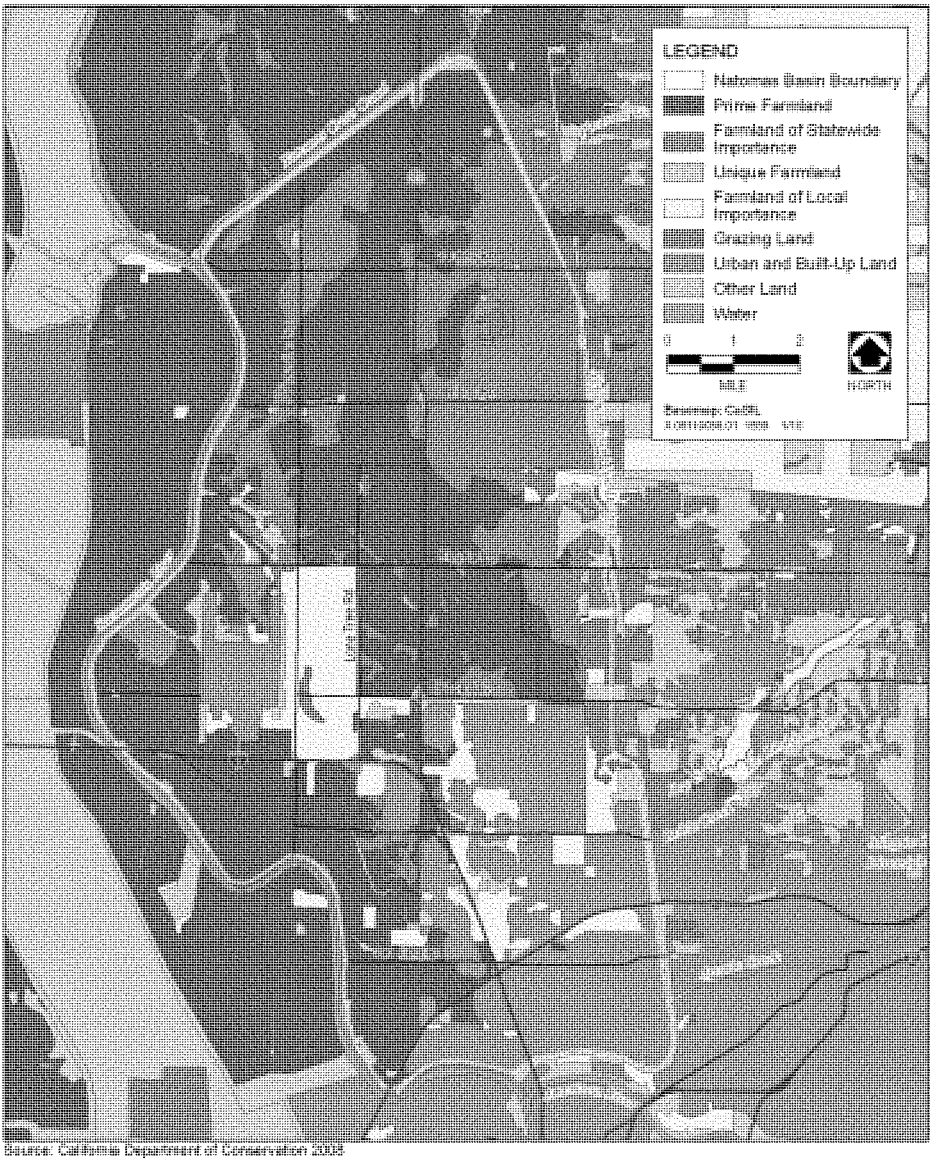
The Williamson Act empowers local governments to establish "agricultural preserves" consisting of lands devoted to agricultural uses and other compatible uses. Upon establishment of such preserves, the locality may offer to owners of included agricultural land the opportunity to enter into annually renewable contracts that restrict the land to agricultural use for at least 10 years (i.e., the contract continues to run for 10 years following the first date upon which the contract is not renewed). In return, the landowner is guaranteed a relatively stable tax rate, based on the value of the land for agricultural/open space use only and unaffected by its development potential.

As a public agency that may acquire lands within agricultural preserves, including lands under contract, the project proponent(s) is exempt from the normal cancellation process for Williamson Act contracts, because the contract is nullified for the portion of the land actually acquired (California Government Code Section 51295). The project proponent(s) must provide notice to the California Department of Conservation prior to acquiring such lands (California Government Code Section 51291[b]). A second notice is required within 10 working days after the land is actually acquired (California Government Code Section 51291[c]). As the land would be acquired for flood damage reduction measures, the project proponent(s) is exempt from the findings required in California Government Code Section 51292 (California Government Code Section 51293[c][1]) because the proposed project consists of flood damage reduction works. The preliminary notice to the California Department of Conservation, provided before lands are actually acquired, would demonstrate the purpose of the project and the exemption from the findings.

Much of the farmland in the Natomas Basin is in an agricultural preserve, with portions of those lands currently held in Williamson Act Contracts **(Plate 3-2)**.

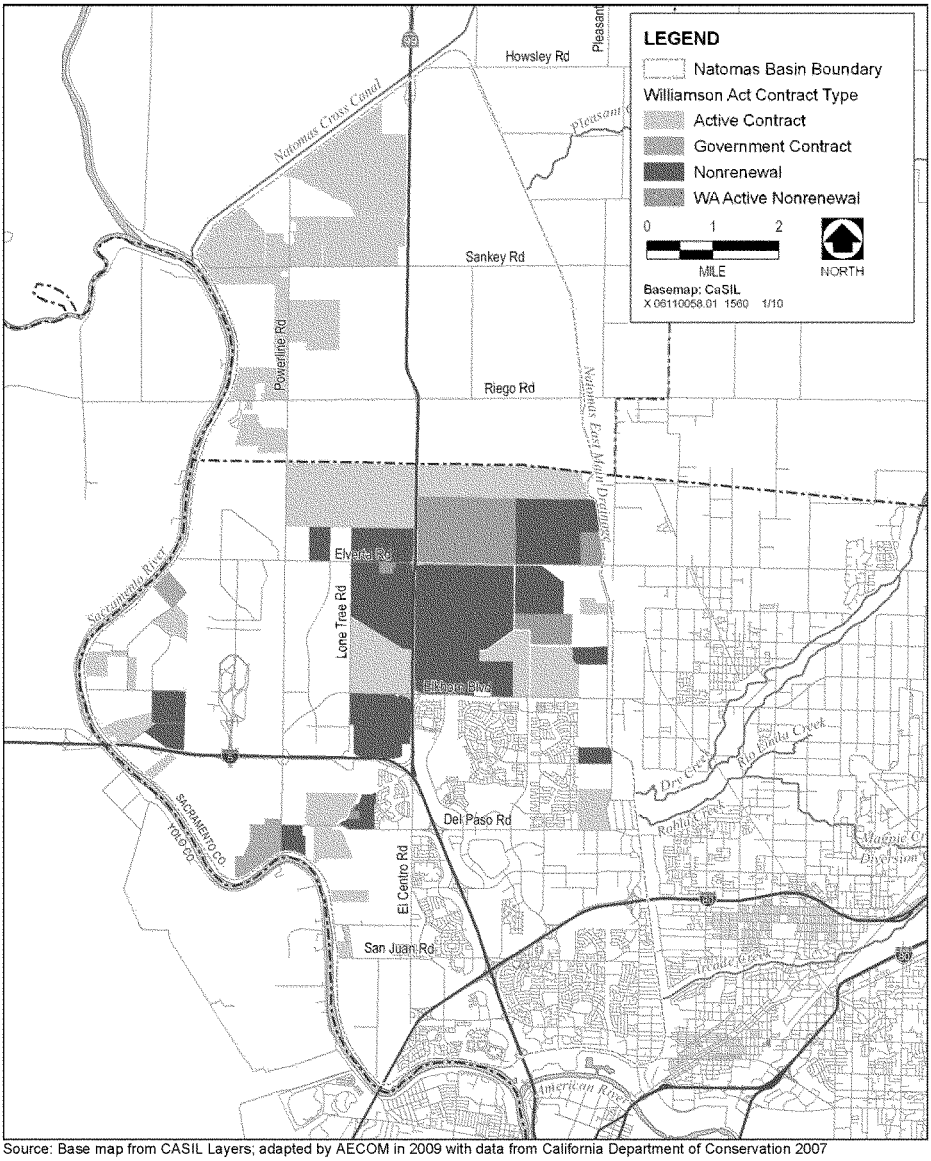
3.2.1.3 Regional and Local

SAFCA, acting as a joint powers authority pursuant to the Joint Exercise of Power Act (California Government Code Section 6500 et seq.) and the SAFCA Act (California Water Code App. Section 130-1 et seq.), is immune from compliance with local laws and regulations; however, SAFCA has substantially complied with adopted regional and local plans, policies, and ordinances applicable to the NLIP. This EIS/EIR provides relevant local plans and policies to describe the land use planning and policy context in which the NLIP, including the Phase 4b



Source: California Department of Conservation 2008

Important Farmland in the Project Area **Plate 3-1**



Source: Base map from CASIL Layers; adapted by AECOM in 2009 with data from California Department of Conservation 2007

Parcels Subject to Williamson Act Contracts **Plate 3-2**

Project, exists and how local agency plans and policies address resource issues in the NLIP area, including the Phase 4b Project, and because if USACE implements the Phase 4b Project, USACE would be bound by all regional and local laws, regulations, and ordinances.

3.2.1.4 SUTTER COUNTY GENERAL PLAN

The Land Use Element of the *Sutter County General Plan* (Sutter County 1996a) designates the proposed general distribution, location, and extent of all uses of land, including land for agriculture, and includes the following agricultural resource goal and policy that may be relevant to the project:

- **Goal 6.A:** To preserve high-quality agricultural land for agricultural purposes.
  - **Policy 6.B-3:** The County shall encourage the continued operation and expansion of existing agricultural industries.

Sacramento County General Plan

The *Sacramento County General Plan* is currently being updated (the DEIR was issued in spring 2009), but is not yet adopted. The Agricultural and Conservation Elements of the current *Sacramento County General Plan* (Sacramento County 1993) contain the following goals, objectives, and policies that may be relevant to this project:

Agricultural Element

- **Goal:** Protect important farmlands from conversion and encroachment and conserve agricultural resources.
- **Objective:** Prime farmlands (as defined by the California Department of Conservation) and lands with intensive agricultural investments (such as orchards, vineyards, dairies, and other concentrated livestock or poultry operations) protected from urban encroachment.
  - **Policy AG-5:** Mitigate loss of prime farmlands or lands with intensive agricultural investments through CEQA requirements to provide in-kind protection of nearby farmland.
- **Objective:** Retain agricultural land holdings in units large enough to guarantee future and continued agricultural use.
  - **Policy AG-7:** Agricultural zoning district boundaries shall be rational and shall respect parcel boundaries.
  - **Policy AG-8:** Agricultural land divisions shall not adversely affect the integrity of agricultural pursuits. Agricultural land divisions may be denied if the reviewing authority finds that the division of land is likely to create circumstances inconsistent with this policy.

Conservation Element

- **Goal:** Preserve and protect long-term health and resource value of agricultural soils.
- **Objective:** Loss of important agricultural soils compensated for by long-term protection of land with similar productivity value.
  - **Policy CO-54:** Direct development away from prime or statewide importance soils or otherwise provide for mitigation that slows the loss of additional farmland conversion to other uses.

- **Policy CO-55:** Projects resulting in the conversion of more than 50 acres of prime or statewide in importance farmland shall be deemed to have a significant environmental effect, as defined by CEQA.

City of Sacramento General Plan

The *City of Sacramento 2030 General Plan* was adopted on March 3, 2009 (City of Sacramento 2009). The City has a program with USACE and SAFCA in which it works with these and other responsible agencies to resolve floodplain restrictions. The following policies from the Agricultural Element of the *City of Sacramento 2030 General Plan* may be relevant to this project.

- **Goal ER 4.2: Growth and Agriculture.** Support preservation and protection of agricultural lands and operations outside of the city for their value for open space, habitat, flood protection, aesthetics, and food security by working with surrounding jurisdictions.

  - **Policy ER 4.2.2: Permanent Preservation.** The City shall work with the County, Natomas Basin Conservancy, and other entities to protect and permanently preserve a 1-mile buffer outside of the current city limits as of adoption of the General Plan to preserve viable agricultural activities and as a community separator between Sutter and Sacramento Counties and along the Sacramento River.

  - **Policy ER 4.2.3: Coordinate to Protect Farmland.** The City shall continue to work with County and other adjacent jurisdictions to implement existing conservation plans to preserve prime farmland and critical habitat outside the city.

3.2.2 ENVIRONMENTAL SETTING

Approximately 60% of the Natomas Basin is in some form of developed agricultural or open space use in unincorporated areas of Sacramento and Sutter Counties. Rice is the most common crop and is generally grown over large areas of contiguous land north of Elkhorn Boulevard, although the amount of land in active rice production has greatly diminished in recent years and many former rice fields are now fallow or support grain crops, such as wheat. Agricultural lands in the southern and western portions support other crops (field crops and orchards) (City of Sacramento, Sutter County, and TNBC 2003). **Table 3.7-1** summarizes information compiled for the most recent categorization of land cover types in the Natomas Basin conducted for TNBC.

According to the Sutter County Agricultural Commissioner, the gross value of agricultural production in Sutter County was $498,195,000 in 2008 (Sutter County Agricultural Commissioner 2009). Of the crops grown in the Natomas Basin, rice and alfalfa were among the ten leading farm commodities produced in Sutter County (Sutter County Agricultural Commissioner 2009). According to the Sacramento County Agricultural Commissioner, the gross value of agricultural production in Sacramento County was $357,803,000 in 2008 (Sacramento County Agricultural Commissioner 2009). Of the crops grown in the Natomas Basin, alfalfa hay and corn (silage and field) were among the ten leading farm commodities produced in Sacramento County (Sacramento County Agricultural Commissioner 2009).

The Local Funding EIR, which was certified by SAFCA in February 2007, anticipates that as part of SAFCA's comprehensive strategy for reducing the risk of flooding along the Sacramento River, SAFCA could acquire agricultural preservation easements from willing sellers in Sutter and Yolo Counties. In October 2007, the Governor signed into law Assembly Bill 930 amending the Sacramento Area Flood Control Agency Act of 1990 to make explicit SAFCA's authority to acquire agricultural preservation easements from willing sellers outside its jurisdiction, provided such acquisition is consistent with applicable county plans and the State Plan of Flood Control.

Pursuant to this authority, SAFCA recently cooperated with Yolo County, the California Department of Water Resources (DWR), the Yolo Land Trust, and the Sacramento Valley Conservancy in acquiring and recording

agricultural conservation easements on approximately 1,660 acres of agricultural land in the Elkhorn Basin of Yolo County. The Elkhorn Basin is an agricultural area located directly across the Sacramento River from the Natomas Basin and is classified as Prime Farmland by the FMMP. It is protected from flooding by the Sacramento River west levee and the Yolo Bypass east levee. Preservation of this farmland is consistent with the *Yolo County General Plan* and zoning for this area, and with recently enacted state legislation (Senate Bill 5) recognizing that "the level of flood protection afforded rural and agricultural lands by the original flood damage reduction system would not be adequate to protect those lands if they are developed for urban uses, and that a dichotomous system of flood protection for urban and rural lands has developed through many years of practice." SAFCA will assist in upgrading and maintaining levees at a standard suitable for agriculture.

3.2.2.1 CALIFORNIA IMPORTANT FARMLAND SYSTEM AND FARMLAND MAPPING AND MONITORING PROGRAM

Plate 3-1 shows the designated farmland within the Natomas Basin and the area northeast of the Basin according to the latest data available from the FMMP (Farmland Mapping and Monitoring Program 2006). As shown in **Plate 3-1**, much of the farmland in the Natomas Basin, including the farmland in areas where project features would be located, is designated by the FMMP as Prime Farmland and Farmland of Statewide Importance (California Department of Conservation 2008). The mapping indicates that Important Farmland in the Natomas Basin totaled approximately 40,000 acres in 2006. This represents approximately 6% of the total of approximately 715,000 acres of Important Farmland mapped by the FMMP in Sutter and Sacramento Counties in 2006 (California Department of Conservation 2008).

The Land Evaluation and Site Assessment (LESA) system is a tool used to rank lands for suitability and inclusion in the Federal Farmland Protection Program (FPP) administered by the Natural Resources Conservation Service (NRCS). LESA evaluates several factors, including soil potential for agriculture, location, market access, and adjacent land use. In general, because of the soil qualities, availability of irrigation water, and proximity of markets for agricultural products, agricultural lands in the Phase 4a Project area that are designated by the State of California as Important Farmlands would also receive a high ranking in the LESA system.

3.2.2.2 WILLIAMSON ACT CONTRACTS

The California Land Conservation Act of 1965, commonly known as the Williamson Act (California Government Code Section 51200 et seq.), is described above. Within the Natomas Basin, a total of approximately 7,586 acres are under Williamson Act Contract with an additional 1,534 acres filed for nonrenewal (see **Plate 3-2**).

3.3 LAND USE, SOCIOECONOMICS, AND POPULATION AND HOUSING

3.3.1 REGULATORY SETTING

3.3.1.1 FEDERAL

The following Federal laws related to socioeconomics and population and housing are relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Executive Order 11988, Floodplain Management, and
- Uniform Relocation Assistance and Real Property Acquisition Policies Act.

3.3.1.2 STATE

Title 23 of the California Code of Regulations (Waters)

Section 133 of Title 23 of the California Code of Regulations (CCR) provides standards for control of residential encroachments on the waterside of the Sacramento River east levee. These standards apply to the construction, reconstruction, or repair of dwellings and associated improvements on the left bank waterward berm and waterward levee slope of the Sacramento River within RD 1000. The standards require the owner or permittee to maintain the waterward slope of the levee and the utilized area within the floodway of the Sacramento River in the manner required by RD 1000 or any other agency responsible for maintenance. The standards specify where fill may be placed; and where improvements such as driveways, fences, walls and dwellings may be constructed on the waterward side of the levee. Areas less than one foot above the design floodplain must be maintained so that unobstructed visual inspection of the levee slope and toe is possible from the levee crown.

Relocation Assistance and Property Acquisition

The State of California's Government Code Section 7260, et seq. brings the California Relocation Act into conformity with the Federal Uniform Act. In the acquisition of real property by a public agency, both the Federal and state acts seek to (1) ensure consistent and fair treatment of owners of real property, (2) encourage and expedite acquisition by agreement to avoid litigation and relieve congestion in the courts, and (3) promote confidence in public land acquisition.

The Relocation Assistance and Real Property Acquisition Guidelines (Guidelines) were established by 25 CCR 1.6. The Guidelines were developed to assist public entities with developing regulations and procedures implementing Title 42, Chapter 61 of the United States Code – the Uniform Act, for Federal and Federally assisted programs. The Guidelines are designed to ensure that uniform, fair, and equitable treatment is given to people displaced from their homes, businesses, or farms as a result of the actions of a public entity. Under the Act, persons required to relocate temporarily are not considered "displaced," but must be treated fairly. Such persons have a right to temporary housing that is decent, safe, and sanitary and must be reimbursed for all reasonable out-of-pocket expenses. In accordance with these Guidelines, people shall not suffer disproportionate injury as a result of action taken for the benefit of the public as a whole. Additionally, public entities must ensure consistent and fair treatment of owners of such property, and encourage and expedite acquisitions by agreement with owners of displaced property to avoid litigation.

Phase 4b Project implementation would include both permanent and temporary displacement of people because it would require acquisition of property to construct flood damage reduction facilities and could potentially result in temporary relocation of affected residents during portions of project construction. Property acquisition and relocation services and compensation for living expenses for temporarily relocated residents as a result of project implementation would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act and California Government Code Section 7267 et seq.

3.3.1.3 REGIONAL AND LOCAL

As noted above in Section 3.2.1.3, SAFCA, acting as a joint powers authority pursuant to the Joint Exercise of Power Act (California Government Code Section 6500 et seq.) and the SAFCA Act (California Water Code App. Section 130-1 et seq.), is immune from compliance with local laws and regulations; however, SAFCA has substantially complied with adopted regional and local plans, policies, and ordinances applicable to the NLIP. This EIS/EIR provides relevant local plans and policies in order to describe the land use planning and policy context in which the project exists and how local agency plans and policies address resource issues in the NLIP, including the Phase 4b Project, area and because if USACE implements the Phase 4b Project, USACE would be bound by all regional and local laws, regulations, and ordinances.

Sacramento International Airport Master Plan

The Sacramento International Airport Master Plan (Sacramento County Airport System 2007a) was adopted by the Sacramento County Board of Supervisors in August 2007, upon certification of the FEIR for the Sacramento International Airport Master Plan. This plan represents the first full-scale master planning effort for the Airport since the mid-1970s. The master plan includes an evaluation of current conditions; definition of objectives, obstacles, and alternatives; an extensive public involvement program; and an implementation plan. The master plan is intended to guide airport development for at least the next 20 years. Phase 1 of the Master Plan (2007–2013) has been permitted and is under construction. Among the Phase 1 improvements are the following (Sacramento County 2007: 3-8 through 3-26):

- replacement of the existing Terminal B;
- construction of a new concourse from the replacement Terminal B, with a capacity of 23 contiguous gates;
- hotel/parking garage;
- new parallel Taxiway Y;
- new full-length parallel Taxiway A, hold pads, and high-speed taxiway exits for Runway 16R/34L (west runway);
- new airport traffic control tower north and west of Cy Homer Road and airport, airfield, and equipment maintenance buildings;
- general aviation area including corporate hangars, fixed base operator facility, and apron;
- expanded surface rental car parking lot between Airport Boulevard and Earhart Drive;
- expanded rental car terminal facility east of Airport Boulevard and McNair Circle;
- extension of Elkhorn Boulevard from Metro Air Park to Airport Boulevard;
- surface employee parking lot north of I-5 and west of Airport Boulevard to accommodate 1,500 automobile parking spaces;
- new remote economy parking and rental car overflow facility south of I-5 to accommodate 13,800 automobile parking spaces;
- extension of Airport Boulevard to the new parking facility;
- new ground-service equipment maintenance building east of Aviation Drive;
- new community fire station at the northwest corner of Lindbergh Drive and Crossfield Drive; and
- acquisition of two areas (48 acres and 313 acres) north of I-5 for buffers.

Components of future phases of the master plan are listed below (Sacramento County 2007: 3-8 through 3-26):

- extension of the east runway from the current 8,600 feet to 11,000 feet to accommodate nonstop transcontinental flights;
- construction of a new, 8,600-foot-long north-south runway 1,200 feet to the west of the current west runway;

- further expansion of Terminal B and a new Terminal B parking garage;
- extension of Terminal A concourse;
- 2,400-foot extension of Runway 16L/34R (east runway) to provide a total runway length of 11,000 feet;
- addition of a localizer, instrument landing system glide slope, and high-intensity approach lighting system with sequenced flashing lights for new instrument landing system approach to Runway 16L/34R perpendicular taxiway exits for parallel Taxiway A;
- construction of additional taxiways;
- improvement of off-airport roadway access to the airport, including extension of Elkhorn Boulevard to the airport, where it would connect to the airport road system; and
- extension by the Sacramento Regional Transit District of the proposed Downtown-Natomas-Airport light rail line to the airport, with a light rail stop at one of the Airport terminals.

Sacramento International Airport Comprehensive Airport Land Use Plan

The 2002 *California Airport Land Use Planning Handbook* (California Department of Transportation [Caltrans] 2002) is the guiding document for establishing, preparing, and modifying local airport land use compatibility plans (ALUCPs) (formerly known as comprehensive airport land use plans [CLUPs]) and their policies and procedures. ALUCP policies are intended to increase the awareness of residents, in any future residential communities that are approved, of their possible exposure to aircraft operations; to limit the potential for conflict between the airport and adjacent communities; and to protect future airport development and aircraft operations. The Sacramento Area Council of Governments (SACOG) serves as the Airport Land Use Commission (ALUC) for Sacramento, Sutter, Yolo, and Yuba Counties. It is responsible for developing and maintaining ALUCPs to protect public health and safety and ensure compatible land uses in the areas around each airport.

The Sacramento International Airport (formerly the Sacramento Metropolitan Airport) CLUP (ALUCP 1994) was adopted by the Sacramento County Board of Supervisors in October 1984 and amended in January 1994. The CLUP establishes planning boundaries for the Airport and defines compatible types and patterns of future land use. The purpose of the CLUP is to provide the Sacramento International Airport land area with compatibility guidelines for height, noise, and safety. The current Sacramento International Airport CLUP is more than 11 years old; since publication of the CLUP, the level of regional growth and expansion of airport operations have indicated the need for an update to the plan. (ALUCP 1994.)

The Sacramento County Board of Supervisors approved Resolution 2006-0490 for the Airport, which defined Airport Policy Planning Areas (APPAs) to be included into the County's General Plan. However, the current County's General Plan does not include this.

The Sacramento International Airport CLUP describes safety compatibility standards for public use airports, which include the Clear Zone, which is near the runway and is the most restrictive; the Approach/Departure Zone, which is located under the takeoff and landing slopes and is less restrictive; and the Overflight Zone, which is the area overflown by aircraft during the normal traffic pattern and is the least restrictive (**Plate 1-7**). New land uses proposed in any of these zones must comply with the standards identified by the CLUP.

In addition, the CLUP prohibits new residential development and school uses in those areas subject to noise levels of 65 decibels (dB) community noise equivalent level (CNEL) or above. Development in areas between the 60 and 65 CNEL are subject to an aircraft noise evaluation and implementation of recommend noise reduction measures.

Sacramento International Airport Wildlife Hazards Management Plan

The *Wildlife Hazards Management Plan* emphasizes the identification and abatement of wildlife hazards and outlines steps for monitoring, documenting, and reporting potential wildlife hazards and birds strikes. Agricultural crops and open water are the primary wildlife attractants within the Airport Perimeter B. Rice, wheat, safflower, corn, and alfalfa are all grown in the non-Airport portion of the Airport Perimeter B (SCAS 2007b).

Natomas Basin Habitat Conservation Plan

The 2003 *Natomas Basin Habitat Conservation Plan* (NBHCP) was prepared and adopted by the City of Sacramento, Sutter County, and TNBC (City of Sacramento, Sutter County, and TNBC 2003). An HCP is a planning document required under Section 10 of the Federal Endangered Species Act and was developed in consultation and coordination with the U.S. Fish and Wildlife Service (USFWS) to promote biological conservation in conjunction with economic and urban development in the Natomas Basin. The NBHCP establishes a multispecies conservation program to minimize and mitigate the expeeted loss of habitat values and incidental take of "covered species" that could result from urban development and operation and maintenance of irrigation and drainage systems. The NBHCP authorizes incidental take associated with 17,500 acres of urban development in southern Sutter County and within the City and County of Sacramento (i.e., 8,050 acres for the City of Sacramento, 7,467 aeres for Sutter County, and 1,983 acres of Metro Air Park in Sacramento County).

The potential for the Phase 4b Project to conflict with this adopted plan is addressed in this EIS/EIR (see Impact 4.7-I, "Impacts on Successful Implementation of Habitat Conservation Plans").

American River Parkway Plan

The American River Parkway (Parkway) is an open space greenbelt that extends approximately 29 miles from Folsom Dam to the American River's confluence with the Sacramento River. Within this area, the Parkway is defined to include the American River and adjacent floodplain. The American River Parkway Plan (Parkway Plan) provides a guide to land use decisions affecting the American River Parkway; specifically addressing its preservation, use, development, and administration. The purpose of the Parkway Plan is to ensure preservation of the naturalistic environment while providing limited development to facilitate human enjoyment of the Parkway, and to act as the management plan for the Federal and state Wild and Scenic Rivers Acts. The Parkway Plan is adopted as an element of the Sacramento County General Plan, and is referenced in the General Plans of the cities of Sacramento and Rancho Cordova.

Sacramento County has the principal responsibility for the administration and management of the portion of the Parkway from the confluence of the American River with the Sacramento River upstream to Hazel Avenue. The Parkway has several distinct areas, each having unique features and for which Area Plans are adopted. Reach I:1 of the American River north levee, within the Phase 4b Project area, is located in the Discovery Park Area.

Parkway land use designations regulate the types of land uses, location, and level of facility development or degree of natural resource protection within the Parkway. The land use designations for the portion of the Parkway located adjacent to the American River north levee, west of the I-5 Bridge is designated "Protected Area" and "Nature Study" on the Discovery Park Area Plan. These land use designations are described as follows:

- **Protected Area:** contains tracts of naturally occurring vegetation and wildlife, which although capable of sustaining light to moderate use with minimal alterations to the natural landscape, would be easily disturbed by heavy use. General access is encouraged, but facilities and other improvements are limited to convenience-type facilities. Activities that are compatible with these areas include nature appreciation, trails recreation, and aquatic recreation, (other than motorized boating and motorized boat access) for individuals and small groups.

- **Nature Study:** These areas include the most environmentally sensitive areas of the Parkway, including those with special characteristics of flora, fauna, topography, available surface water, or other characteristics that

are appropriate for the interpretive education and other limited passive recreational activities. The predominant user group is the individual or small groups under supervision.

Relevant Land Use Policies

Specific direction is provided in the policies of the Parkway Plan to encourage a positive relationship with adjacent land uses while still protecting the Parkway from visual impacts outside the Parkway (Sacramento County 2008:7-109). The Parkway Plan's land use policies regulate uses within the Parkway including the location and type of activities, as well as facilities and structures associated with those uses. For uses adjacent to the Parkway, the Parkway Plan provides policy guidance for jurisdictions regulating uses outside of the Parkway. The purpose of this policy guidance is to ensure that adjacent uses are sensitive to the Parkway's naturalistic setting and scenic values, protect the Parkway from negative visual impacts, and encourage a positive relationship with adjacent communities (Sacramento County 2008:7-111). Relevant policies include:

- **Policy 7.1:** Facilities and improvements shall not be installed within the Parkway unless consistent with an adopted Parkway area plan.
- **Policy 7.3:** Brush clearing, mowing of natural vegetation, fire breaks, or similar activities shall be permitted where necessary to protect the public's health, safety, or for the purposes of habitat restoration.
- **Policy 7.6:** Development in Nature Study Areas shall be strictly limited.
- **Policy 7.17:** Habitat restoration, local drainage, public utilities, and public flood control facilities, as determined to be appropriate to, and permitted within, a Wild and Scenic Rivers corridor, are permitted in all land use categories.
- **Policy 7.23:** Levees, landscaping, or other man-made or natural buffers should be used to separate, buffer or screen the Parkway visually form adjoining land uses, unless the adjacent land uses are indistinguishable from the Parkway.

Relevant Flood Control and Levee Protection Policies

- **Policy 4.9:** Flood management agencies should continue to maintain, and improve when required, the reliability of the existing public flood-control system along the lower American River to meet the need to provide a high level of flood protection to the heavily urbanized floodplain along the lower American River consistent with other major urban areas. This effort is expected to include raising and strengthening the levees as necessary to safely contain very high flow in the river (up to 160,000 cubic feet per second) for a sustained period.
- **Policy 4.10:** Flood control projects, including levee protection projects and vegetation removal for flood control purposes, shall be designed to avoid or minimize adverse impacts on the Parkway, including impacts to wildlife and wildlife corridors. To the extent that adverse impacts are unavoidable, appropriate feasible compensatory mitigation shall be part of the project. Such mitigation should be close to the site of the adverse impact, unless such mitigation creates other undesirable impacts.
- **Policy 4.12:** Vegetation in the Parkway should be appropriately managed to maintain the structural integrity and conveyance capacity of the flood control system, consistent with the need to provide a high level of flood protection to the heavily urbanized floodplain along the lower American River and in a manner that preserves the environmental, aesthetic, and recreational quality of the Parkway.

Sutter County General Plan

The Land Use Element of the *Sutter County General Plan* (Sutter County 1996a) designates the proposed general distribution, location, and extent of all uses of land, including land for agriculture, and includes the following agricultural resource goal and policy that may be relevant to the project.

- **Goal 6.A:** To preserve high-quality agricultural land for agricultural purposes.
    - **Policy 6.B-3:** The County shall encourage the continued operation and expansion of existing agricultural industries.

Chapter 1500–1410 of the Sutter County zoning code states that the General Agriculture District (AG District) is established to provide areas for general farming, low-density uses, open spaces, and by use permit, limited retail service uses that the planning commission believes will support the local agricultural industry. The AG District classification may be applied to rural communities where the predominant land use is of a general agricultural nature, but the needs of the agricultural community may require the location of retail, commercial, and service establishments. This district is consistent with the Agriculture–20 Acre Minimum Parcel Size (AG-20) or Agriculture–80 Acre Minimum Parcel Size (AG-80) and Agriculture–Rural Community (AG-RC) general plan land use designations.

Sacramento County General Plan

The *Sacramento County General Plan* is currently being updated (the DEIR was issued in spring 2009), but is not yet adopted. The Agricultural Element of the current *Sacramento County General Plan* (Sacramento County 1993) describes the goals of this element as the challenge of "maintenance of the County's agricultural lands, [and] their agricultural productivity...." The following objective and policies of the current general plan may be relevant to this project.

- **Objective:** Retain agricultural land holdings in units large enough to guarantee future and continued agricultural use.
    - **Policy AG-7:** Agricultural zoning district boundaries shall be rational and shall respect parcel boundaries.
    - **Policy AG-8:** Agricultural land divisions shall not adversely affect the integrity of agricultural pursuits. Agricultural land divisions may be denied if the reviewing authority finds that the division of land is likely to create circumstances inconsistent with this policy.

The Scenic Highways Element of the *Sacramento County General Plan* includes the objective to "take necessary steps to preserve and enhance the scenic qualities of the Garden Highway," and Garden Highway is designated a scenic corridor by the County. Policies included in the Scenic Highways Element encourage maintenance of natural roadside vegetation. (Sacramento County 1974.)

City of Sacramento General Plan

The *City of Sacramento 2030 General Plan* was adopted on March 3, 2009 (City of Sacramento 2009a). The City has a program with USACE and SAFCA in which it works with these and other responsible agencies to resolve floodplain restrictions. The following policies from the *City of Sacramento 2030 General Plan* may be relevant to this project.

Land Use and Urban Design

- **Goal LU 2.2:** City of Rivers. Preserve and enhance Sacramento's riverfronts as signature features and destinations within the city and maximize riverfront access from adjoining neighborhoods to facilitate public enjoyment of this unique open space resource.

    - **Policy LU 2.2.2:** Waterway Conservation. The City shall encourage the conservation and restoration of rivers and creeks within the urbanized area as multi-functional open space corridors that complement adjoining development and connect the city's parks and recreation system to the Sacramento and American Rivers.

Education, Recreation, and Culture:

- **Goal ERC 2.4:** Rivers, Creeks, and Natural Resource Areas. Provide positive recreational experiences and enjoyment of nature through the development, maintenance, patrol, and preservation of the rivers, creeks, and natural resource areas, while maximizing the use of these areas through partnerships with other agencies.

    - **Policy ERC 2.4.3:** Connections to Other Trails. The City shall maintain existing and pursue new connections to local, regional, and state trails.

Environmental Resources

- **Goal ER 2.1: Natural and Open Space Protection.** Protect and enhance open space, natural areas, and significant wildlife and vegetation in the city as integral parts of a sustainable environment within a larger regional ecosystem.

    - **Policy ER 2.1.4:** Retain Habitat Areas. The City shall retain plant and wildlife habitat areas where there are known sensitive resources (e.g., sensitive habitats, special-status, threatened, endangered, candidate species, and species of concern). Particular attention shall be focused on retaining habitat areas that are contiguous with other existing natural areas and/or wildlife movement corridors.

- **Goal ER 7.1: Visual Resource Preservation.** Maintain and protect significant visual resources and aesthetics that define Sacramento.

3.3.2 ENVIRONMENTAL SETTING

3.3.2.1 LAND USE PATTERNS

Cultivated lands and scattered rural residences are present in the northern portion of the Natomas Basin; however, the Airport, operated by the Sacramento County Airport System (SCAS), is a major feature in the Natomas Basin in northern Sacramento County. The rural land use pattern transitions from agriculture to urbanization where Sacramento County gives way to the City of Sacramento. The portion of the Natomas Basin that is within the City of Sacramento includes the North Natomas Community Plan area and the South Natomas planning area. The South Natomas planning area consists of more than 5,000 acres bounded by the American River on the South, the Sacramento River and I-80 on the west, I-80 on the north, and the NEMDC/Steelhead Creek on the east. Of the total, 590 acres are vacant. Close to 2,200 acres are designated for residential uses; 200 acres of the residential-designated lands are vacant (City of Sacramento Planning Department 2006). The North Natomas Community Plan area extends generally between I-80 on the south and Elverta Road on the north, and between the West Drainage Canal, Fisherman's Lake, and SR 99 on the west and the NEMDC/Steelhead Creek on the east. The plan area includes more than 9,000 acres, most of which are in the City of the Sacramento and 1,600 acres of which are in Sacramento County. Approximately 3,500 acres are designated for residential use, the primary use in

the plan area. The Employment Center designation has the most remaining vacant land with 890 acres of available land (City of Sacramento Planning Department 2007).

The Phase 4b Project area includes portions of the community of South Natomas within the incorporated boundaries of the city of Sacramento as well as rural portions of Sacramento County and southern Sutter County. Within the city of Sacramento, along the Sacramento River east levee, the American River north levee, and the NEMDC South, land uses are primarily residential, office, and retail commercial. Residences and businesses are located on the waterside and landside of the Sacramento River east levee and on the landside of the American River north levee. The American River Parkway is located in the floodplain south of the American River north levee. Land uses along the NEMDC North, west levee, and the NCC south levee consist of cultivated lands and scattered rural residences.

Land uses adjacent to the existing alignment of the West Drainage Canal and to the proposed West Drainage Canal relocation are agricultural except for the intersection of the canal alignment and Powerline Road, where there is a residence located on the south side of the canal.

The new sources of soil borrow proposed for the Phase 4b Project include the South Fisherman's Lake Borrow Area, the West Lakeside School Site south of I-5 (see **Plate 2-17**), and the Triangle Properties Borrow Area, which is located on the east side of the PGCC between Sankey Road and just south of Catlett Road (see **Plate 2-13**). Land uses in the immediate vicinity of the South Fisherman's Lake Borrow Area are agricultural; however, a residential subdivision in the city of Sacramento is located approximately 600 feet to the east of the portion of the South Fisherman's Lake Borrow Area that is north of San Juan Road. Land uses in the vicinity of the West Lakeside School Site are agricultural except to the east, where the site abuts a residential subdivision in the city of Sacramento. The Triangle Properties Borrow Area is located in Sutter County and is primarily an agricultural area with lands in rice cultivation, field crops, and orchards. Approximately 14 farm complexes (farm houses with barns, associated sheds, and equipment storage) and a small cemetery are located within the Triangle Properties Borrow Area. The Union Pacific Railroad line extends along the east boundary of the Triangle Properties Borrow Area.

3.3.2.2 POPULATION

According to the 2000 U.S. Census Bureau, Sacramento County had a resident population of 1,223,499 persons. The population projection for Sacramento County is 1,725,710 persons by 2025, representing a gain of approximately 502,211 new residents by 2025 and an increase of slightly more than 41%. Sutter County had a resident population of 78,930 in 2000. By 2025, the population of Sutter County is projected to reach approximately 137,108 persons, an increase of approximately 74%. (SACOG 2005)

Within the Natomas Basin, the majority of the population resides within the city of Sacramento. The 2000 Census recorded a population of approximately 35,500 persons within the Natomas Basin with a population of 86 persons recorded for the Sutter County portion and the remainder within the Sacramento County portion of the Basin. Within the Triangle Properties Borrow Area, the 2000 Census recorded approximately 56 residents (U.S. Census Bureau 2000).

The 2000 Census data show that the percentage of population with minority status in the South Natomas portion of Sacramento County is generally higher than for Sacramento County as a whole (42.2%). The 2000 Census data for Sacramento County census tracts in the Phase 4b Project area show that the percentage of minority populations is highest in the areas nearest to the American River north levee and the west levee of the NEMDC South. Populations with minority status make up over 50% of the population in this area. For Sutter County, the minority population makes up approximately 40% of Sutter County's overall population. In the Sutter County census tracts located within the Phase 4b Project area, the minority population makes up approximately 23% of the population, which is lower than for the county as a whole (U.S. Census Bureau 2000).

The U.S. Department of Housing and Urban Development (HUD) low-income limit[2] for a family of four in the Sacramento area in 2000 was at $42,300 and in the Yuba City area of Sutter County was $29,600 (HUD 2000a). The U.S. Census data reported that the median family income for the city of Sacramento was $42,051, for Sacramento County was $50,717, and for Sutter County was $44,300 (U.S. Census Bureau 2000).

According to the 2000 Census data for the census tract adjacent to the NEMDC South, the median family income was $27,460. For the census tracts adjacent to the Sacramento River east levee, Reach A:16–18, the median family income was $59,750; in Reach A:19, the median family income was $79,614; and in Reach A:20, the median family income was $44,028. For the census tracts adjacent to the American River north levee, the median family income was $48,650 (U.S. Census Bureau 2000).

3.3.2.3 HOUSING

The majority of housing in the Natomas Basin is located within the city of Sacramento in the communities of North and South Natomas. In 2005, SACOG reported a total of 13,495 housing units in North Natomas, of which 70% were single family and 30% were multi-family. For the same time period, SACOG reported 15,757 housing units in South Natomas, of which 57% were single family and 43% were multi-family (City of Sacramento 2009b: 5-6). According to the 2000 Census, the average vacancy rate for census tracts in North Natomas was 12.2% and the average vacancy rate for the combined census tracts in South Natomas was 7.0%. Of the census tracts within South Natomas, those tracts adjacent to the Sacramento River east levee had vacancy rates as high as 18.9% (U.S. Census Bureau 2000). The average rental vacancy rate in North Natomas in 2007 was 7.0% and in South Natomas it was 5.2% (City of Sacramento 2009b: 5-6). A residential building moratorium in North and South Natomas went into effect in December 2008; however, because of the slow-down in the housing market, the inventory of houses for sale remains high in the Natomas area (Long 2008).

In Sutter County, the vacancy rate in the census tracts covering southern Sutter County including the northern portion of the Natomas Basin was 7.6% (U.S. Census Bureau 2000).

The 2000 Census data recorded the median home price in North Natomas for the census tract adjacent to the Sacramento River east levee as $154,100. For the two census tracts in Reach A:19–20, the median home price was $220,100 and $217,600, respectively. Along the American River north levee, the median home price was $131,900. For the census tract adjacent to the NEMDC South, the median home price was $79,800. The median home price for the census tract adjacent to the NEMDC North was $199,100 (U.S. Census Bureau 2000).

3.4 GEOLOGY, SOILS, AND MINERAL RESOURCES

3.4.1 REGULATORY SETTING

3.4.1.1 FEDERAL

The following Federal law related to geology, soils, and mineral resources is relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Federal Earthquake Hazards Reduction Act.

[2] HUD defines "low income" and "very low income" for its many housing assistance programs. Generally, low income is considered to be 80% of the median income for the Metropolitan Statistical Area (MSA) and adjusted for household size and the specific housing program (HUD 2003). The median family income in 2000 for the Sacramento MSA was $52,900 and for the Yuba City MSA was $36,000. The low-income level for the Yuba City MSA for fiscal year 2000 was based on the state median income; therefore, the low-income level is greater than 80% of the MSA median income (HUD 2000b).

3.4.1.1 STATE

California Building Standards Code

The State of California provides minimum standard for building design through the California Building Standards Code (CBC) (California Code of Regulations [CCR], Title 24). Where no other building codes apply, Chapter 29 of the CBC regulates excavation, foundations, and retaining walls. The CBC also applies to building design and construction in the state and is based on the Federal Uniform Building Code (UBC) used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with numerous, more detailed and/or more stringent regulations.

The state earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC. The CBC identifies seismic factors that must be considered in structural design.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils and liquefaction areas.

The NLIP, including the Phase 4b Project, would require reconstruction of pumping plants, excavation, and drainage and erosion control, which must conform to the CBC.

California Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (California Public Resources Code [PRC] Sections 2690–2699.6) addresses seismic hazards other than surface rupture, such as liquefaction and induced landslides. The Seismic Hazards Mapping Act specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites, and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils. The closest active fault to the Natomas Basin is located approximately 15 miles to the northwest, as shown in **Table 3.4-2**.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (California PRC Sections 2621–2630) was passed by the California Legislature in 1972 to mitigate the hazard of surface faulting to structures. The act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. Local agencies must regulate most development in fault zones established by the State Geologist. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults. As discussed below in Section 3.4.2.2, "Seismicity," the NLIP area, including the Phase 4b Project area, does not contain any Alquist-Priolo Earthquake Fault Zones.

California Surface Mining and Reclamation Act

The California Surface Mining and Reclamation Act of 1975 (SMARA) (California PRC Section 2710 et seq.) addresses surface mining operations. Surface mining operations include, "...borrow pitting, streambed skimming, segregation and stockpiling of mined materials (and recovery of the same) ..." (CCR, Title 14, Section 3501). Section 3501 further defines excavations for on-site construction as "earth material moving activities that are required to prepare a site for construction of structures, landscaping, or other land improvements (such as excavation, grading, compaction, and the creation of fills and embankments), or that in and of themselves constitute engineered works (such as dams, road cuts, fills, and catchment basins)." The SMARA statute requires

mitigation to reduce adverse impaets on public health, property, and the environment. Because borrow activities associated with the NLIP, including the Phase 4b Project, would disturb more than 1 acre or remove more than 1,000 cubic yards of material through surface mining activities, including the excavation of borrow pits for soil material, the project proponent(s) must comply with SMARA.

SMARA is implemented through ordinances adopted by local government "lead agencies" that provide the regulatory framework under which local mining and reclamation activities are conducted. The State Mining and Geology Board reviews the local ordinances to ensure that they meet the procedures established by SMARA. In general, SMARA permitting requires lead agency approval of a permit, a reclamation plan, and the posting of approved financial assurance for the reclamation of mined land.

Cities and counties have the authority to enforce SMARA and create additional regulations. Sacramento and Sutter Counties are the SMARA lead agencies for surface mining operations in their respective counties within the NLIP area. Compliance is achieved by either obtaining a SMARA permit or exemption.

Certain construction activities do not require a SMARA permit. As stated in California PRC Section 2714, the following activities are exempt:

b) On-site excavation and onsite earthmoving activities that are an integral and necessary part of a construction project and that are undertaken to prepare a site for construction of structures, landscaping, or other land improvements associated with those structures, including the related excavation, grading, compaction, or the creation of fills, road cuts, and embankments, whether or not surplus materials are exported from the site, subject to all of the following conditions:

    1. All required permits for the construction, landscaping, or related land improvements have been approved by a public agency in accordance with applicable provisions of state law and locally adopted plans and ordinances, including, but not limited to, Division 13 (commencing with Section 21000).

    2. The lead agency's approval of the construction project included consideration of the onsite excavation and onsite earthmoving activities pursuant to Division 13 (commencing with Section 21000).

    3. The approved construction project is consistent with the general plan or zoning of the site.

    4. Surplus materials shall not be exported from the site unless and until actual construction work has commenced and shall cease if it is determined that construction activities have terminated, have been indefinitely suspended, or are no longer being actively pursued.

Sacramento County has granted SMARA exemptions for the Airport north bufferlands (for Phase 2 Project construction), most of the Fisherman's Lake Borrow Area (including Novak, for Phase 4a Project construction), and the South Sutter, LLC borrow site (for Phase 3 and 4a Projects' construction); and Sutter County has granted a SMARA exemption for the Brookfield borrow site (for Phase 2 Project construction). Exemptions were granted under Section 20.01.040(B) of the Sacramento County Code and Section 290-030 of the Sutter County Code, for NLIP borrow sites in each respective county, which are consistent with Section 2714(b) of SMARA. Sacramento County determined that the northeastern corner of the Fisherman's Lake Borrow Area (called the Natomas Urban Development site) would require a SMARA permit and, as such, SAFCA will obtain a SMARA permit for this site (for Phase 4a Project construction).

Table 2-22 lists the borrow sites that would supply soil borrow for the NLIP and potentially for Phase 4b Project construction. SMARA permits or exemptions would be obtained, as appropriate, for selected Phase 4b Project

borrow sites. Excavation activities would not commence until all regulatory and compliance requirements for borrow activities have been met.

SMARA also requires identification and classification of mineral resource zones (MRZs). In Sacramento County, Portland cement concrete-grade alluvial sand and gravel and kaolin clay resources are considered to be economically important industrial mineral resources. **Table 3.4-1** provides descriptions for each MRZ classification within the NLIP area.

Table 3.4-1
California Geological Survey Mineral Land Classification System

Classification	Description
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood for their presence exists
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated from existing data
MRZ-4	Areas where available data are inadequate for placement in any other mineral resource zone

Note: MRZ = Mineral Resource Zone
Source: Dupras 1999

3.4.1.2 REGIONAL AND LOCAL

There are no local laws, regulations, policies, or ordinances related to geology, soils, and mineral resources that are relevant to the NLIP, including the Phase 4b Project.

3.4.2 ENVIRONMENTAL SETTING

The Natomas Basin is relatively flat and open. Levees provide the only significant topographic relief in the Basin and near the Phase 4b Project area.

3.4.1.3 GEOLOGY

The Natomas Basin, which includes the Phase 4b Project area, lies in the Sacramento Valley portion of the Great Valley Geomorphic Province. The Great Valley is a large valley trending northwest-southeast that is bounded by the Sierra Nevada to the east and south, the Coast Ranges to the west, and the Klamath Mountains to the north. The Great Valley is drained by the Sacramento and San Joaquin Rivers, which join and flow out of the Great Valley province through San Francisco Bay. This geomorphic province is an asymmetric trough approximately 400 miles long and 50 miles wide that is characterized by a relatively flat alluvial plain made up of a deep sequence of sediment deposits from Jurassic (180 million years ago) to recent age. The sediments in the Great Valley vary between 3 and 6 miles in thickness and were derived primarily from erosion of the Sierra Nevada to the east, with lesser material from the Coast Ranges to the west. The eastern edge of the Sacramento Valley is flanked by uplifted and tilted sedimentary strata that overlie rocks of the Foothills Metamorphic Belt and are in turn overlain on the west by younger alluvium.

The Sacramento Valley has been a depositional basin throughout most of the late Mesozoic and Cenozoic time. A vast accumulation of sediments was deposited during cyclic transgressions and regressions of a shallow sea that once inundated the valley. Overlying the thick sequence of sedimentary rock units that form the deeply buried bedrock units in the mid-basin areas of the valley are Late Pleistocene and Holocene (Recent) alluvial deposits, consisting of reworked fan and stream materials that were deposited by streams before the construction of the existing flood damage reduction systems. The youngest geomorphic features in the program study area are low

floodplains, which are found primarily along the Sacramento and American Rivers. The natural floodplains of these rivers are very wide in this area because the land is relatively flat. These major drainage ways were originally confined within broad natural levees sloping away from the rivers or streams. The natural levees formed through the deposition of alluvium during periods of flooding. As flood waters lost energy, the coarser materials settled out nearest the rivers and streams, forming the natural levees and sand bars in the vicinity of the river channel. The finer material was carried in suspension farther from the rivers or streams, and settled out in quiet water areas such as swales, abandoned meander channels, and lakes. However, because the streams have meandered and reworked the previously deposited sediments, extreme variations in material types may be found over a limited distance or depth.

Flanking the Recent alluvial deposits in the Natomas Basin are late Pleistocene alluvial fan and terrace deposits of the Modesto and Riverbank Formations (Helley and Harwood 1985). Stream terrace deposits, mapped as the Modesto Formation, are higher in elevation and older than floodplain sediments. Before the construction of the existing levees, these stream terraces were occasionally flooded, but only small amounts of sediment were deposited during flood events. The lower fan terraces of the Riverbank Formation are higher in elevation and older than stream terraces, and were only rarely flooded.

The major source of sediments deposited in the Natomas Basin is from the erosion of the Sierra Nevada mountain range and foothills to the east of the Sacramento Valley. Naturally occurring asbestos (NOA) is known to occur in the foothill metamorphic belt. Therefore, NOA may be present in the Basin; however, the likelihood of project area soils containing significant concentrations of NOA is low due to the long distance from the source rock (Anderson 2008).

3.4.1.4 SEISMICITY

The Natomas Basin has experienced relatively low seismic activity in the past and does not contain any Alquist-Priolo Earthquake Fault Zones (California Geological Survey 1999, Hart and Bryant 1999). Numerous earthquakes of magnitude (M) 5.0 or greater have occurred on regional faults, primarily those within the San Andreas Fault System. The west side of the Central Valley is a seismically active region. The nearest known active (Holocene or Historic) fault trace to the project area is the Dunnigan Hills fault, approximately 30 miles northwest of downtown Sacramento and 15 miles from the Natomas Basin (Jennings 1994).

The closest active faults to the project area are listed in **Table 3.4-2**. In addition, the approximate distance from the project area, maximum moment magnitude, and fault class are identified.

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is fault ground rupture, also called surface faulting. Because there are no active faults mapped in the NLIP area by the California Geological Survey or the U.S. Geological Survey, and the area is not located within an Alquist-Priolo Earthquake Fault Zone, fault ground rupture is unlikely in the Phase 4b Project area. Common secondary seismic hazards include ground shaking, liquefaction, subsidence, and seiches. These hazards are discussed briefly below:

- **Ground shaking**. Seismic ground shaking refers to ground motion that results from the release of stored energy during an earthquake. The intensity of ground shaking depends on the distance from the earthquake epicenter to the site, the magnitude of the earthquake, site soil conditions, and the characteristic of the source.

- **Ground failure/liquefaction**. Liquefaction is a process by which water-saturated materials (including soil, sediment, and certain types of volcanic deposits) lose strength and may fail during strong ground shaking, when granular materials are transformed from a solid state into a liquefied state as a result of increased pore-water pressure. Structures on ground that undergoes liquefaction may settle or suffer major structural damage. Liquefaction is most likely to occur in low-lying areas where the substrate consists of poorly consolidated to unconsolidated water-saturated sediments or similar deposits of artificial fill. Liquefaction during an

Table 3.4-2
Active Faults in the NLIP Area

Fault Name	Approximate Distance (Miles)[1]	Fault Class[2]	Maximum Moment Magnitude[3]
Dunnigan Hills	15	NA	NA
Great Valley 3	23	B	6.9
Great Valley 4	26	B	6.6
Great Valley 5	35	B	6.5
Hunting Creek-Berryessa	38	B	7.1
Concord-Green Valley	41	B	6.7
Great Valley 2	44	B	6.4
West Napa	48	B	6.5
Bartlett Springs	50	B	7.6
Great Valley 1	52	B	6.7
Collayomi	58	B	6.5
Mount Diablo Thrust	59	B	6.6
Maacama-Garberville	60	B	7.5
Greenville	61	B	6.9
Hayward–Rodgers Creek	62	A	7.2

Notes: NA = not available
[1] Approximate distance is measured from the Natomas Basin to the respective active fault line.
[2] Faults with an "A" classification are capable of producing large magnitude (M) events (M greater than 7.0), have a high rate of seismic activity (e.g., slip rates greater than 5 millimeters per year), and have well-constrained paleoseismic data (e.g., evidence of displacement within the last 700,000 years). Class B faults are those that lack paleoseismic data necessary to constrain the recurrence intervals of large-scale events. Faults with a "B" classification are capable of producing an event of M 6.5 or greater.
[3] The moment magnitude scale is used by seismologists to compare the energy released by earthquakes. Unlike other magnitude scales, it does not saturate at the upper end, meaning that there is no particular value beyond which all earthquakes have about the same magnitude, which makes it a particularly valuable tool for assessing large earthquakes.
Sources: Jennings 1994, Petersen et al. 1996, Kleinfelder 2008

earthquake requires strong shaking continuing for a long period and loose, clean granular materials (particularly sands) that may settle and compact because of the shaking. Evidence of liquefaction may be observed in "sand boils," which are expulsions of sand and water from below the surface due to increased pore-water pressure below the surface. Areas paralleling the Sacramento River that contain clean sand layers with low relative densities coinciding with a relatively high water table have generally high liquefaction potential.

- **Subsidence and settlement**. Subsidence is the gradual settling or sudden sinking of the ground surface resulting from subsurface movement of earth materials. Seismically induced settlement refers to the compaction of soils and alluvium caused by ground shaking. Fine-grained soils are subject to seismic settlement and differential settlement. Areas underlain by low-density silts and clays associated with fluvial depositional environments are susceptible to seismically induced settlement. These environments include old lakes, sloughs, swamps, and streambeds. The amount of settlement may range from a few inches to several feet. The potential for differential settlement is highest and occurs over the largest areas during great earthquakes. A potential for differential settlement exists where low-density and unconsolidated material is encountered, such as overbank river deposits (present day and historical) common along the Sacramento River. Subsidence and settlement may also occur from construction of the adjacent levee separate from

liquefaction or densification due to both immediate settlements in granular soils and the consolidation of fine grained soils.

- **Seismic seiches**. A seiche is an earthquake-induced wave within an enclosed or restricted body of water, such as a lake, reservoir, or channel. Seiches can cause a body of water to overtop and damage levees and dams and may lead to inundation of surrounding areas.

Wind-induced waves and subsidence, either with or without a seismic event, may result from installation of cutoff walls. Geotechnical engineering studies performed for the Landside Improvements Project are required to comply with standard engineering practices for levee design. The Central Valley Flood Protection Board's (CVFPB's) standards are the primary State standards applicable to the proposed levee improvements; these are stated in Title 23, Division 1, Article 8, Section 111–137 of the California Code of Regulations. CVFPB's standards direct that levee design and construction be in accordance with USACE's *Engineering Design and Construction of Levees* (USACE 2000), the primary Federal standards applicable to levee improvements. Because the design, construction, and maintenance of levee improvements must comply with the regulatory standards of USACE and CVFPB, it is assumed that the design and construction of all levee modifications under the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would meet or exceed applicable design standards for static and dynamic stability, seismic ground shaking, liquefaction, subsidence, and seepage, as well as wind-induced waves and subsidence.

3.4.1.5 SOILS

The Sutter and Sacramento County soil surveys (NRCS 1988, 1993) identify a variety of soil map units in the NLIP area. Most of the soils in the NLIP area, including the Phase 4b Project area, are shallow to moderately deep, sloping, well-drained soils with very slowly permeable subsoils underlain with hardpan. These soils have good natural drainage, slow subsoil permeability, and slow runoff (NRCS 1988, 1993).

The Natomas Basin generally consists of deep soils derived from alluvial sources, which range from low to high permeability rates and low to high shrink-swell potential. Soils range from low to high hazard ratings for construction of roads, buildings, and other structures related to soil bearing strength, shrink-swell potential, and the potential for cave-ins during excavation. Soils immediately adjacent to the Sacramento River are dominated by deep, nearly level, well-drained loamy and sandy soils. The natural drainage is good, and the soils have slow to moderate subsoil permeability. The river terraces consist of very deep, well-drained alluvial soils. (NRCS 1988, 1993.) The porous nature of the soils underneath the existing levee system is an important consideration for the design of levee improvements within the NLIP area, including the Phase 4b Project.

3.4.1.6 MINERALS

Sacramento County protects aggregate (i.e., sand and gravel) from land uses that could preclude or inhibit a timely mineral extraction to meet market demand (Sacramento County 1993). According to the California Department of Conservation (DOC), Division of Mines and Geology, a small area of the northern corner of the proposed West Lakeside borrow site is located in an area designated by DOC as MRZ-3, meaning it is an area containing mineral deposits, the significance of which cannot be evaluated from existing data; the remainder of the Phase 4b Project footprint is designated as MRZ-1, meaning that no significant mineral deposits are present in this area or where it is judged that little likelihood exists for their presence (Dupras 1999). Other than the West Lakeside borrow area located within the Phase 4b Project footprint, there are no other MRZ-designated areas within the Sacramento County portion of the NLIP area.

There are no MRZ-designated areas within the Sutter County portion of the NLIP area, including the Phase 4b Project area.

3.5 HYDROLOGY AND HYDRAULICS

3.5.1 REGULATORY SETTING

3.5.1.1 FEDERAL

The following Federal laws related to hydrology and hydraulics are relevant to the NLIP, including the Phase 4b Project, and are described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Executive Order 11988, Floodplain Management;
- Federal Emergency Management Agency Code of Federal Regulations Title 44, Section 65.10 (Levee Requirements) and FEMA Flood Zone Designations; and
- Rivers and Harbors Act of 1899, As Amended (Sections 14 and 10).

3.5.1.2 STATE

California Executive Order S-01-06, Identification and Repair of Critical Erosion Sites

On February 24, 2006, Governor Arnold Schwarzenegger declared a state of emergency for California's levee system. Soon after, he signed Executive Order S-01-06, directing DWR to identify and repair eroded levee sites on the Federal/State levee system to prevent catastrophic flooding and loss of life. To date, nearly 250 levee repair sites have been identified, and more than 100 of the most critical sites have been completed. Two of the sites are along the bank of the Sacramento River east levee between the NCC and the American River. Rock toe protection has been installed at these sites. These improvements do not overlap temporally with construction of the Phase 4b Project.

Central Valley Flood Control Act of 2008

The Central Valley Flood Control Act of 2008, passed in 2007, recognizes that the Central Valley of California, which includes the Natomas Basin, is experiencing unprecedented development, resulting in the conversion of historically agricultural lands and communities to densely populated residential and urban centers. Because of the potentially catastrophic consequences of flooding, the Act recognizes that the Federal government's current (100-year (0.01 AEP) design flood elevation standard is not sufficient to protect urban and urbanizing areas within flood-prone areas throughout the Central Valley and declares that the minimum standard for these areas is a 200-year (0.005 AEP) design flood elevation. To continue with urban development, cities and counties must develop and implement plans for achieving this new standard by 2025. With respect to flood risk damage reduction, the Central Valley Flood Control Act also calls upon DWR to develop a comprehensive Central Valley Flood Protection Plan by the end of 2012 for protecting the lands currently within the Sacramento–San Joaquin River Flood Management System.

Central Valley Flood Protection Board Encroachment Permit

The California Central Valley Flood Protection Board (CVFPB, formerly The Reclamation Board) requires an encroachment permit for any non-Federal activity along or near Federal flood damage reduction project levees and floodways or in CVFPB-designated floodways to ensure that proposed local actions or projects do not impair the integrity of existing flood damage reduction systems to withstand flood conditions. The permits are conditioned upon SAFCA receipt of permission from USACE for alteration of the Federal project works pursuant to Section 408. For the Phase 4b Project, CVFPB encroachment permits would only be needed if Congress does not provide authorization and SAFCA chooses to proceed with the Phase 4b Project without Federal participation.

3.5.1.3 REGIONAL AND LOCAL

Sutter County General Plan

There are no policies in the Sutter County General Plan related to hydrology and hydraulics that are relevant to the NLIP, including the Phase 4b Project.

Sacramento County General Plan

The *Sacramento County General Plan* is currently being updated (the DEIR was issued in spring 2009), but is not yet adopted. The Safety Element of the existing *Sacramento County General Plan* (Sacramento County 1993) contains the goal, "Minimize the loss of life, injury and property damage due to flood hazards." Policies in support of this goal generally require that the County work with USACE, SAFCA, and other Federal, state, and local government entities to provide for flood protection within the County and discourage development within the 100-year floodplain. Policy SA-6 requires the County to participate through SAFCA in obtaining Federal authorization for construction of flood control projects on the Sacramento and American Rivers to provide 200-year flood protection; Policy SA-10 requires the County to continue local efforts that encourage implementation of the Federal Flood Insurance Program; Policy SA-13 requires the County to prohibit urban uses on unprotected flood land; and Policy SA-14 requires the County to participate with the City of Sacramento and USACE and other Federal, state, regional, and local governments and agencies to develop policies to finance, construct, and plan flood improvements to eliminate flooding in Sacramento County.

City of Sacramento General Plan

There are no policies in the Sacramento County General Plan related to hydrology and hydraulics that are relevant to the NLIP, including the Phase 4b Project.

3.5.2 ENVIRONMENTAL SETTING

3.5.2.1 SURFACE WATER HYDROLOGY

The NLIP area, including the Phase 4b Project, lies just north of the confluence of the Sacramento and American Rivers. The Sacramento River drainage basin covers approximately 26,150 square miles and includes the Feather River drainage basin, which totals approximately 5,500 square miles. Despite its relatively small size, the Feather River has the potential to generate very high peak floods. **Table 3.5-1** compares the runoff characteristics of these drainage basins.

Table 3.5-1
Basin Runoff Characteristics

Basin	Watershed Area (square miles)	Flood of Record (year)	Unregulated Flow Record 1-Day Flow (cfs)	Flow per Square Mile (cfs)
Sacramento River at Latitude of Verona	21,251	1997	624,000	29
Feather River at Shanghai Bend	5,313	1997	534,000	101
Sacramento River at Latitude of Sacramento	26,150	1997	840,000	32

Note: cfs = cubic feet per second
Source: SAFCA 2007 (data provided by MBK Engineers)

Total annual precipitation within the Sacramento River watershed falls as both rain and snow. Precipitation in winter falls primarily as snow in the higher elevations. Annual, monthly, and daily precipitation varies widely within the watershed, with the highest precipitation totals generally falling in winter, in the Sierra Nevada, and in the northern part of the watershed. The high variability in precipitation, snowfall, and snowmelt results in highly variable runoff patterns each year and month during late fall, winter, and spring. The number of high-water events in the waterways surrounding the Natomas Basin each year varies widely as well, and ranges from no events to five or more events.

The American and Feather Rivers produce about 90% of the flood flows approaching Sacramento from the north and the east. Both historically and as part of the design of the Sacramento River Flood Control Project (SRFCP), flood flows approaching from the north are split between the Sacramento River and the Yolo Basin (Bypass). Under the current design of the SRFCP, the Yolo Bypass absorbs about 70% of this flow at the latitude of Verona and 80% at the latitude of Sacramento. To the east, the entire flow of the American River must be passed through the urban core of Sacramento. Improved flood protection for the Sacramento area is thus dependent on the strength of the levee system along the lower Sacramento and American Rivers and on the capability of Folsom Dam to limit American River flows to the design capacity of the American River levee system.

The SRFCP was designed based on the flows and water surface elevations produced by the great floods of 1907 and 1909. The project design considered that areas inundated by these floods would be protected by levees, thus increasing flood flows downstream due to the elimination of floodplain storage. Because the 1907 and 1909 floods were the largest to occur since 1862, it was assumed that floods of this magnitude would recur very infrequently throughout the watershed. In fact, based on the continuous record of streamflow data since the SRFCP was approved, it appears that the 1907 and 1909 floods are approximately equal to a 10-year flood (0.10 AEP) along the American and Feather Rivers. Consequently, the original plan of flood damage reduction has been modified numerous times to account for changes in the SRFCP design flood and the flood risk associated with the urban areas in the American and Feather River basins. The most recent modifications have involved the construction of Folsom Dam and the extension of the levee along the north side of the American River (completed 1955) and the construction of Oroville Dam and New Bullards Bar Dam in the Feather River basin (completed 1969).

3.5.2.2 LEVEE DESIGN

When the SRFCP was conceived, river navigation was an important element of the Sacramento Valley's transportation infrastructure. Hydraulic mining debris (sand, gravel, and cobbles) had clogged river channels and added significant uncertainty and cost to navigation. The SRFCP was designed in part to address this problem. Thus, the mainstem river levees were placed close to the channel to confine river flows in flood stage and use the energy of the river to drive hydraulic mining sediments out of the system. This design also reduced the cost of levee construction by taking advantage of the high ground built up by the river over time along its banks and by making it possible for existing technology (the clam shell dredge and hydraulic suction dredge) to efficiently use the sediment in the channel as a borrow source for the levees.

This design, although well suited to address the technical and financial challenges of a previous era, has left a succeeding generation of flood managers with two systemic problems and levee risk factors: chronic erosion and seepage. Because of the use of relatively porous hydraulic mining sediments in many parts of the mainstem levee system, the levees have a propensity to seep when subjected to prolonged high water surface elevations such as occurred during the floods of 1986 and 1997. Through-seepage was deemed a levee system design deficiency in the aftermath of the 1986 flood, and a substantial capital improvement program has been under way since the early 1990s to address this deficiency. Additionally, because the mainstem levees are constructed on high berms relatively close to the river channel, the same energy that was harnessed to drive hydraulic mining sediment from the system also exerts itself against the sandy alluvial soil layers that lie beneath the levees. In high river stage conditions, this energy is strong enough to push water through these layers in volumes great enough to exert an uplift force capable of fracturing the soil mantel on the landside of the levee. This "underseepage" can occur

where levees are constructed on low-permeability foundation soil (silt and clay) underlain by a higher-permeability layer (sand and gravel), and makes the levee susceptible to failure during periods of high river stage.

3.5.2.3 FREQUENCY OF FLOODING

The Natomas Basin is subject to flooding from a combination of flows in the Sacramento and American River channels and in the tributary streams east of the Basin. Along the northern and western perimeters of the Basin, the greatest threat is from a large flood in the Sacramento/Feather River basin combined with high runoff in the creeks and streams of southern Sutter and western Placer Counties that drain through the NCC. The probability (or frequency) of an uncontrolled flood in the Natomas Basin is linked to the hydrology of the lower Sacramento Valley and the performanec of the levees comprising the SRFCP, including the levees upstream of the Natomas Basin. The hydrology of the lower Sacramento Valley was extensively analyzed by USACE and the State of California Reclamation Board (now the Central Valley Flood Protection Board) as part of the Sacramento and San Joaquin River Basins California Comprehensive Study. These data have been used to create hydraulic models that route the estimated runoff for various flood events through the river and stream channels comprising the SRFCP and estimate the resulting water surface elevations. In very large floods that exceed the design capacity of the SRFCP, these calculated water surface elevations are highly sensitive to assumptions about the performance of upstream SRFCP levees. If the SRFCP levees upstream of the Natomas Basin are assumed to fail when overtopped, these very large floods produce much lower water surface elevation in the channels around the Natomas Basin (by 1 to 2 feet) than if it is assumed the upstream levees will not fail when overtopped.

3.5.2.4 IRRIGATION AND DRAINAGE FACILITIES

Reclamation of the Natomas Basin for agricultural development required construction of two major ditch and canal systems in the Natomas Basin: an irrigation system owned and operated by NCMWC and a drainage system owned and operated by RD 1000. NCMWC pumps water into the Basin to provide irrigation water to its shareholders for agricultural use within the Basin. During winter (October through April), drainage is primarily rainfall runoff; during summer (May through September), drainage water from agricultural fields is typically recirculated for irrigation. Because the Basin is surrounded by levees, all excess drainage within the Basin must be pumped out. In general, water is pumped into the Basin from the Sacramento River and NCC as irrigation water and returned to the perimeter drainage channels via RD 1000's interior drainage system.

Several irrigation canals, pipelines, wells, and pump stations exist along the Sacramento River east levee. These include the Elkhorn Main Irrigation Canal (Elkhorn Canal), which runs parallel to the Sacramento River east levee from the North Drainage Canal to just south of West Elkhorn Boulevard, and the Riverside Main Irrigation Canal (Riverside Canal), which runs parallel to the east levee from approximately 1 mile north of San Juan Road to approximately Orchard Lane. These NCMWC canals are fed by three pumping plants on the Sacramento River (**Plate 1-9**). They have earthen embankments that allow water levels to be maintained above surrounding ground surfaces so that water can be delivered to agricultural receiving lands by gravity flow. The NCMWC also operates two pumps along the NCC south levee that provide irrigation water to agricultural lands in the northern portion of the Basin. NCMWC irrigation systems and several other landowner-operated systems along the Sacramento River east levee will need to be relocated to accommodate improvements to these levees. The new facilities along the Sacramento River east levee could provide a sustainable long-term source of agricultural irrigation water in the western and northern portions of the Basin that are expected to remain in some form of agriculture or open space use to accommodate the Airport and two of the three major blocks of habitat being assembled by TNBC.

RD 1000 operates several drainage pumping plants that could be affected by levee improvement activity. Pumping Plant No. 2, located in Sacramento River east levee Reach C:4B, pumps drain water from the lower end of the North Drainage Canal; Pumping Plant No. 5, located in Sacramento River east levee Reach B:10, pumps water from the West Drainage Canal; Pumping Plant No. 3, located in Sacramento River east levee Reach B:13, pumps drain water from the West Drainage Canal; Pumping Plant No. 1, located in Sacramento River east levee Reach A:20A, pumps drain water from the Main Drainage Canal; and Pumping Plant No. 4, located in NCC

Reach D:2, pumps drain water from the upper end of the North Drainage Canal; Pumping Plant No. 5, located in Sacramento River east levee Reach B:10, pumps drain water from the West Drainage Canal; Pumping Plant No. 8, located on the NEMDC west levee between Del Paso Road and North Market Boulevard, pumps drain water from the C-1 Drain; and Pumping Plant No. 6, located on the NEMDEC west levee between Elverta Road and Elkhorn Boulevard, pumps drain water from the E Drain. These pumping facilities include discharge pipelines that would need to be relocated as part of the levee improvements in these locations. The City of Sacramento operates the Willow Creek drainage pumping station that is located in Sacramento River east levee Reach A:19B; Pump Station No. 58, which is located on the American River north levee at Asuza Street; and Pump Station No. 102, which is located on the NEMDC west levee in Gardenland Park.

The major irrigation and drainage facilities that would be affected by the project are discussed in Section 2.3.3.3, "Irrigation and Drainage Components."

3.5.2.5 GROUNDWATER HYDROLOGY

Basin and Aquifer Description

The Natomas Basin lies in the North American Subbasin within the Sacramento Groundwater Basin. The North American Subbasin is bounded on the north by the Bear River, on the west by the Feather and Sacramento Rivers, and on the south by the Sacramento River in the west and the American River in the east. The eastern boundary is a north-south line extending from the Bear River south to Folsom Lake, which passes about 2 miles east of the town of Lincoln (see **Plates 1-1** and **1-2** for general locations). The eastern boundary represents the approximate edge of the alluvial basin, where little or no groundwater flows into or out of the groundwater basin from the rock of the Sierra Nevada (DWR 1997). The eastern portion of the subbasin is characterized by low, rolling dissected uplands. The western portion is nearly a flat flood basin for the Bear, Feather, Sacramento, and American Rivers, and several small east side tributaries. The general direction of drainage is west-southwest at an average grade of about 5% (DWR 2003).

DWR Bulletin 118 (DWR 2003) describes the aquifer system in the subbasin as heterogeneous and consisting of many discontinuous beds of clay, silt, sand, and gravel. The water-bearing materials of the subbasin are dominated by unconsolidated continental deposits of Late Tertiary and Quaternary age deposits that include Miocene/Pliocene volcanics, older alluvium, and younger alluvium. Younger alluvium consisting of alluvial flood basin and stream channel deposits is present in the upper 100 feet in areas along and adjacent to the Sacramento and American Rivers. Sand and gravel zones, along with dredger tailings that are found sporadically along the American River, are highly permeable and yield significant quantities of water to wells. Older alluvium, deposited during Pliocene and Pleistocene times and occurring over the area between the Sierra Nevada foothills and the valley axis, consists of loosely to moderately compacted sand, silt, and gravel. Permeability varies considerably in these alluvial deposits (Valley Springs, Laguna, and Fair Oaks formations), which occupy the upper 200 to 300 feet of the aquifer system. Groundwater in the older alluvium is typically unconfined, although semi-confined conditions exist on localized levels. The Mehrten and older geologic units can be characterized as composing the lower aquifer system, which is generally deeper than 300 feet toward the west side of the subbasin. Typically, the level of confinement increases with depth. The cumulative thickness of these deposits increases from a few hundred feet near the Sierra Nevada foothills on the east to over 2,000 feet along the western margin of the subbasin. Most of the groundwater is produced in the northern portion of the subbasin. (DWR 2003.)

Groundwater Recharge and Local Levels

Major recharge to the local aquifer system generally occurs along active river and stream channels where extensive sand and gravel deposits exist, particularly in the American River and Sacramento River channels (Sacramento Groundwater Authority [SGA] 2002). Where surface water is hydrologically disconnected from groundwater, it percolates through the unsaturated zone beneath the streambed to the groundwater and is a function of the underlying aquifer materials and water levels in the stream. Some evidence suggests this occurs in

parts of the Sacramento River in northern Sacramento County (SGA 2003). In western Placer County (northeast section of the subbasin), the rivers adjacent to the subbasin, including the Sacramento and Bear Rivers, and the major streams, ravines, and creeks that cross the valley floor, are the main sources of recharge (Placer County Water Agency 2003). Other sources of recharge within the system include inflow of groundwater generally from the northeast; subsurface recharge from fractured geologic formations to the east; and deep percolation from applied surface water, precipitation, and small streams. The extensive agricultural operations in the Natomas Basin have also contributed to recharge there, with the portion of applied irrigation water in excess of crop demands becoming recharge water through deep percolation (SGA 2003).

Groundwater levels average 10 to 25 feet below ground surface in the Natomas Basin (MWH 2001). According to the SGA, hydrographs for wells in the western part of the North American Subbasin show groundwater levels varying between -5 and 20 feet mean spring groundwater level between wells.

Groundwater Storage

DWR's Bulletin 118 assumed a specific yield of 7% and an aquifer thickness of 200 feet for 200,000 acres within the North American Subbasin. Storage capacity can be estimated for the North American Subbasin by applying the same assumptions as previous DWR studies (DWR 1997a), which indicated a specific yield of 7% and an assumed thickness of 200 feet over the entire 351,000-acre subbasin. The result is an estimated storage capacity of approximately 4.9 million acre-feet (DWR 2003).

Groundwater Budget

Luhdorff & Scalmanini Consulting Engineers (LSCE) prepared a report in November 2008 evaluating the potential groundwater impacts of the NLIP (see **Appendix C2**) (LSCE 2008). The report includes a groundwater budget for existing conditions (without NLIP construction activities) in the Natomas Basin based on the final water year of the 1970–2004 calibration period for the Sacramento County Integrated Groundwater and Surface Water Model. The model results for 2004, shown in **Table 3.5-2**, are grouped into inflow and outflow components, with the change in storage representing the difference between the inflow and the outflow. The simulated change in storage shows a decline of almost 5,000 AFY. Divided by the area of the Natomas Basin, this represents a small decrease in storage on a per acre basis of less than 0.1 acre-foot per acre per year.

Table 3.5-2
Simulated Groundwater Budget for Natomas Basin—Existing Conditions

	Water Budget Component	2004 Simulation (AFY)
Inflow	Deep Percolation (including Canal Seepage)	31,429
	Recharge from Sacramento River	6,469
	Recharge from American River	1,086
	Boundary Inflow from West	10,365
	Subsurface Inflow from North and South	2,955
	Total Inflow	**52,304**
Outflow	Groundwater Pumping	35,537
	Subsurface Outflow to East	21,738
	Subsurface Outflow to South	0
	Total Outflow	**57,275**
Inflow minus Outflow	**Change in Storage**	**-4,971**

Note: AFY = acre-feet per year
Source: Data adapted by EDAW/AECOM (now AECOM) in 2008 from LSCE 2008

3.6 WATER QUALITY

3.6.1 REGULATORY SETTING

3.6.1.1 FEDERAL

The following Federal law related to water quality is relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Clean Water Act (Section 404).

3.6.1.2 STATE

Clean Water Act (Section 401)

Under Federal law, EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). Section 303 of the Clean Water Act (CWA) requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated beneficial uses of the water body in question, and (2) criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, EPA has delegated responsibility to the State Water Resources Control Board (SWRCB) and its nine regional water quality control boards (RWQCBs) for identifying beneficial uses, adopting applicable water quality objectives, and issuing National Pollutant Discharge Elimination System (NPDES) permits.

Under CWA Section 401(a)(1), applicants for a Federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects with a Federal component that may affect state water quality (including projects that require Federal agency approval such as issuance of a Section 404 permit) must also comply with CWA Section 401. The Section 401 water quality certification certifies that the proposed activity will not violate state water quality standards. The RWQCBs administer the Section 401 program with the intent of prescribing measures necessary to avoid, minimize, or mitigate adverse impacts of proposed projects on water quality.

A Section 401 water quality certification has been obtained, or is in the process of being obtained for all previously approved NLIP project phases. To implement the Phase 4b Project, the project proponent(s) is applying to the Central Valley RWQCB for Section 401 water quality certification for the Adjacent Levee Alternative (Proposed Action).

Porter-Cologne Water Quality Control Act and Clean Water Act (Section 402)

The SWRCB and RWQCBs regulate discharges of waste into waters of the United States through NPDES permits, authorized under Section 402 of the CWA, and regulated discharges of waste into waters of the state through waste discharge requirements (WDRs), authorized under the state's Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The RWQCBs issue NPDES permits and WDRs to ensure that projects that may discharge wastes to land or water conform to water quality objectives and policies and procedures of the applicable water quality control plans. The Porter-Cologne Act defines waters of the state as "any surface water or ground water, including saline waters, within the boundaries of the state." Some waters that qualify as waters of

the state, such as certain isolated wetlands and groundwater, do not necessarily qualify as waters of the United States.

SWRCB General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 99-08-Division of Water Quality [DWQ]) is applicable to all land-disturbing construction activities that would affect 1 acre or more. NPDES permits involve similar processes, including submittal of notices of intent (NOI) to discharge to the Central Valley RWQCB and implementation of best management practices (BMPs) to minimize those discharges. The Central Valley RWQCB may also issue site-specific WDRs, or waivers to WDRs, for certain waste discharges to land or waters of the state.

Construction activities subject to the general construction activity permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters. The permit also requires dischargers to consider the use of post-construction permanent BMPs that will remain in service to protect water quality throughout the life of the project. Types of BMPs include source controls, treatment controls, and site planning measures.

Activities subject to the NPDES general permit for construction activity must develop and implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP includes a site map and description of construction activities and identifies the BMPs that will be employed to prevent soil erosion and discharge of other construction related pollutants, such as petroleum products, solvents, paints, cement, that could contaminate nearby water resources. A monitoring program is generally required to ensure that BMPs are implemented according to the SWPPP and are effective at controlling discharges of storm water related pollutants.

On September 2, 2009, SWRCB approved important changes to Order 99-08-DWQ. The amended general permit (Order 2009-0009-DWQ) will become effective on July 1, 2010 and differs from Order 99-08-DWQ relating to the following:

- approach to risk-based permitting,
- rainfall erosivity waiver requirements,
- technology-based numeric action levels,
- technology-based numeric effluent limitations,
- specified minimum requirements,
- project site soil characteristics monitoring and reporting,
- effluent monitoring and reporting,
- receiving water monitoring and reporting,
- post-construction storm water performance standards,
- rain event action plan requirements,
- annual reporting,
- certification/training requirements for key project personnel, and
- linear underground/overhead project requirements.

As for all previous phases of the NLIP, the project proponent(s) would implement BMPs, prepare and implement a SWPPP, and comply with NPDES permit conditions for the Phase 4b Project.

Basin Plan

Pursuant to the Porter-Cologne Act, the Central Valley RWQCB prepares and updates the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan) every 3 years; the most recent update was completed in September 2009 (Central Valley RWQCB 2009). The Basin Plan describes the officially designated beneficial uses for specific surface water and groundwater resources and the enforceable water quality objectives necessary to protect those beneficial uses. The Natomas Basin is located within the Central Valley RWQCB's jurisdiction and is subject to the Basin Plan.

The Basin Plan includes numerical and narrative water quality objectives for physical and chemical water quality constituents. Numerical objectives are set for temperature, dissolved oxygen, turbidity, and pH; total dissolved solids, electrical conductivity, bacterial content, and various specific ions; trace metals; and synthetic organic compounds. Narrative objectives are set for parameters such as suspended solids, biostimulatory substances (e.g., nitrogen and phosphorus), oil and grease, color, taste, odor, and aquatic toxicity. Narrative objectives are often precursors to numeric objectives. The primary method used by the Central Valley RWQCB to ensure conformance with the Basin Plan's water quality objectives and implementation policies and procedures is to issue WDRs for projects that may discharge wastes to land or water. WDRs specify terms and conditions that must be followed during the implementation and operation of a project.

3.6.1.3 REGIONAL AND LOCAL

Sutter County General Plan

The Public Facilities and Services Element and Conservation/Open Space Element of the *Sutter County General Plan* (Sutter County 1996a) include the following policies that may be relevant to the NLIP, including the Phase 4b Project:

- **Policy 3.D-2:** The County shall require new development to adequately mitigate increases in storm water flows and/or volume and to avoid cumulative increases in downstream flows.
- **Policy 3.D-5:** The County shall require new development projects to provide adequate drainage facilities.
- **Policy 4.A-4:** Monitoring of agricultural water runoff should be encouraged to ensure that pollutants are not being returned to the overall water system.

Sacramento County General Plan

The Conservation Element of the *Sacramento County General Plan* (Sacramento County 1993) includes the following policies that may be relevant to the NLIP, including the Phase 4b Project:

- **Policy CO-10:** Development within newly urbanizing areas shall incorporate runoff control measures in their design or participate in an areawide runoff control management effort consistent with the urban runoff management program developed by the Public Works Department.
- **Policy CO-13:** Roads and structures shall be designed, built and landscaped so as to minimize erosion during and after construction.
- **Policy CO-15:** Erosion protection measures and on-site ponding shall be required for all borrow pits and surface mining operations.

City of Sacramento General Plan

The Environmental Resources Element of the *City of Sacramento 2030 General Plan* (City of Sacramento 2009) includes the following goal and policies that may be relevant to the NLIP, including the Phase 4b Project:

- **Goal ER 1.1 Water Quality Protection:** Protect local watersheds, water bodies and groundwater resources, including creeks, reservoirs, the Sacramento and American rivers, and their shorelines.
- **Policy ER 1.1.3 Stormwater Quality:** The City shall control sources of pollutants and improve and maintain urban runoff water quality through storm water protection measures consistent with the City's National Pollution Discharge Elimination System (NPDES) Permit.

- **Policy ER 1.1.4 New Development:** The City shall require new development to protect the quality of water bodies and natural drainage systems through site design, source controls, storm water treatment, runoff reduction measures, best management practices (BMPs) and Low Impact Development (LID), and hydromodification strategies consistent with the city's NPDES Permit.

- **Policy ER 1.1.7 Construction Site Impacts:** The City shall minimize disturbances of natural water bodies and natural drainage systems caused by development, implement measures to protect areas from erosion and sediment loss, and continue to require construction contractors to comply with the City's erosion and sediment control ordinance and stormwater management and discharge control ordinance.

City of Sacramento Stormwater Management and Discharge Control Code

The City Stormwater Management and Discharge Control Code (Chapter 13.16 of the City Code) is intended to control non-stormwater discharges to the stormwater conveyance system; eliminate discharges to the stormwater conveyance system from spills, dumping, or disposal of materials other than stormwater; and reduce pollutants in urban stormwater discharges to the maximum extent practicable. Non-stormwater discharges are prohibited except where the discharge is regulated under a NPDES permit (see the description of the NPDES in the discussion of state water quality regulations above). Discharges of pumped groundwater not subject to a NPDES permit may be permitted to discharge to the stormwater conveyance system upon written approval from the City.

City of Sacramento Grading, Erosion, and Sediment Control Ordinance

The City Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code) sets forth rules and regulations to control land disturbances, landfill, soil storage, pollution, and erosion and sedimentation resulting from construction activities. With limited exceptions, grading approval must be received from the City of Sacramento Department of Utilities before construction. All project proponents, regardless of project location, are required to prepare and submit separate erosion and sediment control plans applicable to the construction and postconstruction periods. The ordinance also specifies other requirements, such as written approval from the City for grading work within the right-of-way of a public road or street, or within a public easement.

City of Sacramento Stormwater Quality Improvement Plan (2007)

The City of Sacramento Stormwater Quality Improvement Program is a comprehensive program comprised of various program elements and activities designed to reduce stormwater pollution to the maximum extent practicable and eliminate prohibited non-stormwater discharges in accordance with Federal and state laws and regulations. These laws and regulations are implemented through NPDES municipal stormwater discharge permits (see the description of the NPDES in the discussion of state water quality regulations above). In 1990, the County of Sacramento and the Cities of Sacramento, Folsom, and Galt applied for and received one of the first area-wide NPDES stormwater permits in the country and began development of core stormwater management program elements and activities to address local urban runoff water quality problems. The Stormwater Quality Improvement Plan outlines and directs the program's implementation (City of Sacramento 2007).

3.6.2 ENVIRONMENTAL SETTING

The East Drainage Canal and the West Drainage Canal drain large portions of the Natomas Basin. The Main Drainage Canal conveys the combined flows of the East and West Drainage Canals from their confluence southwest of the I-80/I-5 interchange through South Natomas west of I-5. Drainage water from the Main Drainage Canal is pumped into the Sacramento River. Currently, seven pumping sites remove stormwater from the Natomas Basin. Five sites pump into the Sacramento River, one pumps into the NCC, and four RD 1000 sites (Pumping Plant No. 6, Pumping Plant No. 8, and City of Sacramento Gardenland and Azuza Pump Stations) pump into the NEMDC. The NEMDC conveys drainage water from Dry Creek, Arcade Creek, and a large portion of the Natomas area north of the confluence with Dry Creek. The NEMDC outfalls to the Sacramento River are at

the northern edge of Discovery Park near the confluence of the Sacramento and American Rivers. Therefore, the Sacramento River is a receiving water for much of the agricultural drainage from the Natomas Basin. Agricultural drainage water contributes salts, nutrients, pesticides, trace elements, sediments, and other byproducts that could affect the water quality of the Sacramento River. In addition to agricultural drainage, urban stormwater runoff is discharged to the Sacramento River, the American River, and the NEMDC via pumps operated by the City of Sacramento, including City Sump 160, City Sump 58, and City Sump 102. Urban stormwater runoff contains sediments, nutrients, pathogens, oil and grease, metals, and pesticides.

3.6.2.1 SURFACE WATER QUALITY

Surface water quality in the hydrologic region is generally good. Possible types of contamination that can affect water quality include turbidity; pesticides and fertilizers from agricultural runoff; water temperature exceedances; and toxic heavy metals, such as mercury, copper, zinc, and cadmium from acid mine drainage (USGS 2000, DWR 2005). The portion of the Sacramento River forming the southern boundary of the NLIP, including the Phase 4b Project area, is part of a 16-mile segment from Knights Landing to the Sacramento–San Joaquin Delta that is on the Section 303(d) list for mercury from abandoned mines and toxicity from unknown sources. In addition, the portion of the American River in the NLIP, including the Phase 4b Project area, is part of a 27-mile segment from Nimbus Dam to the confluence with the Sacramento River that is also on the Section 303(d) list for mercury from abandoned mines and toxicity from unknown sources (SWRCB 2006).

As defined by the Basin Plan (Central Valley RWQCB 2009), the following are the designated beneficial uses for the Sacramento River and all tributaries from the Colusa Basin Drain, upstream of the NLIP, including the Phase 4b Project area to the I Street Bridge in Sacramento:

- municipal, industrial, and agricultural supply;
- irrigation;
- contact and noncontact recreation;
- coldwater fish habitat, migration, and spawning;
- warm water fish habitat, migration, and spawning;
- wildlife habitat;
- power generation; and
- navigation.

3.6.2.2 GROUNDWATER QUALITY

The NLIP, including the Phase 4b Project area, is in the North American Groundwater Subbasin, which lies in the eastern central portion of the Sacramento Valley Groundwater basin (see description in Section 3.5.2.5, "Groundwater Hydrology").

Although there are many areas of good quality groundwater in the North American Subbasin, some areas within the subbasin have shown elevated levels of total dissolved solids (TDS), chloride, sodium, bicarbonate, boron, fluoride, nitrate, iron manganese, and arsenic, based on applicable water quality standards and guidelines for domestic and irrigation uses. An area between the Airport and the Bear River to the north has high levels of TDS, chloride, sodium, bicarbonate, manganese, and arsenic (DWR 2006).

3.7 BIOLOGICAL RESOURCES

3.7.1 REGULATORY SETTING

3.7.1.1 FEDERAL

The following Federal laws related to biological resources are relevant to the NLIP, including the Phase 4b Project, and are described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Clean Water Act (Section 404);
- Fish and Wildlife Coordination Act of 1934, as Amended;
- Endangered Species Act of 1973, as Amended;
- Migratory Bird Treaty Act of 1918;
- Bald and Golden Eagle Protection Act of 1940;
- Wild and Scenic Rivers Act;
- Executive Order 11990, Protection of Wetlands; and
- Sustainable Fisheries Act.

3.7.1.2 STATE

California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA), a permit from the California Department of Fish and Game (DFG) is required for projects that could result in the take of a plant or animal species that is state-listed as threatened or endangered. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species, but the CESA definition of take does not include "harming" or "harassing," as the Federal ESA definition does. As a result, the threshold for take is higher under CESA than under ESA. The project proponent(s) will coordinate with DFG to discuss CESA compliance requirements and will apply to DFG for take authorization under Section 2081 of the California Fish and Game Code. Similar to previous NLIP phases, the project proponent(s) will obtain a Section 2081 permit prior to Phase 4b Project construction and comply with its conditions.

California Fish and Game Code Section 1602—Streambed Alteration Agreement

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by DFG under Section 1602 of the California Fish and Game Code. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying DFG:

- substantially divert or obstruct the natural flow of, or substantially change or use any material from, the bed, channel, or bank of any river, stream, or lake; or

- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. DFG's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A DFG streambed alteration agreement must be obtained for any project that would affect a river, stream, or lake. Similar to previous NLIP phases, the project proponent(s) will apply for a Section 1602 Streambed Alteration Agreement for the Phase 4b Project.

California Fish and Game Code Sections 3503 and 3503.5—Protection of Bird Nests and Raptors

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations of these codes include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Section 3503.5 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction. This statute does not provide for the issuance of any type of incidental take permit.

California Fish and Game Code—Fully Protected Species

Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These statutes prohibit take or possession of fully protected species and do not provide for authorization of incidental take of fully protected species. DFG has informed non-Federal agencies and private parties that their actions must avoid take of any fully protected species.

Porter-Cologne Water Quality Control Act

See discussion under Section 3.6, "Water Quality."

California Wild and Scenic Rivers Act

See discussion under Section 3.13, "Recreation."

3.7.1.3 REGIONAL AND LOCAL

Sutter County General Plan

The Conservation/Open Space and Natural Resources Element of the *Sutter County General Plan* (Sutter County 1996a) addresses the conservation, development, and use of natural resources, including water and its hydraulic force, forests, soils, rivers and other waters, fisheries, wildlife, minerals and other natural resources. The following conservation resource goals and policies may be relevant to the project:

- **Goal 4.A:** To preserve and protect the water resources of the County.
  - **Policy 4.A-1:** The County shall require development setbacks from all water courses.
- **Goal 4.B.** To protect wetland and riparian areas throughout Sutter County.
  - **Policy 4.B-1:** The County shall require new development to fully mitigate the loss of federally regulated wetlands to achieve a "no net loss" through any combination of avoidance, minimization, or compensation.
  - **Policy 4.B-2:** The County shall discourage direct discharge of surface runoff into wetland areas. New development shall be designed in such a manner that pollutants and siltation will not significantly affect wetlands.
  - **Policy 4.B-3:** The County encourages the preservation and restoration of natural wetland environments when feasible and practical as part of the development review process. Additionally, the County shall encourage and support the Resource Conservation District programs that facilitate these objectives if the programs do not significantly affect agricultural operations.

- **Policy 4.B-4:** The County will encourage the creation and use of wetland mitigation banks as long as their creation and existence will not adversely impact existing and/or planned agriculture or urban development.

- **Goal 4.C:** To protect and enhance habitats that support fish and wildlife species.

  - **Policy 4.C-1:** The County shall strive to preserve those areas of wildlife habitat designated "high habitat value" as shown on the biological sensitivity map in Chapter 9 of the Background Report.

  - **Policy 4.C-2:** The County shall encourage preservation and proper management of those areas designated "moderate habitat value" on the biological sensitivity map in Chapter 9 of the background report.

  - **Policy 4.C-3:** The County shall support the preservation and re-establishment of fisheries in the rivers and streams within the County.

  - **Policy 4.C-4:** The County should participate in the process of developing mitigation programs for threatened and endangered species to ensure that Sutter County's agricultural, economic, fiscal, and future urbanization and natural resource goals and policies are met.

  - **Policy 4.C-5:** The County supports the preservation and protection of waterfowl resources and their habitat.

  - **Policy 4.C-6:** The County encourages the preservation of existing wildlife corridors between natural habitat areas to maintain biodiversity and prevent the creation of biological islands. This would also include promoting the re-establishment of previous corridors where feasible.

  - **Policy 4.C-7:** The County encourages the preservation of rare, threatened or endangered animal species.

- **Goal 4.D:** To preserve and protect the vegetation resources of Sutter County.

  - **Policy 4.D-1:** The County shall encourage the preservation of important areas of natural vegetation, including, but not limited to, oak woodlands, riparian areas, and vernal pools.

  - **Policy 4.D-2:** The County encourages the preservation of rare, threatened, or endangered plant species.

  - **Policy 4.D-3:** The County shall require that new development projects avoid, to the maximum extent possible, ecologically-fragile areas (e.g., areas of rare, threatened or endangered species of plants, riparian areas, vernal pools).

  - **Policy 4.D-4:** The County shall strive to protect major groves of native trees located in the unincorporated areas of the County.

  - **Policy 4.D-5:** The County shall encourage the use of native and drought tolerant plant materials in all public and private revegetation/landscaping projects.

- **Goal 4.E:** To conserve, protect and enhance open space lands and natural resources in Sutter County.

  - **Policy 4.E-1:** The County shall support the preservation of natural land forms, natural vegetation, and natural resources as open space to the maximum extent feasible.

Sacramento County General Plan

The *Sacramento County General Plan* is currently being updated (the DEIR was issued in spring 2009), but is not yet adopted. The Conservation Element of the existing *Sacramento County General Plan* (Sacramento County 1993) provides overall guidance for resource conservation in Sacramento County and includes several resource conservation goals and objectives. It includes a specific goal to preserve and protect fisheries in county waterways and describes policies and programs under four objectives:

1. Water flows monitored and maintained, when climatic conditions allow, to promote fish propagation and migration.

2. Maintenance of channelized areas to reduce detritus accumulation and increase fish populations.

3. Water quality and runoff levels maintained to provide a healthy aquatic environment for fisheries.

4. Riparian vegetation and topographic diversity maintained by stream channel and bank stabilization projects.

The policies associated with the four objectives above are:

- **CO-151:** Provide unobstructed water flows throughout the network of natural waterways by prohibiting blockage, tunneling, or obstruction of contiguous stream channels.

- **CO-152:** Protect and preserve migratory route for anadromous species.

- **CO-153:** Reduce mortality of migrating fish by requiring screens or similar bypass apparatus on diversion pumps.

The Conservation Element of the existing *Sacramento County General Plan* (Sacramento County 1993) includes policies concerning native trees, flood channels, stream courses, and waterways. Policies CO-130 through CO-136, which apply to discretionary projects, are intended to conserve native oaks and other native tree species. To preserve the natural characteristics of these areas, policies in the Conservation Element call for maintenance of riparian vegetation, buffer zones adjacent to stream corridors that contain riparian vegetation, and unlined watercourses. Policy CO-107 requires that topographic diversity and variation be retained when channels are realigned or modified, including maintaining meandering characteristics, varied berm width, and naturalized side slope. In addition, the Open Space Element contains general policies related to the protection of open space areas. Policy OS-1 calls for the permanent protection, as open space, of areas of natural resource value, including wetland preserves, riparian corridors, woodlands, and floodplains. Policy OS-2 promotes the maintenance of open space and natural areas that are interconnected and of sufficient size to protect biodiversity, accommodate wildlife movement, and sustain ecosystems (Sacramento County 1993).

City of Sacramento General Plan

The *City of Sacramento General Plan 2030*, adopted on March 3, 2009, contains goals and policies related to the protection and enhancement of open space, natural areas, and significant wildlife and vegetation in the City as integral parts of a sustainable environment within a larger regional ecosystem (City of Sacramento 2009). The City has a program with USACE and SAFCA in which it works with SAFCA and other responsible agencies to resolve floodplain restrictions. The following Natural and Open Space Protection policies from the *City of Sacramento General Plan 2030* may be relevant to the NLIP, including the Phase 4b Project:

- **ER 2.1.2 Conservation of Open Space:** The City shall continue to preserve, protect, and provide access to designated open space areas along the American and Sacramento Rivers, floodways, and undevelopable floodplains.

- **ER 2.1.2 Conservation of Open Space:** The City shall continue to preserve, protect, and provide access to designated open space areas along the American and Sacramento Rivers, floodways, and undevelopable floodplains.

- **ER 2.1.3 Natural Lands Management:** The City shall promote the preservation and restoration of contiguous areas of natural habitat throughout the city and support their integration with existing and future regional preserves.

- **ER 2.1.4 Retain Habitat Areas:** The City shall retain plant and wildlife habitat areas where there are known sensitive resources (e.g., sensitive habitats, special-status, threatened, endangered, candidate species, and species of concern). Particular attention shall be focused on retaining habitat areas that are contiguous with other existing natural areas and/or wildlife movement corridors.

- **ER 2.1.5 Riparian Habitat Integrity:** The City shall preserve the ecological integrity of creek corridors, canals, and drainage ditches that support riparian resources by preserving native plants and, to the extent feasible, removing invasive nonnative plants. If not feasible, adverse impacts on riparian habitat shall be mitigated by the preservation and/or restoration of this habitat at a 1:1 ratio, in perpetuity.

- **ER 2.1.6 Wetland Protection:** The City shall preserve and protect wetland resources including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands, to the extent feasible. If not feasible, the mitigation of all adverse impacts on wetland resources shall be required in compliance with State and Federal regulations protecting wetland resources, and if applicable, threatened or endangered species. Additionally, the City shall require either on- or off-site permanent preservation of an equivalent amount of wetland habitat to ensure no-net loss of value and/or function.

- **ER 2.1.7 Annual Grasslands:** The City shall preserve and protect grasslands and vernal pools that provide habitat for rare and endangered species. If not feasible, the mitigation of all adverse impacts on annual grasslands shall comply with State and Federal regulations protecting foraging habitat for those species known to utilize this habitat.

- **ER 2.1.8 Oak Woodlands:** The City shall preserve and protect oak woodlands, and/or significant stands of oak trees in the city that provide habitat for common native, and special status wildlife species. If not feasible, the mitigation of all adverse impacts on oak woodlands shall comply with the standards of the Oak Woodlands Conservation Act.

- **ER 2.1.9 Wildlife Corridors:** The City shall preserve, protect, and avoid impacts to wildlife corridors. If corridors are adversely affected, damaged habitat shall be replaced with habitat of equivalent value.

- **ER 2.1.10 Habitat Assessments:** The City shall consider the potential impact on sensitive plants for each project requiring discretionary approval and shall require pre-construction surveys and/or habitat assessments for sensitive plant and wildlife species. If the pre-construction survey and/or habitat assessment determines that suitable habitat for sensitive plant and/or wildlife species is present, then either (1) protocol-level or industry-recognized (if no protocol has been established) surveys shall be conducted; or (2) presence of the species shall be assumed to occur in suitable habitat on the project site. Survey Reports shall be prepared and submitted to the City and DFG or USFWS (depending on the species) for further consultation and development of avoidance and/or mitigation measures consistent with state and federal law.

- **ER 2.1.11 Agency Coordination:** The City shall coordinate with State and Federal resource agencies (e.g., DFG, U.S. Army Corps of Engineers, and USFWS) to protect areas containing rare or endangered species of plants and animals.

- **ER 2.1.12 Natomas Basin Habitat Conservation Plan:** The City shall continue to participate in and support the policies of the Natomas Basin Habitat Conservation Plan for the protection of biological resources in the Natomas Basin.

- **ER 2.1.13 Support Habitat Conservation Plan Efforts:** The City shall encourage and support regional habitat conservation plans such as the South Sacramento Habitat Conservation Plan to conserve and manage habitat for special-status species.

Natomas Basin Habitat Conservation Plan

The 2003 *Natomas Basin Habitat Conservation Plan* was prepared and adopted by the City of Sacramento, Sutter County, and TNBC (City of Sacramento, Sutter County, and TNBC 2003). An HCP is a planning document required under Section 10 of the Federal ESA and was developed in consultation and coordination with USFWS to promote biological conservation in conjunction with economic and urban development in the Natomas Basin. The NBHCP establishes a multi-species conservation program to minimize and mitigate the expected loss of habitat values and incidental take of "covered species" that could result from urban development and operation and maintenance of irrigation and drainage systems. The NBHCP authorizes incidental take associated with 17,500 acres of urban development in southern Sutter County and within the City and County of Sacramento (i.e., 8,050 acres for the City of Sacramento, 7,467 acres for Sutter County, and 1,983 acres of Metro Air Park in Sacramento County).

The NLIP, including the Phase 4b Project, is required to comply with the NBHCP. The potential for the Phase 4b Project to conflict with this adopted plan is addressed in this EIS/EIR.

Local Tree Ordinances

Sacramento County

The Tree Preservation Ordinance of Sacramento County (Sacramento County Code 480 Section 1, 1981) requires the protection of native oak trees within Sacramento County. This ordinance requires a permit for the removal of trees or for grading, excavating, or trenching within the dripline of a tree within the jurisdictional boundaries of the ordinance. A "tree" is defined as any living native oak tree having at least one trunk of 6 inches or more in diameter or a multi-trunked native oak tree having an aggregate diameter of 10 inches or more. Removing woodlands during the NLIP, including the Phase 4b Project, would adversely affect native oaks within this size range as well as other trees that occur within Sacramento County; however, the NLIP, including the Phase 4b Project is not located within the jurisdictional boundaries of the ordinance and, therefore, a permit is not required. The *Sacramento County General Plan* (Sacramento County 1993), described above, contains policies related to the conservation of native trees, with which the NLIP, including the Phase 4b Project, would be required to comply.

City of Sacramento

Title 12 of the City of Sacramento Municipal Code addresses the protection of trees within the city boundaries, including general protection of all trees on city property and specific protection of heritage trees. Heritage trees include any tree of any species that has a trunk circumference of 100 inches or more and is in good health; any native oak, California buckeye, or western sycamore that has a circumference of 36 inches or greater when a single trunk, or a cumulative circumference of 36 inches or greater when a multi-trunk tree; and any tree 36 inches in circumference or greater in a riparian zone. The NLIP, including the Phase 4b Project, would be required to comply with this ordinance for project components located within the city of Sacramento.

3.7.2 ENVIRONMENTAL SETTING

3.7.2.1 GENERAL BIOLOGICAL RESOURCES

Land Use and Vegetation

Before 1850, vegetation in the Natomas Basin and the remainder of the Sacramento Valley bore little resemblance to its current state. The Sacramento River dominated the area, its banks lined by a riverine growth of oak, western sycamore, Fremont cottonwood, willow, and Oregon ash, up to a mile in width. Drainage from the western slopes of the Sierra Nevada resulted in regular flooding of the Sacramento Valley, rendering the Natomas Basin an area of highly fertile, alluvial soils. The southern portion of the Basin was part of the overlapping American and Sacramento River floodplains. This large floodplain supported large tracts of riparian woodland and scrub, permanent freshwater marsh, and seasonal wetland. It is likely that vernal pools also existed historically in the Natomas Basin, particularly in upland areas in the eastern portion (USFWS, City of Sacramento, and Sutter County 2003).

Currently, the Natomas Basin supports a wide array of land uses and habitat types, including urban, suburban, and rural development; agricultural fields; and remnant and restored native habitat (**Plate 3-3**). **Table 3.7-1** summarizes information compiled for the most recent (2007) categorization of land cover types in the Natomas Basin conducted for TNBC and also identifies the habitat types in the Phase 4b Project area. **Plates 3-4a** through **3-4d** identify the habitat types within the Phase 4b Project area.

Table 3.7-1
Land Cover Types in the Natomas Basin, Including the Phase 4b Project Area

Habitat Type	Natomas Basin (Acres)	Phase 4b Project Area (Acres)
Alfalfa	1,189	3
Fallow rice	7,970	0
Fallow row and grain crops	2,065	41
Fresh emergent marsh	154	9
Fresh emergent marsh (created)	674	0
Grass hay	2,212	5
Grassland (created)	68	0
Irrigated grassland and annual grassland	451	135
Nonhabitat land uses (developed, disturbed/bare, ruderal)	14,226	175
Nonnative annual grassland	5,192	109
Nonriparian woodland	51	30
Open water	340	79
Orchard	184	112
Rice	14,590	944
Riparian scrub	114	15
Riparian woodland	357	1
Row and grain crops (milo, tomatoes, sunflower, wheat)	4,067	611
Seasonal wetland	108	1
Vernal pools [1]	>0.23	<85
Valley oak woodland [2]	192	0
Total	**54,207**	**2,356**

Notes:
[1] Vernal pools are not identified in the Jones & Stokes data set; however, wetland delineations conducted by EDAW/AECOM (now AECOM) in 2007 and 2008 identified this habitat type along the landside of the NEMDC. Jones & Stokes data identifies 85 acres of vernal pool habitat within the Triangle Properties Borrow Area.
[2] Valley oak woodland in the Phase 4b Project area is included with the nonriparian woodland.
Source: Habitat mapping by Jones & Stokes in 2007; data compiled by AECOM in 2009

The southern portion of the Natomas Basin is largely developed, particularly south of Elkhorn Boulevard and east of El Centro Road. The western and northern portions, in contrast, are dominated by agricultural lands. The primary crops produced in the Natomas Basin are rice, corn, grain, and tomatoes. Rice, the most common crop, is generally grown over large areas of contiguous land north of Elkhorn Boulevard, although the amount of land in active rice production has greatly diminished in recent years and many former rice fields are now fallow or support grain crops, such as wheat. Agricultural lands in the southern and western portions support other crops and urban land uses (City of Sacramento, Sutter County, and TNBC 2003).

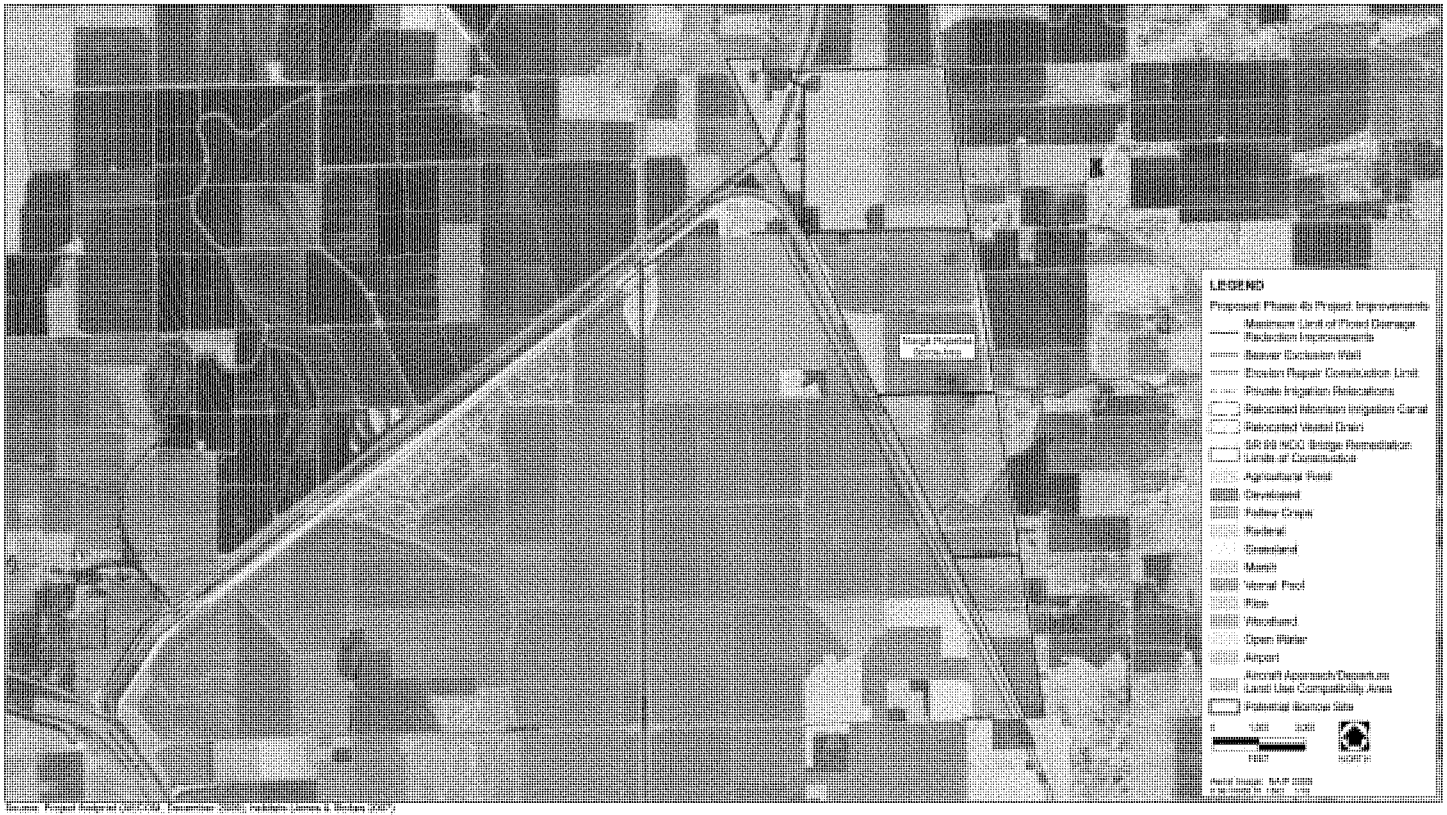
Only small fragments of native habitat persist in the Natomas Basin. Riparian habitat is primarily restricted to a narrow strip along the levees of the Natomas Basin perimeter levee system. Small patches of woodland, scrub, and wetland habitats dominated by native species are scattered throughout the Natomas Basin, most relatively close to the Natomas Basin perimeter levee system or adjacent to other features that support surface water. An extensive network of irrigation and drainage ditches also traverses the Natomas Basin and a growing number of restored marsh habitat patches are being created, primarily in the north. Most of these are owned and managed by TNBC; others are separately managed as Airport mitigation sites.

Residential properties are scattered along the PGCC and NEMDC and increase in density along the Sacramento River east levee Reach A:19A–20 and along and the American River north levee. Levee slope maintenance zones along the landside levee toe are dominated by weedy ruderal vegetation that is regularly maintained via mowing and/or burning. Irrigation/drainage ditches and canals are present along many levee reaches, landward of the vegetation maintenance zones. These ditches generally support little native vegetation and are regularly maintained. Within the Phase 4b Project area, the Riverside Canal (a concrete-lined canal with earthen embankments) runs parallel to the Sacramento River east levee along the landside levee toe in Reach A:16–17. The canal flows south to approximately Bryte Bend Road. The Riverside Canal south of Bryte Bend Road is abandoned. Lateral ditches and canals also extend into the Phase 4b Project area. Native valley riparian vegetation is found along the Sacramento River east levee, American River north levee, NCC, and NEMDC. To the west of Fisherman's Lake lie several TNBC tracts that comprise the TNBC's Fisherman's Lake preserve; these tracts include the Natomas Farms, Souza, Rosa East, Rosa Central, Cummings, and Alleghany tracts. The South Fisherman's Lake Borrow Area and the West Lakeside School Site in the Phase 4b Project area include parcels that lie adjacent to and between TNBC Fisherman's Lake tracts and private parcels that include a mix of rice and row/field crops and managed marshland. TNBC parcels are present within NEMDC North; these reserves include Betts and Kismat. Bolen West, Frazer, and Lucich North are TNBC parcels that are adjacent to the NCC. Agriculture is the dominant habitat landward of the Sacramento River east levee Reach A:16–18B, NCC, PGCC, and NEMDC North. Urbanized areas are located along the Sacramento River east levee Reach A:19A–20, American River north levee, and NEMDC South.

Wildlife

Before European settlement, the Sacramento area floodplains supported a wide variety and large numbers of wildlife species associated with its riparian habitats, permanent and seasonal wetlands, and oak woodlands and savannas. Much of this habitat has been lost, locally and regionally. Initially, land within the Natomas Basin was converted to agriculture, though more recent land use conversions have been to urban development. As a result, there have been shifts in wildlife use as land uses and habitats have changed. With the conversion to agriculture, the abundance of species restricted to natural habitats likely decreased, and in some cases particular species ceased to occur (City of Sacramento, Sutter County, and TNBC 2003). However, remnant native habitat patches and created habitat associated with drainage and agricultural supply ditches and habitat reserves have allowed remnant wildlife populations to persist within the Natomas Basin. Wildlife species common within the Natomas Basin include black-tailed jackrabbit, Audubon's cottontail, raccoon, striped skunk, California ground squirrel, mule deer, coyote, and river otter. Reptile species that are routinely encountered in the Natomas Basin include gopher snake, common garter snake, and racer snake. Amphibian species that are routinely encountered in the Natomas Basin include Pacific chorus frog and bullfrog.

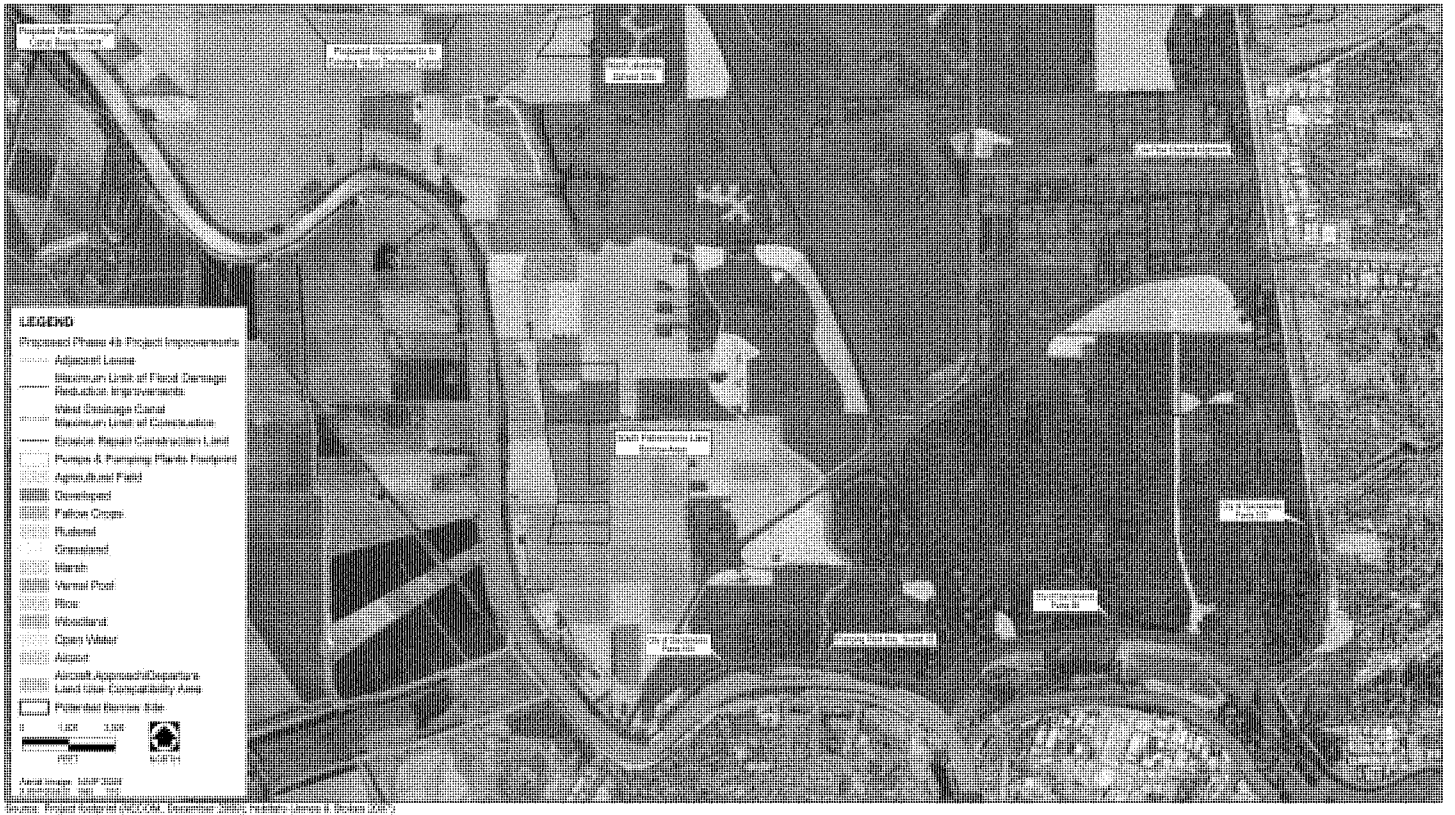
Habitats in the Natomas Basin **Plate 3-3**



Pre-construction Habitat in the Phase 4b Project Area **Plate 3-4a**

Pre-construction Habitat in the Phase 4b Project Area

Plate 3-4b



Pre-construction Habitat in the Phase 4b Project Area **Plate 3-4c**

Pre-construction Habitat in the Phase 4b Project Area

Plate 3-4d

The presence of ditches among the mosaic of agricultural fields and remnant riparian and wetland patches provides important nesting, feeding, and migration corridor habitat for a variety of wildlife species that inhabit the Natomas Basin. Wildlife use is also linked to the Natomas Basin's position in the Pacific Flyway, the westernmost of North America's four flyways, or migration routes. These flyways are defined as geographic regions with breeding grounds in the north, wintering grounds in the south, and a system of migration routes in between. The Central Valley lies at the southerly end of the Pacific Flyway migratory route. Historically, the Central Valley contained approximately 4 million acres of wetlands, including permanent marshes and seasonal wetlands created by winter rains and spring snowmelt from the Sierra Nevada. Today, approximately 300,000 acres remain, providing wintering habitat for 60% of the Pacific Flyway's current waterfowl population and migration habitat for an additional 20% of the population. All together, approximately 10–12 million ducks and geese, along with millions of other water birds, winter in or pass through the Central Valley each year (City of Sacramento, Sutter County, and TNBC 2003). Although most marshes and seasonal wetlands in the Natomas Basin have been converted to agricultural and urban uses, flooded rice fields continue to attract and support migrant waterfowl. Some species also use pasture, harvested rice, and other croplands for foraging (USFWS, City of Sacramento, and Sutter County 2003). Birds common within the Natomas Basin include red-tailed hawk, red-shouldered hawk, American kestrel, barn owl, Brewer's blackbird, red-winged blackbird, western scrub-jay, northern mockingbird, yellow-billed magpie, house finch, and house sparrow.

The NLIP, including the Phase 4b Project, area provides habitat for a variety of wildlife species, ranging from those that use the widely distributed agricultural fields and levee maintenance zones to species that are restricted to remnant patches of native vegetation and the system of irrigation/drainage ditches and canals. Many common wildlife species use the NLIP, including the Phase 4b Project, area and a number of sensitive species also have potential to occur within and adjacent to the levee improvement areas. These sensitive species are discussed further in Section 3.7.2.2, "Sensitive Biological Resources."

Fisheries

Primary waterways supporting fish habitat that occur in the NLIP, including the Phase 4b Project, area include: the NCC, NEMDC, and the lower Sacramento River. The NCC is a tributary to the lower Sacramento River near Verona. The NEMDC is a tributary to the lower Sacramento River immediately upstream of its confluence with the lower American River. [3] All of these waterways are indirectly connected to the irrigation and drainage canals and ditches in the Phase 4b Project area by a number of pumping facilities. These waterways provide important habitat for native anadromous and resident Central Valley fishes, including species that are listed under ESA and CESA, and perform other important ecological functions, as described in Section 3.7.2.2, "Sensitive Biological Resources."

The lower Sacramento River, NEMDC, and NCC provide fish spawning, rearing, and/or migratory habitat for a diverse assemblage of native and nonnative species (**Table 3.7-2**). The use of different areas of these waterways by fish species is influenced by variations in habitat conditions, each species' habitat requirements, life history, and daily and seasonal movements and behavior.

Anthropogenic changes to the flow regimes of the lower Sacramento River have had an effect on many aspects of the habitat quality for fish. Altered flow regimes have resulted in reduced physical processes (e.g., sediment transport and deposition) and artificial seasonal flows (i.e., generally decreased water in winter and increased water in summer) relative to natural conditions. Past modifications of channels for agricultural water conveyance and flood damage reduction purposes have resulted in homogenous, trapezoidal channels lacking instream structure with narrow and sparse bands of riparian vegetation that provide only limited shaded riverine aquatic

[3] The lowermost segment of the NEMDC is adjacent to the waterside of the lower American River north levee and is within the Phase 4b Project area; however, the lower American River is outside of the Phase 4b Project area.

(SRA)[4] habitat functions. The alterations to the lower Sacramento and American Rivers have resulted in marginal conditions that provide only limited habitat functions for most native fish species.

Table 3.7-2
Fish Present in the Natomas Basin, Including the Phase 4b Project Area: Lower Sacramento River, Natomas East Main Drainage Canal, and Natomas Cross Canal

Common Name	Scientific Name	Native (N) or Introduced (I)
Sacramento River winter-run Chinook salmon	*Oncorhynchus tshawytscha*	N
Central Valley spring-run Chinook salmon	*Oncorhynchus tshawytscha*	N
Central Valley fall-/late fall-run Chinook salmon	*Oncorhynchus tshawytscha*	N
Central Valley steelhead/rainbow trout	*Oncorhynchus mykiss*	N
Green sturgeon	*Acipenser medirostris*	N
White sturgeon	*Acipenser transmontanus*	N
Pacific lamprey	*Lampetra tridentate*	N
Sacramento pikeminnow	*Ptychocheilus grandis*	N
Sacramento splittail	*Pogonichthys macrolepidotus*	N
Sacramento sucker	*Catostomus occidentalis*	N
Hardhead	*Mylopharodon conocephalus*	N
California roach	*Lavinia symmetricus*	N
Striped bass	*Morone saxatilus*	I
American shad	*Alosa sapidissima*	I
Largemouth bass	*Micropterus salmoides*	I
Smallmouth bass	*Micropterus dolomieui*	I
White crappie	*Pomoxis annularis*	I
Black crappie	*Pomoxis nigromaculatus*	I
Channel catfish	*Ictalurus punctatus*	I
White catfish	*Ameiurus catus*	I
Brown bullhead	*Ictalurus nebulosus*	I
Bluegill	*Lepomis macrochirus*	I
Green sunfish	*Lepomis cyanellus*	I
Golden shiner	*Notemigonus crysaleucas*	I

Source: Moyle 2002

[4] SRA vegetation and instream tree and shrub debris provide important riverine fish habitat along the lower Sacramento River and its tributaries. SRA habitat is defined as the nearshore aquatic habitat occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this cover type are: (1) an adjacent bank composed of natural, eroding substrates supporting riparian vegetation that either overhang or protrude into the water; and (2) water that contains variable amounts of woody debris, such as leaves, logs, branches, and roots and has variable depths, velocities, and currents. Riparian habitat provides structure (through SRA habitat) and food for fish species. Shade decreases water temperatures, while low overhanging branches can provide sources of food by attracting terrestrial insects. As riparian areas mature, the vegetation sloughs off into the rivers, creating structurally complex habitat consisting of large woody debris that furnishes refugia from predators, creates higher water velocities, and provides habitat for aquatic invertebrates. For these reasons, many fish species are attracted to SRA habitat.

Native species present in the lower Sacramento River, NEMDC, and/or NCC can be separated into anadromous species (i.e., species that spawn in fresh water after migrating as adults from marine habitat) and resident species. Native anadromous species include four runs of Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*O. mykiss*), green and white sturgeon (*Acipenser medirostris* and *A. transmontanus*), and Pacific lamprey (*Lampetra tridentata*). All of these anadromous species are expected to use habitats in the lower Sacramento River. Of these species, Chinook salmon and steelhead seasonally use the Sacramento River during adult upstream and juvenile downstream migrations. The Sacramento River also provides limited rearing habitat functions for juvenile salmon and steelhead during seasonal out-migration periods. Within the NEMDC, only fall-/late fall-run Chinook salmon and steelhead trout are expected to occur. Use of the NEMDC by these species is similar to that in the Sacramento River. Habitat values in the NCC are more degraded due to lack of structure and cover and reduced water quality. Use of this waterway by these species would be limited to occasional strays entering the waterway during periods of migration.

Native resident species include Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Sacramento sucker (*Catostomus occidentalis*), hardhead (*Mylopharodon conocephalus*), California roach (*Lavinia symmetricus*), and rainbow trout (*O. mykiss*). Pikeminnow, splittail, sucker, hardhead, and roach may be present in relatively low numbers in all channels year-round, while resident rainbow trout is generally expected to be found primarily in the lower Sacramento River.

Nonnative anadromous species include striped bass (*Morone saxatilis*) and American shad (*Alosa sapidissima*). Striped bass and American shad are known to use the lower Sacramento River. Nonnative resident species include largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), white and black crappie (*Pomoxis annularis* and *P. nigromaculatus*), channel catfish (*Ictalurus punctatus*), white catfish (*Ameiurus catus*), brown bullhead (*Ictalurus nebulosus*), bluegill (*Lepomis macrochirus*), green sunfish (*L. cyanellus*), and golden shiner (*Notemigonus crysaleucas*). With the exception of the lower Sacramento River, habitat conditions in channels bordering the Natomas Basin, including the NEMDC and NCC, are most favorable for nonnative warm water resident species; therefore, these species are anticipated to be the most abundant in these channels.

3.7.2.2 SENSITIVE BIOLOGICAL RESOURCES

Sensitive biological resources include those that are afforded special protection through CEQA, the California Fish and Game Code (including but not limited to CESA), ESA, and CWA. Special-status species include plants and animals that are legally protected or that are otherwise considered sensitive by Federal, state, or local resource conservation agencies and organizations. These include:

- plant and wildlife species that are listed by CESA and/or ESA as rare, threatened, or endangered;
- plant and wildlife species considered candidates for listing or proposed for listing;
- wildlife species identified by DFG as California Species of Special Concern; and
- plants considered by CNPS to be rare, threatened, or endangered.

Sensitive habitats include those that are of special concern to resource agencies or are afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, Section 404 of the CWA, and the Porter-Cologne Water Quality Control Act.

Sensitive Woodland Habitat

Riparian and landside woodlands in the Natomas Basin provide important nesting and roosting habitat for a wide variety of wildlife species (including special-status species such as Swainson's hawk) and serve as movement corridors for these species within the Basin. As such, they are considered sensitive habitats. Riparian woodlands in particular are rich in biological fauna and flora and provide valuable resources and protection for aquatic habitats. They are considered sensitive habitats subject to DFG jurisdiction California Fish and Game Code Section 1602. Other habitats considered sensitive by DFG include those identified as "rare and worthy of

consideration" in natural communities recognized by the California Natural Diversity Database (CNDDB). These sensitive communities provide essential habitat to special-status species that are often restricted in distribution or decreasing throughout their range. Some woodland patches within the Phase 4b Project area could be categorized as Great Valley cottonwood riparian forest, which is a natural community documented in the CNDDB. Trees protected by county and city policies and ordinances, including native oaks, are also considered sensitive.

Sensitive Aquatic Habitat

Sensitive aquatic habitat includes those habitats that are of special concern to resource agencies or that are afforded specific consideration through ESA, CEQA, Section 1602 of the California Fish and Game Code, Section 404 and 401 of the CWA, or the Sustainable Fisheries Act (as amended). These habitats are of special concern because they may be of high value to plant, wildlife, and fish species and may have a higher potential to support special-status species. They also provide other important ecological functions, such as enhancing flood and erosion control and maintaining water quality. Other sensitive aquatic habitats, including Essential Fish Habitat, are described below.

Irrigation/drainage canals and ditches in the Phase 4b Project area are anticipated to be considered waters of the United States and subject to regulation under CWA Section 404. Other permanently and/or seasonally wet habitats, such as freshwater marsh, seasonal wetland, and vernal pool, could qualify as jurisdictional waters of the United States subject to Section 404 regulation if they are adjacent or abutting other jurisdictional waters of the United States. In the Phase 4b Project area, vernal pools are known to occur along the NEMDC, the Triangle Properties Borrow Area, and along Lower Dry Creek.

Previous wetland delineation reports verified by USACE that cover portions of the Phase 4b Project footprint are include a delineation completed in 2008 that covers the PGCC and the NEMDC South (USACE Reference ID #20081039), a 2007 delineation that covers areas on the landside of the Sacramento River east levee Reaches 1–20 (C:1–4B, B:5A–15, and A:16–20) (USACE Reference ID #200700211), a delineation completed in 2006 for the NCC within the NLIP footprint (USACE Reference ID #200600795), and a delineation for the proposed woodland planting area at Lower Dry Creek east of the NEMDC (USACE Reference ID #200900238). These delineations identified the following features that fall within the Phase 4b Project area as jurisdictional: irrigation/drainage ditches and canals along the landside toe of the levee, irrigated wetlands in rice fields, freshwater marsh habitat, seasonal wetlands, and vernal pools. A delineation of jurisdictional waters of the United States covering the South Fisherman's Lake Borrow Area, the landside of the American River north levee, and the NEMDC North was verified by USACE in April 2010 (USACE Reference ID #200801039); a separate delineation for the West Lakeside School Site has also been submitted to USACE and is currently under review. A delineation has not yet been completed for the West Drainage Canal east of Powerline Road, nor for the Triangle Properties Borrow Area (these will be completed by USACE). Jurisdictional features within these areas are expected to include primarily irrigation/ drainage ditches and irrigated wetlands in rice fields; seasonal wetlands and vernal pools are known to occur in the Triangle Properties Borrow Area.

In addition, the installation of an outfall at City of Sacramento Sump Pump No. 160 in Reach A:19B along the Sacramento River east levee would be within USACE jurisdictional areas. Discharge pipes and outfalls conveying filtered stormwater drainage from the east levee to the east bank of the Sacramento River under the Adjacent Levee Alternative (Proposed Action) might extend to areas within the jurisdiction of CWA Section 404 and/or Section 10 of the Rivers and Harbors Act.

The functional quality of an aquatic resource is considered by USACE as part of the CWA Section 404 regulatory process. Habitat quality may be generally categorized as low, moderate, or high, defined herein as follows:

- **Low**: High levels of disturbance (e.g., vegetation disking for fire clearance purposes, dominance of monotypic stands of nonnative vegetation, presence of human-made structures).

- **Moderate**: Moderate levels of disturbance (e.g., natural plant communities intact with some evidence of nonnative vegetation, low-intensity developments such as trails, selective vegetation management for flood damage reduction purposes).

- **High**: Natural structure and function of biotic community exists, with minimal changes in structure or function evident—i.e., zero to low levels of human disturbance (e.g., natural plant communities intact, no artificial structures present, sensitive plant and/or wildlife species utilization).

All of the aquatic habitats described above are also anticipated to qualify as waters of the state and be regulated under the Porter-Cologne Water Quality Control Act. In addition, waterways and associated riparian habitats are likely subject to regulation under Section 1600 et seq. of the California Fish and Game Code. Within the Phase 4b Project area, riparian habitat occurs in continuous bands along the Sacramento River east levee and American River north levee; scattered patches are present along the NCC waterside levee and the NEMDC.

Special-Status Plant Species

Nine special-status plant species were evaluated for their potential to occur in the NLIP, including the Phase 4b Project, area. These nine special-status plant species are covered under the NBHCP and/or are considered by the California Native Plant Society (CNPS) to be rare, endangered, or threatened and are considered to have suitable habitat in the project region. The CNDDB identifies a total of 11 special status plant species that have been identified within the USGS 7.5-minute quadrangles on which the Natomas Basin is located; however, the habitat within the Natomas Basin is not suitable for the following six of the species identified by the CNDDB because these species require alkaline soils or habitats which are not present within the NLIP area: alkali milk-vetch, brittlescale, San Joaquin spearscale, palmate-bracted bird's-beak, Heckard's pepper-grass, and stinkbells. **Table 3.7-3** summarizes for each species the regulatory or CNPS listing status, including coverage in the NBHCP; habitat association; and potential for occurrence in the Natomas Basin, including the Phase 4b Project, area.

Focused surveys were conducted by AECOM botanists in July 2009 for the Phase 4a and 4b Projects. The survey was conducted within the flowering period of rose mallow, Delta tule pea, and Sanford's arrowhead. No special-status species were found during the survey. Due to the timing of the survey, protocol-level surveys were not conducted for dwarf downingia, Bogg's Lake hedge-hyssop, and legenere. The survey followed protocol outlined in DFG's *Guidelines for Assessing the Effects of Proposed Development on Rare, Threatened, and Endangered Plants and Plant Communities* (DFG 2000).

The Triangle Properties Borrow Area, which is part of the Phase 4b Project, was not surveyed during the July 2009 effort; however, as described in Section 2.3.3.5, "Environmental Commitments for Borrow Sites," before earthmoving activities are conducted in this area, a wetland delineation, and any necessary habitat creation components and management agreements, would be completed to ensure compensation for any fill of waters of the United States.

Six of the nine species were determined to have the potential to occur in the Phase 4b Project area: dwarf downingia, Bogg's Lake hedge-hyssop, rose mallow, Delta tule pea, legenere, and Sanford's arrowhead. Rose mallow, Delta tule pea, and Sanford's arrowhead occur in freshwater habitats, including marshes, swamps, sloughs, and ditches. Potentially suitable habitat for these species is provided by irrigation and drainage canals within the Phase 4b Project area. In general, these areas provide low-quality habitat and are unlikely to support these three special-status plants. Sanford's arrowhead, rose mallow, and Delta tule pea are not known to occur in the Phase 4b Project area (CNDDB 2009).

Table 3.7-3
Special-Status Plant Species Evaluated for Potential to Occur in the Natomas Basin, Including the Phase 4b Project Footprint

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence
Dwarf downingia	*Downingia pusilla*	CNPS: 2	Vernal pools and lakes	Low potential to occur in vernal pools along existing waterside levee toe of NEMDC South, landside levee toe of the NEMDC, and Triangle Properties Borrow Area; no suitable habitat present in vernal pools along the landside NEMDC
Bogg's Lake hedge-hyssop	*Gratiola heterosepala*	CA: endangered CNPS: 1B NBHCP: covered	Vernal pools and lake margins	Low potential to occur in vernal pools along existiug waterside levee toe of NEMDC South, landside levee toe of the NEMDC, and Triangle Properties Borrow Area; no suitable habitat present in vernal pools along the landside NEMDC
Rose mallow	*Hibiscus lasiocarpus*	CNPS: 2	Freshwater marshes and swamps	Low potential to occur in ditches and ponds
Delta tule pea	*Lathyrus jepsonii jepsonii*	CNPS: 1B NBHCP: covered	Freshwater and brackish marshes and sloughs	Low potential to occur in ditches and ponds
Legenere	*Legenere limosa*	CNPS: 1B NBHCP: covered	Vernal pools	Low potential to occur in vernal pools along existing waterside levee toe of NEMDC South, landside levee toe of the NEMDC, and Triangle Properties Borrow Area; no suitable habitat present in vernal pools along the landside NEMDC
Colusa grass	*Neostapfia colusana*	Federal: threatened CA: endaugered CNPS: 1B NBHCP: covered	Deep vernal pools	No suitable habitat is present
Slender Orcutt grass	*Orcuttia tenuis*	Federal: threatened CA: endangered CNPS: 1B NBHCP: covered	Deep vernal pools	No suitable habitat is present
Sacramento Orcutt grass	*Orcuttia viscida*	Federal: endangered CA: endangered CNPS: 1B NBHCP: covered	Deep vernal pools	No suitable habitat is present
Sanford's arrowhead	*Sagittaria sanfordii*	CNPS: 1B NBHCP: covered	Freshwater ponds, marshes and ditches	Low potential to occur in ditches and ponds

Notes: CA = California; CNPS = California Native Plant Society; NBHCP = Natomas Basin Habitat Conservation Plan; NEMDC = Natomas East Main Drainage Canal

California Native Plant Society Listing Categories:

1B Plants considered rare, threatened, or endangered in California and elsewhere

2 Plants considered rare, threatened, or endangered in California but more common elsewhere

Source: CNPS 2009; CNDDB 2009; City of Sacramento, Sutter County, and TNBC 2003; USFWS 2005; Data compiled by AECOM in 2009

A number of special-status plants known to occur in the vicinity of the Phase 4b Project area are restricted to vernal pool habitat. Vernal pools are present along the waterside toe of the NEMDC South west levee, along the landside of the NEMDC, in the Triangle Properties Borrow Area, and along Lower Dry Creek. Documented occurrences of dwarf downingia are known along the landside of the NEMDC (CNDDB 2009). However, the vernal pools within the Phase 4b Project area provide low-quality habitat as evidenced by a high percentage of nonnative plant species and abundance of nonnative annual grasses, which decrease the wet phase of the vernal pools; therefore, the vernal pools within the Phase 4b Project area are unlikely to support these three special-status plants due to high levels of disturbance. The remaining three species included in **Table 3.7-3**, Colusa grass, slender Orcutt grass, and Sacramento Orcutt grass, are not addressed further in this section because the Phase 4b Project area does not support the deep vernal pools that they require.

Special-Status Wildlife Species

A programmatic Biological Opinion (BO) was issued by USFWS for the NLIP in October 2008; amended BOs were issued in May 2009, September 2009, May 2010, and October 2010 for project-level elements of the NLIP (**Appendix D1**).

All special status species that have documented occurrences within the CNDDB, or appropriate habitat within the Natomas Basin were evaluated for potential to occur. Twenty special-status wildlife species, including all species covered by the NBHCP, were evaluated for their potential to occur in the Natomas Basin, including the Phase 4b Project, area. **Table 3.7-4** summarizes for each species the regulatory status, including coverage in the NBHCP; habitat association; and potential for occurrence in the Phase 4b Project area. Two amphibian species are not addressed further in this section because the Phase 4b Project area does not support the habitats in which they occur. Three of the bird species listed in **Table 3.7-4** have been documented in the area in the past but are not known to nest in the Phase 4b Project area and are not discussed further. The remaining eleven species were determined to have potential to occur in the Phase 4b Project area during at least part of the year and are discussed below.

Table 3.7-4
Special-Status Wildlife Species Evaluated for Potential to Occur in the Natomas Basin, Including the Phase 4b Project Footprint

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence
Invertebrates				
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Federal: threatened NBHCP: covered	Elderberry shrubs, typically in riparian habitats	Known to occur along the American River north levee; elderberry shrubs are present within and adjacent to the Sacramento River east levee and the American River north levee
California linderiella	*Linderiella occidentalis*	NBHCP: covered	Vernal pools and other seasonal wetlands	Known occurrence along the NEMDC; potential to occur in Triangle Properties Borrow Area and Lower Dry Creek woodland mitigation area
Vernal pool tadpole shrimp	*Lepidurus packardi*	Federal: endangered NBHCP: covered	Vernal pools and swales	Known occurrence along the NEMDC and in vicinity of Triangle Properties Borrow Area; could occur in Lower Dry Creek woodland mitigation area
Midvalley fairy shrimp	*Branchinecta mesovallensis*	NBHCP: covered	Vernal pools	Not likely to occur

Table 3.7-4
Special-Status Wildlife Species Evaluated for Potential to Occur in the Natomas Basin, Including the Phase 4b Project Footprint

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence
Vernal pool fairy shrimp	*Branchinecta lynchi*	Federal: threatened NBHCP: covered	Vernal pools and other seasonal wetlands	Known occurrence along the NEMDC; potential to occur in Triangle Properties Borrow Area and Lower Dry Creek woodland mitigation area
Amphibians				
California tiger salamander	*Ambystoma californiense*	Federal: threatened CA: species of special concern NBHCP: covered	Vernal pools and seasonal wetlands in upland with burrows and other belowground refuge	No suitable habitat is present
Western spadefoot	*Spea hammondii*	CA: species of special concern NBHCP: covered	Vernal pools and seasonal wetlands in upland with burrows and other belowground refuge	No suitable habitat is present
Reptiles				
Giant garter snake	*Thamnophis gigas*	Federal: threatened CA: threatened NBHCP: covered	Streams, sloughs, ponds, and irrigation/ drainage ditches; also require upland refugia not subject to flooding during the snake's inactive season	Known to occur; the Natomas Basin supports a key population; rice fields, ditches, and ponds
Northwestern pond turtle	*Actinemys marmorata marmorata*	CA: species of special concern NBHCP: covered	Ponds, marshes, rivers, streams, sloughs; nest in nearby uplands with suitable soils	Known to occur in ditches and ponds
Birds				
White-faced ibis	*Plegadis chihi*	CA: species of special concern NBHCP: covered	Forage and roost in shallow water and flooded fields; nest in freshwater marshes	Rice fields provide foraging habitat; the only nesting colony in the Natomas Basin is approximately 3 miles from the nearest levee improvement area
Aleutian Canada goose	*Branta canadensis leucopareia*	NBHCP: covered	Forage in agricultural fields and roost in aquatic habitats	Could be a winter visitor, but no recent documented occurrences
White-tailed kite	*Elanus leucurus*	CA: fully protected	Forage in grasslands and agricultural fields; nest in isolated trees or small woodland patches	Known to nest and forage in the area
Northern harrier	*Circus cyaneus*	CA: species of special concern	Forage and nest in grassland, agricultural fields, and marshes	Known to nest and forage in the area
Cooper's hawk	*Accipiter cooperii*	CA: species of special concern	Forage and nest in open woodlands and woodland margins	Known to nest and forage in the area
Swainson's hawk	*Buteo swainsoni*	CA: threatened NBHCP: covered	Forage in grasslands and agricultural fields; nest in open woodland or scattered trees	Known to nest and forage in the area

Table 3.7-4
Special-Status Wildlife Species Evaluated for Potential to Occur in the Natomas Basin, Including the Phase 4b Project Footprint

Common Name	Scientific Name	Status	Habitat	Potential for Occurrence
American peregrine falcon	*Falco peregrinus anatum*	CA: endangered and fully protected NBHCP: covered	Forage in a variety of open habitats, particularly marshes and other wetlands	Likely to occasionally forage in the area, but no suitable nesting habitat is present
Burrowing owl	*Athene cunicularia*	CA: species of special concern NBHCP: covered	Grasslands and agricultural fields	Known to nest and forage in the area
Bank swallow	*Riparia riparia*	CA: threatened NBHCP: covered	Forage in various habitats; nest in banks or bluffs, typically adjacent to water	Could forage in the area, but no colonies have been documented nearby within the past 10 years
Loggerhead shrike	*Lanius ludovidianus*	CA: species of special concern NBHCP: covered	Forage in grasslands and agricultural fields; nest in scattered shrubs and trees	Known to nest and forage in the area
Tricolored blackbird	*Agelaius tricolor*	CA: species of special concern NBHCP: covered	Forage in grasslands and agricultural fields; nest in freshwater marsh, riparian scrub, and other dense shrubs and herbs	Known to nest and forage in the area

Notes: CA = California; NBHCP = Natomas Basin Habitat Conservation Plan; NEMDC = Natomas East Main Drainage Canal
Source: CNDDB 2009; City of Sacramento, Sutter County, and TNBC 2003; USFWS, 2005, 2006; Data compiled by AECOM in 2009

- **Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp**. The vernal pool tadpole shrimp is Federally listed as endangered and the vernal pool fairy shrimp is Federally listed as threatened; both are covered under the NBHCP. Vernal pool tadpole shrimp and vernal pool fairy shrimp occur in vernal pool habitats. Scattered vernal pool habitat is present along the NEMDC, on the Triangle Properties Borrow Area, and the Lower Dry Creek woodland mitigation planting area. Documented occurrences of vernal pool fairy shrimp and vernal pool tadpole shrimp are located along the landside of the NEMDC along Natomas Road, south of Sankey Road.

  While no longer a DFG species of concern, California linderiella and midvalley fairy shrimp are covered by the NBHCP. California linderiella is known to occur within the Phase 4b Project area; occurrences of California linderiella are known from south of Elverta Road to north of Del Paso Road along the NEMDC west levee (CNDDB 2009). Midvalley fairy shrimp are not likely to occur within the Phase 4b Project area; the nearest documented occurrence is approximately 10 miles south of the Natomas Basin. Except for within the Phase 4b Project footprint, there are no other occurrences of these species within the Basin.

- **Valley Elderberry Longhorn Beetle**. The valley elderberry longhorn beetle is Federally listed as threatened and is covered under the NBHCP. These beetles are patchily distributed throughout the remaining riparian forests of the Central Valley, from Redding to Bakersfield, and appear to be only locally common (i.e., found in population clusters that are not evenly distributed across the Central Valley). Valley elderberry longhorn beetles require elderberry shrubs (*Sambucus* sp.) for reproduction and survival, and are rarely seen because they spend most of their life cycle as larvae within the stems of the shrubs. It appears that in order to function as habitat for the valley elderberry longhorn beetle, host elderberry shrubs must have stems that are 1.0 inch or greater in diameter at ground level. Use of the shrubs by the beetle is rarely apparent; often the only exterior evidence is an exit hole created by the larva just before the pupal stage.

  USFWS released a 5-year status review for the valley elderberry longhorn beetle on October 2, 2006 (USFWS 2006). This review reported an increase in known beetle locations from 10 at the time of listing in 1980 to

190 in 2006. Because of the presumed increase in the estimated population and the concurrent protection and restoration of several thousand acres of riparian habitat suitable for valley elderberry longhorn beetles, 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 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. If valley elderberry longhorn beetles are removed from the ESA list, it will likely be more than a year before this decision is finalized.

Documented occurrences of valley elderberry longhorn beetle are present along the waterside of the American River north levee and on the west bank of the Sacramento River (CNBBD 2009). Elderberry shrubs that could support beetles are relatively scattered throughout the Phase 4b Project area, primarily in riparian vegetation on the waterside of the Natomas Basin perimeter levee system. Elderberry shrubs are also scattered in some remnant riparian and oak woodland clumps on the landside of the levee, but they are relatively uncommon in these locations.

- **Giant Garter Snake**. The giant garter snake is Federally and state-listed as threatened and is a primary covered species under the NBHCP. This species formerly ranged throughout the wetlands of California's Central Valley but appears to have been extirpated from the southern San Joaquin Valley (Hansen and Brode 1980, USFWS 1999) and has suffered serious declines in other parts of its former range. The primary cause of decline, loss or degradation of aquatic habitat caused by agricultural development, has been compounded by the loss of upland refugia and bankside vegetation cover (Thelander 1994).

  Giant garter snakes inhabit agricultural wetlands and other waterways, such as irrigation and drainage canals, rice fields, marshes, sloughs, ponds, small lakes, low-gradient streams, and adjacent uplands in the Central Valley (USFWS 1999). **Table 3.7-1** lists the overall acreages of habitat types in the Natomas Basin; ditches and canals are included in the "open water" designation. Rice fields and their adjacent irrigation and drainage canals serve an important role as aquatic habitat for giant garter snake. During summer, giant garter snakes use the flooded rice fields as long as their prey is present in sufficient densities. In late summer, rice fields provide important nursery areas for newborns. In late summer/fall, water is drained from the rice fields and giant garter snake prey items become concentrated in the remaining pockets of standing water, which allow the snakes to gorge before their period of winter inactivity (USFWS 1999). It appears that the majority of giant garter snakes move back into the canals and ditches as the rice fields are drained, although a few may overwinter in the fallow fields, where they hibernate within burrows in the small berms separating the rice checks (Hansen 1998).

  Managed marsh in TNBC reserves also provides important habitat for giant garter snake. In contrast to rice, managed marsh provides year-round habitat, and habitat elements to meet all of the giant garter snake's daily and seasonal needs, such as dense cover, basking sites, and refugia. TNBC reserves have been designed to provide habitat elements throughout the marsh; by contrast, the limited availability of the same elements in rice fields contributes to giant garter snake use occurring primarily around the perimeter of the rice fields. Total acres of created marsh habitat present in the Natomas Basin, are shown in **Table 3.7-1**.

  The width of uplands used by giant garter snake varies considerably. Many summer basking and refuge areas used by this snake are immediately adjacent to canals and other aquatic habitats, and may even be located in the upper canal banks. Giant garter snakes have also been found hibernating as far as 820 feet from water, however, and any land within this distance may be important for snake survival in some cases (Hansen 1988). USFWS considers 200 feet to be the width of upland vegetation needed to provide adequate habitat for giant garter snake along the borders of aquatic habitat (USFWS 1997).

  The Natomas Basin supports one of the most significant of the remaining giant garter snake populations in California. Recent occurrences of the species have generally been concentrated in the central and northern portions of the Basin, with giant garter snakes becoming increasingly uncommon at Fisherman's Lake in the

south (TNBC 2008). There are a number of likely causes for this disparity, including limited opportunities for exchange of individuals between key populations in the northern concentration of TNBC reserves and the population at Fisherman's Lake in the south (TNBC 2008). Despite this, habitat provided by Fisherman's Lake and associated TNBC preserve tracts supports one of the three major population clusters in the Natomas Basin. Irrigation and drainage ditches and canals throughout the Phase 4b Project area provide habitat of varying quality for giant garter snake, depending on the location. Large waterways, such as the Sacramento and American Rivers, do not provide suitable habitat for giant garter snake.

- **Northwestern Pond Turtle**. Northwestern pond turtle is a DFG species of special concern and is covered under the NBHCP. This species is generally associated with permanent or near-permanent aquatic habitats, such as lakes, ponds, streams, freshwater marshes, and agricultural ditches. They require still or slow-moving water with instream emergent woody debris, rocks, or similar features for basking sites. Pond turtles are highly aquatic but can venture far from water for egg laying. Nests are typically located on unshaded upland slopes in dry substrates with clay or silt soils (Jennings and Hayes 1994).

  Ditches, ponds, and marshes throughout the Natomas Basin provide potential habitat for northwestern pond turtle. Basinwide acreages of these habitats are shown in **Table 3.7-1** in the categories "Open water" and "Fresh emergent marsh." Potential breeding habitat is very limited because of the predominance of agriculture and development, but turtles could occur along ditches and margins of other aquatic habitat. Limited information is available on the status and distribution of the northwestern pond turtle in the Basin. Surveys conducted in 2004–2007 for TNBC documented only 17 occurrences of northwestern pond turtle in the Natomas Basin; nearly half of these were in the Fisherman's Lake area (TNBC 2008).

- **Swainson's Hawk**. Swainson's hawk is state listed as threatened and is a primary covered species under the NBHCP. As many as 17,000 Swainson's hawk pairs may have nested in California at one time (DFG 1994). Currently, there are 700–1,000 breeding pairs in California, of which 600–900 are in the Central Valley (Estep 2003). Swainson's hawks typically occur in California only during the breeding season (March–September) and winter in Mexico and South America. The Central Valley population migrates only as far south as central Mexico. Swainson's hawks begin to arrive in the Central Valley in March; nesting territories are usually established by April, with incubation and rearing of young occurring through June (Estep 2003).

  Swainson's hawks are found most commonly in grasslands, low shrublands, and agricultural habitats that include large trees for nesting. Nests are found in riparian woodlands, roadside trees, trees along field borders, and isolated trees. Corridors of remnant riparian forest along drainages contain the majority of known nests in the Central Valley (England, Bechard, and Houston 1997; Estep 1984; Schlorff and Bloom 1984). Nesting pairs frequently return to the same nest site for multiple years and decades.

  Prey abundance and accessibility are the most important features determining the suitability of Swainson's hawk foraging habitat. In addition, agricultural operations (e.g., mowing, flood irrigation) have a substantial influence on the accessibility of prey and thus create important foraging opportunities for Swainson's hawk. Crops that are tall and dense enough to preclude the capture of prey do not provide suitable habitat except around field margins, but prey animals in these habitats are accessible during and soon after harvest. Swainson's hawks feed primarily on small rodents but also consume insects and birds. Although the most important foraging habitat for Swainson's hawks lies within a 1-mile radius of each nest (City of Sacramento, Sutter County, and TNBC 2003), Swainson's hawks have been recorded foraging up to 18.6 miles from nest sites (Estep 1989). Any habitat within the foraging distance may provide food at some time in the breeding season that is necessary for reproductive success. In a dynamic agricultural environment such as the Natomas Basin, the area required for Swainson's hawk foraging habitat depends on time of season, crop cycle, crop type, and disking/harvesting schedule, as these factors affect the abundance and availability of prey (City of Sacramento, Sutter County, and TNBC 2003).

The most recent survey published by TNBC (2008) documented that 44 of the 103 known nesting territories in the Natomas Basin and along adjacent waterways were active in 2007. Most nest sites are located in the western portion of the Basin along the Sacramento River. Along the Sacramento River, the majority of nest sites are located on the waterside of the levees, and the relatively few nest sites on the landside of the Sacramento River east levee are typically located at least several hundred feet or more from the levee. In addition to the scattered nest sites adjacent to the Phase 4b Project area, agricultural fields and levee maintenance zones throughout the Phase 4b Project area provide suitable foraging habitat for Swainson's hawk. Basinwide acreages of grasslands and alfalfa, row, and grain crops that may provide foraging habitat for Swainson's hawks are shown in **Table 3.7-1**.

The Phase 4b Project area is within a densely populated and important component of the Central Valley Swainson's hawk population. Nesting pairs in the Natomas Basin may represent as much as 10% of the Swainson's hawks that are found in the Central Valley. Most nest sites are located in the western portion of the Basin along the Sacramento River; nest sites are also known to occur in trees in the vicinity of the Fisherman's Lake area. Nesting habitat includes riparian and non-riparian woodlands. In addition to nest sites that are adjacent to the Phase 4b Project area, there are agricultural fields and grassland habitats (including levee and canal maintenance zones) throughout the Phase 4b Project area that provide suitable foraging habitat for Swainson's hawk.

Alfalfa and other irrigated field crops can generally provide higher-quality foraging habitat than uncultivated annual grasslands and ruderal areas due to prey abundance and availability. The crops can provide abundant cover and food for prey populations. Periodic disturbances such as harvesting, tilling, and flooding can increase prey availability. Certain crops provide better foraging than others due to crop height and the frequency of the disturbance regime. Generally, alfalfa crops are considered the highest value foraging habitat for Swainson's hawk. Next in order of preference is grass hay, fallow crops, row and grain crops, and finally annual grasslands (Estep 2007, Woodbridge 1998).

- **Burrowing Owl**. Burrowing owl is a DFG species of special concern and is covered under the NBHCP. Burrowing owls and their nests are also protected under Section 3503.5 of the California Fish and Game Code, which states that it is unlawful to take, possess, or destroy any raptors, including their nests or eggs. Burrowing owls typically inhabit grasslands and other open habitats with low-lying vegetation. They are also known to nest and forage in idle agricultural fields, ruderal fields, and the edges of cultivated fields, although these areas provide lower-quality habitat than native grasslands. Burrow availability is an essential component of suitable habitat. Burrowing owls are capable of digging their own burrows in areas with soft soil, but they generally prefer to adopt those excavated by other animals, typically ground squirrels. In areas where burrows are scarce, they can use pipes, culverts, debris piles, and other artificial features.

  Burrowing owl sightings are generally in the eastern half of the Natomas Basin, with the highest concentration along the far eastern edge (TNBC 2008). Potentially suitable burrowing owl burrows and foraging habitat occurs within the Phase 4b Project area along the NEMDC.

- **Northern Harrier**. Northern harrier is a California Species of Special Concern and a year-round resident in California. This species is not covered under the NBHCP. Northern harriers are likely to nest in grain crops and fallow agricultural fields in and adjacent to the Phase 4b Project area.

- **Other Nesting Birds**. Several bird species identified in **Table 3.7-4** have the potential to nest in or adjacent to the Phase 4b Project area. Species associated with riparian and other woodland habitats, such as Cooper's hawk and white-tailed kite, are most likely to nest along the Sacramento River, American River, NEMDC South (Cooper's hawk), and in remnant woodland and suitable trees on the landside of the levees (white-tailed kite). In general, these two raptor species are relatively uncommon in the Phase 4b Project area. Loggerhead shrikes are known to nest at several TNBC reserves and elsewhere in the Natomas Basin (TNBC

2008) and are likely to nest in small trees and shrubs within the Phase 4b Project area, particularly on the landside of the Sacramento River east levee and along Fisherman's Lake.

Tricolored blackbirds have been known to nest on a preserve in TNBC's Central Basin Reserve Area and in the extreme northeast corner of the Basin (TNBC 2008). There is also potential for this species to nest in areas of suitable habitat elsewhere adjacent to the Phase 4b Project area, including several TNBC reserves. White-faced ibis were not known to nest anywhere in the Natomas Basin until 2007, when a new nesting colony became established at a preserve in TNBC's Central Basin Reserve. Although foraging tricolored blackbird and white-faced ibis have been observed in the Fisherman's Lake area, occurrences of these species are uncommon in the southern portion of the Natomas Basin and no known nesting sites occur near the Phase 4b Project area.

Special-Status Fish

Seven special-status fish species have the potential to occur in the lower Sacramento River, NEMDC, and/or NCC as described below (**Table 3.7-5**). Of the seven species, Central Valley steelhead distinct population segment (DPS; formerly Evolutionarily Significant Unit [ESU]), Sacramento River winter-run Chinook salmon ESU, Central Valley spring-run Chinook salmon ESU, and the Southern DPS of North American green sturgeon are Federally listed as endangered or threatened species. Sacramento River winter-run Chinook salmon ESU (endangered) and Central Valley spring-run Chinook salmon ESU (threatened) are also listed under CESA. The National Marine Fisheries Service (NMFS) determined that listing is not warranted for Central Valley fall-/late fall-run Chinook salmon. However, this species is still designated a species of concern by NMFS and a species of special concern by DFG because of concerns about specific risk factors. The remaining two species, hardhead and Sacramento splittail, are considered species of special concern by DFG. Delta smelt, which is Federally and state-listed as threatened, and longfin smelt, which was recently state listed as threatened, are found in the tidally influenced reaches of the Sacramento River downstream of the confluence with the American River, and therefore are not expected to be found in the Sacramento River near the Phase 4b Project area, in the NEMDC, or in the NCC. Summary descriptions for those species that have the potential to occur in the Natomas Basin, including the Phase 4b Project, area are provided below.

- **Fall-/Late Fall-Run Chinook Salmon ESU**. Adult fall-/late fall-run Chinook salmon enter the Sacramento and San Joaquin River systems from July through April and spawn from October through February. During spawning, the female digs a redd (gravel nest) in which she deposits her eggs, which are then fertilized by the male. Optimal water temperatures for egg incubation are 6.7 degrees Celsius (°C) to 12.2°C. Newly emerged fry remain in shallow, lower-velocity edgewaters, particularly where debris congregates and makes the fish less visible to predators (DFG 1998). The duration of egg incubation and time of fry emergence depends largely on water temperature. In general, eggs hatch after a 3- to 5-month incubation period, and alevins (yolk-sac fry) remain in the gravel until their yolk-sacs are absorbed (2–3 weeks).

  Cover structures, space, and food are necessary components for Chinook salmon rearing habitat. Suitable habitat includes areas with instream and overhead cover in the form of undercut banks; downed trees; and large, overhanging tree branches. The organic materials forming fish cover also help provide sources of food, in the form of both aquatic and terrestrial insects. Growth of juvenile Chinook salmon in floodplain habitat is fast relative to growth in river habitat. Juvenile salmon have been found to have growth rates in excess of 1 millimeter (mm) per day when they rear in flooded habitat and as much as 20 mm in 2–3 weeks (Jones & Stokes 2001). The water temperature in floodplain habitat is typically higher than that in main channel habitats. Although increased temperature increases metabolic requirements, the productivity in flooded habitat is also increased, resulting in higher growth rates (Sommer et al. 2001). The production of drift invertebrates in the Yolo Bypass

Table 3.7-5
Special-Status Fish Species Potentially Occurring in the Natomas Basin, Including the Phase 4b Project Area: Lower Sacramento River, Natomas East Main Drainage Canal, and/or Natomas Cross Canal

Species	Status[1]		Habitat	Potential to Occur
	USFWS/ NMFS	DFG		
Central Valley fall-/late fall–run Chinook salmon ESU *Oncorhynchus tshawytscha*	SC	SSC	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries, and in the Delta	Occurs in the lower Sacramento River, and NEMDC; could occur in the NCC
Sacramento River winter-run Chinook salmon ESU *Oncorhynchus tshawytscha*	E	E	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries, and in the Delta	Occurs in the Sacramento River; while unlikely, juveniles could stray into the NCC
Central Valley spring-run Chinook salmon ESU *Oncorhynchus tshawytscha*	T	T	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries, and in the Delta	Occurs in the Sacramento River and certain tributaries; while unlikely, adults and juveniles could stray into the NCC
Central Valley steelhead DPS *Oncorhynchus mykiss*	T	–	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, and tributaries, and in the Delta	Occurs in the lower Sacramento River, and NEMDC; could also occur in the NCC
North American Green sturgeon Southern DPS *Acipenser medirostris*	T	–	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, tributaries, and Delta	Occurs in the lower Sacramento River; unlikely to stray into the NCC
Sacramento splittail *Pogonichthys macrolepidotus*	–	SSC	Spawning and juvenile rearing from winter to early summer in shallow weedy areas inundated during seasonal flooding in the lower reaches and flood bypasses of the Sacramento River, including the Yolo Bypass	Occurs in the lower Sacramento River; may also occur in the NCC
Hardhead *Mylopharodon conocephalus*	SC	SSC	Spawning occurs in pools and side pools of rivers and creeks; juveniles rear in pools of rivers and creeks, and in shallow to deeper water of lakes and reservoirs	Occurs in the lower Sacramento River and NEMDC; could also occur in the NCC

Notes: Delta = Sacramento–San Joaquin Delta; DFG = California Department of Fish and Game; ESU = Evolutionarily Significant Unit; DPS = Distinct Population Segment; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service

[1] Legal Status Definitions

Federal Listing Categories (USFWS and NMFS)
- E Endangered (legally protected)
- T Threatened (legally protected)
- SC Species of Concern

State Listing Categories (DFG)
- E Endangered (legally protected)
- T Threatened (legally protected)
- SSC Species of Special Concern (no formal protection)

Source: Data compiled by AECOM in 2009

has been found to be one to two times greater than production in the river (Sommer et al. 2001). Also, grasses that are flooded support invertebrates that are also a substantial source of food for rearing juveniles. Increased areas resulting from flooded habitat can also reduce the competition for food and space and potentially decrease the possible encounters with predators (Sommer et al. 2001). Juvenile Chinook salmon that grow faster are likely to migrate downstream sooner, which helps to reduce the risks of predation and competition in freshwater systems.

Juvenile Chinook salmon in the Sacramento River system move out of upstream spawning areas into downstream habitats in response to many factors, including inherited behavior, habitat availability, flow, competition for space and food, and water temperature. The number of juveniles that move and the timing of movement are highly variable. Storm events and the resulting high flows appear to trigger movement of substantial numbers of juvenile Chinook salmon to downstream habitats. In general, juvenile abundance in the Delta increases as flow increases (USFWS 1993a).

Fall-/late fall-run Chinook salmon emigrate as fry and subyearlings and remain off the California coast during their ocean migration (63 *Federal Register* [FR] 11481, March 9, 1998). Fall-/late fall-run Chinook salmon occur in the lower Sacramento River and NEMDC, and could also occur in the NCC.

- **Winter-Run Chinook Salmon ESU**. Adult winter-run Chinook salmon leave the ocean and migrate through the Delta into the Sacramento River system from November through July. These salmon migrate upstream past the Red Bluff Diversion Dam (RBDD) on the Sacramento River from mid-December through July, and most of the spawning population has passed RBDD by late June. Winter-run Chinook salmon spawn from mid-April through August, and incubation continues through October. The primary spawning grounds in the Sacramento River are above RBDD. Adult winter-run Chinook salmon generally do not enter the American River.

  Juvenile winter-run Chinook salmon rear and emigrate in the Sacramento River from July through March (Hallock and Fisher 1985). Juveniles descending the Sacramento River above RBDD from August through October and possibly November are mostly pre-smolts (smolts are juveniles that are physiologically ready to enter seawater) and probably rear in the Sacramento River below RBDD. Juveniles have been observed in the Delta between October and December, especially during high Sacramento River discharge caused by fall and early-winter storms.

  Triggers for downstream movement are similar to those described above for fall-run Chinook salmon. Winter-run salmon smolts may migrate through the Delta and bay to the ocean from December through as late as June (Stevens 1989 cited in USFWS 1993b). The Sacramento River channel is the main migration route through the Delta. Adult winter-run Chinook salmon spend 1–4 years in the ocean. Winter-run Chinook salmon occur in the lower Sacramento River adjacent to the Natomas Basin, including the Phase 4b Project, area.

- **Spring-Run Chinook Salmon ESU**. Spring-run Chinook salmon historically were the second most abundant run of Central Valley Chinook salmon (Fisher 1994). They occupied the headwaters of all major river systems in the Central Valley where there were no natural barriers. Adults returning to spawn ascended the tributaries to the upper Sacramento River, including the Pit, McCloud, and Little Sacramento Rivers. They also occupied Cottonwood, Battle, Antelope, Mill, Deer, Stony, Big Chico, and Butte Creeks and the Feather, Yuba, American, Mokelumne, Stanislaus, Tuolumne, Merced, San Joaquin, and Kings Rivers. Spring-run Chinook salmon migrated farther into headwater streams where cool, well-oxygenated water is available year round.

  Surveys indicate that remnant, nonsustaining spring-run Chinook salmon populations may be found in Cottonwood, Battle, Antelope, and Big Chico Creeks (DWR 1997). More sizable, consistent runs of naturally produced fish are found only in Mill and Deer Creeks. The Feather River Fish Hatchery sustains the spring-run population on the Feather River, but the genetic integrity of that run is questionable (DWR 1997). Estimates since 1953 on the Feather River indicate that numbers returning to the hatchery average around 2,115, although the estimates have increased dramatically since 1990 (DFG 2006).

Historical records indicate that adult spring-run Chinook salmon enter the mainstem Sacramento River in February and March and continue to their spawning streams, where they then hold in deep, cold pools until they spawn. Spring-run Chinook salmon are sexually immature during their spawning migration. Some adult spring-run Chinook salmon start arriving in the Feather River below the Fish Barrier Dam in June. They remain there until the fish ladder is opened in early September. Spawning and rearing requirements for the species are similar to those identified above for fall-run Chinook salmon.

Spawning occurs in gravel beds from late August through October, and emergence takes place in March and April. Spring-run Chinook salmon appear to emigrate at two different life stages: fry and yearlings. Fry move between February and June, while the yearling spring-run emigrate October to March, peaking in November (Cramer and Demko 1997).

Juveniles display considerable variation in stream residence and migratory behavior. Juvenile spring-run Chinook salmon may leave their natal streams as fry soon after emergence or rear for several months to a year before migrating as smolts or yearlings (Yoshiyama et al. 1998). Triggers for downstream movement are similar to those described above for fall-run Chinook salmon.

On March 9, 1998 (63 FR 11481), NMFS issued a proposed rule to list Central Valley spring-run Chinook salmon ESU as endangered; however, it designated the species as threatened on September 16, 1999 (64 FR 50393). On February 5, 1999, the California Fish and Game Commission listed it as threatened under CESA. Critical habitat originally had been designated for Central Valley spring-run Chinook salmon by NMFS (65 FR 7764, February 16, 2000). However, following a lawsuit (*National Association of Home Builders et al. v. Donald L. Evans, Secretary of Commerce, et al.*), NMFS rescinded the listing. After further review, critical habitat for the Central Valley spring-run Chinook salmon ESU was designated on August 12, 2005. Critical habitat is designated to include select waters in the Sacramento and San Joaquin River basins. Spring-run Chinook salmon occur in the lower Sacramento River adjacent to the Natomas Basin, including the Phase 4b Project area.

- **Central Valley Steelhead DPS**. Historically, steelhead spawned and reared in most of the accessible upstream reaches of Central Valley rivers, including the Sacramento and American Rivers and many of their tributaries. Compared with Chinook salmon, steelhead generally migrated farther into tributaries and headwater streams where cool, well-oxygenated water is available year-round. In the Central Valley, steelhead are now restricted to the upper Sacramento River downstream of Keswick Reservoir; the lower reaches of large tributaries downstream of impassable dams; small, perennial tributaries of the Sacramento River mainstem; and the San Francisco Bay/Sacramento–San Joaquin Delta (Bay-Delta) system.

  The upstream migration of adult steelhead in the mainstem Sacramento River historically started in July, peaked in September, and continued through February or March. Central Valley steelhead spawn mainly from January through March, but spawning has been reported from late December through April (McEwan and Jackson 1996). During spawning, the female digs a redd (gravel nest) in which she deposits her eggs, which are then fertilized by the male. Egg incubation time in the gravel is determined by water temperature, varying from approximately 19 days at an average water temperature of 15.5°C to approximately 80 days at an average temperature of 14.5°C (McEwan and Jackson 1996).

  Steelhead fry usually emerge from the gravel 2–8 weeks after hatching, between February and May, sometimes extending into June (Barnhart 1986, Reynolds et al. 1993). Newly emerged steelhead fry move to shallow, protected areas along streambanks but move to faster, deeper areas of the river as they grow. Juvenile steelhead feed on a variety of aquatic and terrestrial insects and other small invertebrates.

  Juvenile steelhead rear throughout the year and may spend 1–3 years in freshwater before emigrating to the ocean. Smoltification, the physiological adaptation that juvenile salmonids undergo to tolerate saline waters, occurs in juveniles as they begin their downstream migration. Smolting steelhead generally emigrate from March to June (Barnhart 1986, Reynolds et al. 1993).

NMFS completed a status review of steelhead populations in Washington, Oregon, Idaho, and California and identified 15 DPSs in this range. On August 9, 1996, NMFS issued a proposed rule to list five of these DPSs (including the Central Valley steelhead) as endangered and five as threatened under the ESA (61 FR 155). The Central Valley steelhead DPS was later listed as threatened (downgraded from its proposed status of endangered) (63 FR 13347, March 19, 1998), and critical habitat (which included the lower Feather and Yuba Rivers) was designated for this DPS (65 FR 7764, February 16, 2000). However, after the lawsuit referenced above (*National Association of Home Builders et al. v. Donald L. Evans, Secretary of Commerce, et al.*), NMFS rescinded the listing. After further review, critical habitat for the Central Valley steelhead DPS was designated on August 12, 2005. This habitat includes select waters in the Sacramento and San Joaquin River basins. Steelhead occur in the lower Sacramento River and NEMDC, and could occur in the NCC.

- **North American Green Sturgeon Southern DPS**. On April 7, 2006 NMFS listed the Southern DPS of the North American green sturgeon as threatened under the ESA (71 FR 17757). The Southern DPS includes individual reproductive populations south of the Eel River. The populations north of the Eel River, grouped as the Northern DPS, currently do not warrant listing. Green sturgeon are found in the lower reaches of large rivers, including the Sacramento–San Joaquin River basin, and in the Eel, Mad, Klamath, and Smith Rivers. Green sturgeon adults and juveniles are found throughout the upper Sacramento River, as indicated by observations incidental to winter-run Chinook monitoring at RBDD in Tehama County (NMFS 2005). Green sturgeon spawn predominantly in the upper Sacramento River and are found primarily in the mainstem Sacramento River.

  The green sturgeon is a primitive, bottom-dwelling fish found from Ensenada, Mexico, to the Bering Sea and Japan (Wang 1986). It is characterized by its large size (up to 7 feet long and 350 pounds), a long, round body, and "scutes," or plates along dorsal and lateral sides. It is known to migrate up to 600 miles between freshwater and saltwater environments and is commercially caught in the Columbia River and coastal Washington (Pacific States Marine Fisheries Commission [PSMFC] 1996). Very little is known about the life history of the green sturgeon relative to other fish species. It is an anadromous fish that spends most of its life in salt water and returns to spawn in freshwater. It is slow growing and late maturing and may spawn as little as every 4–11 years. Individuals congregate in the bays of these systems in summer, while some may travel upstream to spawn in spring and summer.

  Spawning occurs in the lower reaches of large rivers with swift currents and large cobble. In the Sacramento River, they spawn in the upper river and are thought to spawn every 3–5 years (Tracy 1990). Their spawning period is March to July, with a peak in mid-April to mid-June (Moyle et al. 1992). Adults broadcast spawn in the water column and fertilized eggs sink and attach to bottom substrate until they hatch (PSMFC 1996). Flow has been identified as the key determinant to larval survival; therefore, water diversions and low dam releases may negatively impact green sturgeon survival rates (PSMFC 1996). Juveniles feed on algae and small invertebrates and migrate downstream before they enter their third year of life. Juveniles inhabit the estuary until they are approximately 4–6 years old, when they migrate to the ocean to feed on benthic invertebrates and fish (Kohlhorst et al. 1991).

  NMFS proposed critical habitat for the Southern DPS of North American green sturgeon on September 8, 2008 and extended the comment period until December 22, 2008. On October 9, 2009, NMFS issued its final rule on critical habitat, which includes the lower Sacramento River adjacent to the Sacramento River east levee. North American green sturgeon are found primarily in the Sacramento River and occasionally in the Feather River.

- **Sacramento Splittail**. Recent data indicate that Sacramento splittail occur in the Sacramento River as far upstream as RBDD (Sommer et al. 1997) and that some adults spend the summer in the mainstem Sacramento River rather than returning to the estuary (Baxter 1999). The distribution and extent of spawning and rearing along the mainstem Sacramento River is unknown.

Sacramento splittail spawn over flooded terrestrial or aquatic vegetation (Moyle 2002, Wang 1986). Sacramento splittail spawn in early March and May in lower reaches of the Sacramento River (Moyle et al. 1995). Spawning has been observed to occur as early as January and to continue through July (Wang 1986). Larval splittail are commonly found in the shallow, vegetated areas where spawning occurs. Larvae eventually move into deeper, open-water habitats as they grow and become juvenile. During late winter and spring, young-of-year juvenile splittail (i.e., those less than 1 year old) are found in floodplain habitat, sloughs, rivers, and Delta channels near spawning habitat. Juvenile splittail gradually move from shallow, nearshore habitats to the deeper, open-water habitats of Suisun and San Pablo Bays (Wang 1986). In areas upstream of the Delta, juvenile splittail can be expected to be present in the flood basins (i.e., Sutter and Yolo Bypasses and the Sacramento River) when these areas are flooded during winter and spring.

In 1999, after 4 years of candidate status, the splittail was listed as threatened under the ESA (64 FR 25, March 10, 1999). On September 22, 2003, USFWS withdrew splittail from the list of threatened species, indicating that habitat restoration actions implemented through the CALFED Bay-Delta Program and the Central Valley Project Improvement Act are likely to keep the splittail from becoming endangered in the foreseeable future (68 FR 55139, September 22, 2003). Sacramento splittail occur in the lower Sacramento River and could also occur in the NEMDC and NCC.

- **Hardhead**. Hardhead are widely distributed throughout the low- to mid-elevation streams in the main Sacramento–San Joaquin drainage, including the Sacramento River system. Undisturbed portions of larger streams at low to middle elevations are preferred by hardhead. Hardhead are able to withstand summer water temperatures above 20°C; however, they will select lower temperatures when they are available. Hardhead are fairly intolerant of low-oxygenated waters, particularly at higher water temperatures. Pools with sand-gravel substrates and slow water velocities are the preferred habitat; adult fish inhabit the lower half of the water column, while the juvenile fish remain in the shallow water closer to the stream edges. Hardhead typically feed on small invertebrates and aquatic plants at the bottom of quiet water (Moyle 2002). Hardhead is a Federal species of concern and a state species of special concern. Hardhead occur in the lower Sacramento River and could also occur in the NEMDC and NCC.

Designated Essential Fish Habitat

The lower Sacramento River, NCC, and the lowermost segment of the NEMDC have also been designated as Essential Fish Habitat by the Pacific Fishery Management Council to protect and enhance habitat for coastal marine fish and macroinvertebrate species that support commercial fisheries. Essential Fish Habitat is defined as waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. Under the Pacific Coast Salmon Fisheries Management Plan (Pacific Fishery Management Council 2003), the NCC and the lower segment of the NEMDC (i.e., below confluence with Dry Creek) have been designated as Essential Fish Habitat for fall-run Chinook salmon, and the Sacramento River has been designated as Essential Fish Habitat for spring-, fall-, late fall-, and winter-run Chinook salmon ESU.

3.8 CULTURAL RESOURCES

3.8.1 REGULATORY SETTING

3.8.1.1 FEDERAL

The following Federal law related to cultural resources is relevant to this analysis and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- National Historic Preservation Act of 1966, as Amended.

3.8.1.2 STATE

California Register of Historic Places

The California Register of Historic Resources (CRHR) includes resources that are listed in or formally determined eligible for listing in the National Register of Historic Places (NRHP) as well as some California State Landmarks and Points of Historical Interest (California PRC Section 5024.1, 14 CCR Section 4850). Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (State CEQA Guidelines CCR Section 15064.5[a][2]). The eligibility criteria for listing in the CRHR are similar to those for NRHP listing, but focus on the importance of the resources to California history and heritage. A cultural resource may be eligible for listing in the CRHR if it (see 14 CCR Section 4852):

(1) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(2) is associated with the lives of persons important in our past;

(3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(4) has yielded, or may be likely to yield, information important in prehistory or history.

Numerous historical resources are located within the Natomas Basin, including resources that are located near to the Phase 4b Project area. For a listing of these sites, refer to **Tables 3.8-3** and **3.8-4**, below.

California Law Governing Discoveries of Human Remains

California Health and Safety Code Section 7050.5(b) requires that the project proponent(s) notify the relevant County Coroner in the event of a discovery of human remains outside of a dedicated cemetery. In the event of a discovery the coroner shall determine if an investigation regarding the cause of death is required. If the discovered remains consist of a prehistoric Native American burial the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours after determining that the remains are subject to the jurisdiction of the NAHC (California Health and Safety Code Section 7050.5[c]).

Upon notification of a discovery the NAHC is required to identify a most likely descendant (MLD) within 48 hours, to provide the MLD with the opportunity to reinter the remains with appropriate dignity (California P RC Section 5097.98[a]). Mr. John Tayaba of the Shingle Springs Band of Miwok Indians (Tribe) has been designated MLD for the NLIP. It is assumed that he would decide how to reinter the discovered remains.

Native American Heritage Commission

The NAHC also identifies and catalogs places of special religious or social significance to Native Americans and known graves and cemeteries of Native Americans on private lands, and performs other duties regarding the preservation and accessibility of sacred sites and burials and the disposition of Native American human remains and burial items. Section 7.2.2, "Native American Consultation under CEQA," details correspondence between SAFCA and the NAHC.

3.8.1.3 REGIONAL AND LOCAL

There are no regional or local laws, regulations, policies, or ordinances related to cultural resources that are relevant to the NLIP, including the Phase 4b Project.

3.8.2 ENVIRONMENTAL SETTING

This section describes the prehistoric, ethnographic, and historic setting for the NLIP, including the Phase 4b Project, area. Known cultural resources identified in previous studies are also described. Section 3.8.1, above, "Regulatory Setting," describes the regulatory setting for the project.

3.8.2.1 PREHISTORIC AND ETHNOGRAPHIC SETTING

The Natomas Basin, is situated within the lands traditionally occupied by the Nisenan, or Southern Maidu. The language of the Nisenan, which includes several dialects, is classified within the Maiduan family of the Penutian linguistic stock (Kroeber 1925). The western boundary of Nisenan territory was the western bank of the Sacramento River and the area between present-day Sacramento and Marysville. In the Sacramento Valley, the tribelet, consisting of a primary village and a few satellite villages, served as the basic political unit (Moratto 1984). Valley Nisenan territory was divided into three tribelet areas, each populated with several large villages (Wilson and Towne 1978), generally located on low, natural rises along streams and rivers or on slopes with a southern exposure. One important village, Pusune, near Discovery Park, appears to have been recorded as CA-Sac-26. Other villages—Wollok, Leuchi, Wishuna, Totola, and Nawrean—were located east of the confluence of the Feather and Sacramento Rivers, near the northwestern portion of the Natomas Basin. Available data for the location of these villages is not precise enough to determine if they occur on or near components of the Phase 4b Project, but the proximity of these resources suggests sensitivity for undiscovered habitation sites.

Euro-American contact with the Nisenan began with infrequent excursions by Spanish explorers and Hudson Bay Company trappers traveling through the Sacramento and San Joaquin Valleys in the early 1800s. In general, Nisenan lifeways remained stable for centuries until the early to middle decades of the 19th century. With the coming of Russian trappers and Spanish missionaries, cultural patterns began to be disrupted as social structures were stressed. An estimated 75% of the Valley Nisenan population died in the malaria epidemic of 1833 (Wilson and Towne 1978). With the influx of Europeans during the Gold Rush era, the population was further reduced by disease and violent relations with the miners. However, today the Maidu are reinvesting in their traditional culture and, through newfound political, economic, and social influence, now constitute a growing and thriving native community in California.

The Tribe is descended from the Nisenan and Maidu people and attaches special cultural significance to the Natomas Basin because the Basin is situated in the Tribe's aboriginal territory. John Tayaba, a member of the Tribe, has been designated MLD pursuant to California PRC Section 5097.98, and is empowered to reinter Native American human remains that may be discovered on the project with appropriate dignity, subject to the limitations in that section as described above.

3.8.2.2 HISTORIC SETTING

In what is now known as the Sacramento and Sutter County region, agriculture and ranching were the primary industries during the historic period. Regional ranching originated on the New Helvetia rancho in the early 1840s. The Gold Rush precipitated growth in agriculture and ranching in the 1850s and 1860s, as ranchers and farmers realized handsome returns from supplying food and other goods to miners.

In 1911, the California Legislature established The Reclamation Board (now the CVFPB) to exercise jurisdiction over reclamation districts and levee plans. Subsequently, the state authorized the Sacramento River Flood Control Project (SRFCP). The ambitious project included the construction of levees, weirs, and bypasses along the river to channel floodwaters away from population centers. Under the SRFCP, new reclamation districts were created, including RD 1000, consisting of approximately 55,000 acres in the Natomas Basin. RD 1000 was largely controlled by the Natomas Company, which had access to more money than any individual landowner. The infrastructure of RD 1000 was completed in the 1920s. It includes levees, drainage canals, pumps, irrigation systems, agricultural fields, roads, and remnant natural features. The originally constructed features included

levees and exterior drainage canals, an interior drainage canal system, nine pumping plants, a series of levee and interior roads, and unpaved rights-of-way between the farm fields.

RD 1000 has been previously evaluated as a Rural Historic Landscape District on behalf of USACE and was found eligible for NRHP and CRHR listing (Dames & Moore 1994a). Dames & Moore determined that RD 1000 appears to be eligible for listing as a Rural Historic Landscape District at the state level of significance for the period from 1911 to 1939 under Criterion A of the NRHP. The area of significance is reclamation and the historical context is flood damage reduction and reclamation of the Sacramento River basin within the SRFCP as an important part of the history of reclamation and flood damage reduction. The district retains much of its historic integrity, including location, design, setting, materials, workmanship, feeling, and association. The contributing and noncontributing elements of the district were defined as part of this effort. Contributing elements were described as follows:

- **Drainage System:** East Levee, River Levee, NCC Levee; NEMDC; NCC; PGCC; Pumping Plant Nos. 1-A, 2, and 3; and the drainage ditches within the areas of contributing large scale land patterns.
- **Road System:** Garden Highway from Orchard Lane north to the NCC; East Levee/Natomas Road; Sankey Road; Riego Road; Elverta Road; Elkhorn Boulevard from Garden Highway to the western boundary of the Airport; Del Paso Road from Powerline Road to its intersection with I-5; San Juan Road from Garden Highway to its intersection with I-5; Powerline Road; El Centro Road from north of I-80 to its intersection with Bayou Way; and the road rights-of-way within fields in the areas of contributing large-scale land patterns.
- **Large-Scale Land Patterns:** Land area that is comprised of open fields formed by the intersection of the canals and roads in the area bounded as follows: west of the East Levee; west of Sorento Road; north of Del Paso Road between the East Levee and I-5, west of I-5 from its intersection with Del Paso Road to its intersection with I-80; north of I-80 from its intersection with I-5 to the Sacramento River Levee; east of the Sacramento River Levee; and south of the NCC Levee.

3.8.2.3 Records Search Results

Records searches for recorded cultural resources and studies were conducted by EDAW/AECOM (now AECOM) in 2006 and 2007. Most of the searches were conducted at the North Central Information Center (NCIC) of the California Historical Resources Information System, located at California State University, Sacramento. The NCIC records search covered portions of the project area in Sacramento County. Records searches were also conducted at the Northeast Information Center (NEIC), which maintains cultural resource records for Sutter County. The records searches included the levee ring around the Basin as well as all the lands inside the Natomas Basin so that changing project needs (e.g., the identification of alternate borrow sites) would be covered by the records searches.

The NEIC and NCIC reported that several cultural resource inventories have been conducted within the Natomas Basin. These are listed in **Tables 3.8-1** and **3.8-2**, respectively.

Numerous archaeological investigations have covered portions of the Natomas Basin. These have generally focused on areas closest to the rivers and levees. There has been very little archaeological inventory of lands more than 100 feet from the levee toes, and ground surface visibility has frequently been poor even in surveyed areas.

Numerous cultural resources were identified in the course of previous survey efforts, including ranches and farms; agricultural, transportation, and reclamation features; and debris scatters, as well as prehistoric occupation and burial sites, frequently seen as mounds or the disturbed remnants of mounds.

The most comprehensive of these investigations were completed by Dames & Moore and Far Western Anthropological Research Group (Far Western). In 1994, Dames & Moore (1994b) conducted a broad survey in

the Natomas Basin as part of the American River Watershed Investigation. A survey of selected parcels along the Sacramento River identified 17 primarily historic sites. During the same effort, Dames & Moore visited an additional 10 previously identified cultural resources to update site records for those locations. At the same time, Dames & Moore (1994a) prepared a draft historic property treatment plan that explored the history and elements of RD 1000. In 1996, Dames & Moore completed its evaluation of RD 1000, concluding that it appeared to be eligible for listing on the NRHP under Criterion A at a state level of significance as an example of reclamation and flood damage reduction in the Sacramento River basin during the period 1911–1939 (see Section 3.8.2.2, above). This report extensively documents both the contributing and noncontributing resources of RD 1000. Previously, in 1990, Far Western had conducted surveys of areas along the same route surveyed by Dames & Moore in 1994 (Dames & Moore 1994b), as well as of additional areas (Bouey and Herbert 1990). Far Western (Bouey, Berg, and Hunter 1991) followed up with limited test excavations of two sites south of the Airport.

3.8.2.4 Previously Recorded Cultural Resource Sites in the Sutter County Portion of the Natomas Basin (As of September 2006)

This section and **Table 3.8-3** describe cultural resources identified in previous studies on file at the NEIC within the Sutter County portion of the Natomas Basin. **Table 4.8-1** in Section 4.8, "Cultural Resources," lists cultural resources identified on or near the different components of the Phase 4b Project. Archaeological deposits identified on the landside of the Sacramento River east levee have the potential to extend underneath the existing levee and thus may be affected by landside and waterside activities.

Table 3.8-1
Previous Cultural Resources Surveys Conducted in the Natomas Basin in Sutter County

NEIC Report No.	Author(s)	Title	Date
1135	Bass, H. O.	*Department of Transportation Negative Archaeological Survey Report: State Route 99*	1983
7173	Cultural Resources Unlimited	*A Cultural Resources Study for Sutter Bay Project, Sutter County, California*	1992
7175	Cultural Resources Unlimited	*A Cultural Resources Study for Sutter Bay Project Highway 99/70 Interchange/Crossroad Improvements Sutter County, California*	1992
3469B	Dames & Moore	*Rural Historic Landscape Report for Reclamation District 1000 for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California*	1996
5777	Dames & Moore	*Historic Property Treatment Plan for Reclamation District 1000 Rural Historic Landscape District for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California*	1994
4197	Dames & Moore	*Archaeological Inventory Report, Natomas Locality, Cultural Resources Inventory and Evaluation, American River Watershed Investigation, El Dorado, Placer, Sacramento, and Sutter Counties, California*	1994
6892	Derr, E. H.	*American Basin Fish Screen and Habitat Improvement Project, Feasibility Study: Alternative 1C, 2C, 3, Sacramento and Sutter Counties, California*	2002
6944	Ebasco Environmental	*Cultural Resources Survey of the Sacramento Energy Project Sacramento County, California*	1992
5655	Egherman, R., and B. Hatoff	*Roseville Energy Facility Cultural Resources Appendix J-1 of Application for Certification*	2002
6945	Foster, J. W., and D. G. Foster	*An Archaeological Survey of the South Sutter Industrial Center Property, Sutter County, California*	1992

Table 3.8-1
Previous Cultural Resources Surveys Conducted in the Natomas Basin in Sutter County

NEIC Report No.	Author(s)	Title	Date
2987	Jensen, P.	*Historic Properties Survey Report for the Proposed Fifield Road at Pleasant Grove Creek Canal, Caltrans District 3, Sutter County, California*	1999
6893	Kaptain, N.	*Historic Property Survey Report for the State Route 99/Riego Road Interchange Project Sutter and Sacramento Counties*	2005
4658	Nelson, W. J., M. Carpenter, and K. L. Holanda	*Cultural Resources Survey for the Level (3) Communications Long Haul Fiber Optics Project. Segment WPO4: Sacramento to Redding*	2000
3469A	Peak & Associates	*Historic American Engineering Record Reclamation District 1000 HAER No. CA-187*	1997
1141	Wilson, K. L.	*Sacramento River Bank Protection Unit 34 Cultural Resources Survey Final Report*	1978

Note: NEIC = Northeast Information Center; HAER = Historic American Engineering Record
Source: Data provided by the NEIC in 2007 and compiled by EDAW/AECOM (now AECOM) in 2007

Table 3.8-2
Previous Cultural Resources Surveys Conducted in the Natomas Basin in Sacramento County

NCIC Report No.	Author(s)	Title	Date
–	Banek, B.	*An Archaeological Reconnaissance of the South Natomas Area for the River Bank Holding Company, Sacramento County, California*	1982
4188	Billat, L. B.	*Nextel Communications Wireless Telecommunications Service Facility—Sacramento County*	2001
–	Bouey, P. D.	*Cultural Resources Inventory and Evaluation: Sacramento River Bank Protection (Unit 44) Project*	1989
4206, part 1	Bouey, P. D., and R. Herbert	*Intensive Cultural Resources Survey and National Register Evaluation: Sacramento Urban Area Flood Control Project*	1990
6519	Bouey, P., J. Berg, J., and C. A. Hunter	*Cultural Resources Test Excavations, Sacramento Urban Area Flood Control Project, Sacramento County, California*	1991
4457	California Department of Transportation	*Negative Historic Property Survey Report for the Proposed Installation of Automatic Vehicle Census Systems on Interstate 80 East of the West El Camino Over-Crossing and on Highway 51 East of the "E" Street Ramps, Sacramento County, California*	2003
4194	Chavez, D., L. H. Shoup, C. Desgrandchamp, and W. G. Slater	*Cultural Resources Evaluations for the North Natomas Community Plan Study Area, Sacramento, California*	1984
4193	County of Sacramento Department of Environmental Review and Assessment	*Draft Environmental Impact Report for Teal Bend Golf Course Use Permit*	1995

Table 3.8-2
Previous Cultural Resources Surveys Conducted in the Natomas Basin in Sacramento County

NCIC Report No.	Author(s)	Title	Date
4190	CRS Archaeological Consulting and Research Services	*Sacramento Metro Airport Airmail Facility*—letter report	1988
3409	Cultural Resources Unlimited	*A Cultural Resources Study for Sacramento Area Flood Control Agency Borrow Sites Project Sacramento County*	1993
4463	Cultural Resources Unlimited	*A Cultural Resources Survey and Archival Review for the Arden-Garden Connector Project Sacramento County, California*	1992
3469B	Dames & Moore	*Rural Historic Landscape Report for Reclamation District 1000 for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California*	1996
4197	Dames & Moore	*Archaeological Inventory Report, Natomas Locality, Cultural Resources Inventory and Evaluation, American River Watershed Investigation, El Dorado, Placer, Sacramento, and Sutter Counties, California*	1994
5777	Dames & Moore	*Historic Property Treatment Plan for Reclamation District 1000 Rural Historic Landscape District for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California*	1996
4195	Derr, E.	*Cultural Resources Report: North Natomas Comprehensive Drainage Plan; Levee Improvements, Canal Widening and Additional Pumping Capacity*	1997
4466	Derr, E.	*Historic Resource Evaluation Report for the Arden-Garden Connector Project CT-03-30274.B1 Sacramento County, California*	1983
6892	Derr, E. H.	*American Basin Fish Screen and Habitat Improvement Project, Feasibility Study: Alternative 1C, 2C, 3, Sacramento and Sutter Counties, California*	2002
6944	Ebasco Environmental	*Cultural Resources Survey of the Sacramento Energy Project Sacramento County, California*	1992
5655	Egherman, R., and B. Hatoff	*Roseville Energy Facility Cultural Resources Appendix J-1 of Application for Certification*	2002
3489A	Far Western Anthropological Research Group	*Report on the First Phase of Archaeological Survey for the Proposed SMUD Gas Pipeline Between Winters and Sacramento Yolo and Sacramento Counties, California*	1993
3489B	Far Western Anthropological Research Group	*Addendum to the Report on the First Phase of Archaeological Survey for the Proposed SMUD Gas Pipeline Between Winters and Sacramento Yolo and Sacramento Counties, California*	1993
4206, part 2	Far Western Anthropological Research Group	*Intensive Cultural Resources Survey and National Register Evaluation: Sacramento Urban Area Flood Control Project*—letter report to SHPO	2005
–	Foster, J. W.	*A Cultural Resource Investigation of the Blue Oaks Skilled Nursing Facility Site Auburn, California*	1995

Table 3.8-2
Previous Cultural Resources Surveys Conducted in the Natomas Basin in Sacramento County

NCIC Report No.	Author(s)	Title	Date
–	Glover, L. C., and P. D. Bouey	*Sacramento River Flood Control System Evaluation, Mid-Valley Area Cultural Resources Survey, Colusa, Sacramento, Sutter, Yolo, and Yuba Counties, California*	1990
4449	Herbert, R. F.	*Report on the National Register Eligibility of the Sacramento River Docks Building 37 McClellan Air Force Base, Sacramento, California*	1995
5803	Herbert, R. F.	*Report on the National Register Eligibility of the Sacramento River Dock Complex including Building 4635 (Dock) and Building 4637 (Warehouse) McClellan Air Force Base, Sacramento, California*	1995
4202	Humphreys, S., and L. McBride	*A Review of the Work Carried Out at Sacramento 16, the Bennett Mound*	1966
4178	Jones & Stokes	*Archaeological Survey Report for the North Natomas Drainage System's San Juan Pump Station*	1992
2956	Nadolski, J. A.	*Archaeological Survey Report for the Jibboom Street Bridge Project Sacramento, California*	2001
4435	Nadolski, J. A.	*Archaeological Investigations for the Sacramento-KOVR Diverse Lateral Overbuild in Sacramento and Yolo Counties*	2001
5810	PAR Environmental Services, Inc.	*Northgate Boulevard/Arden-Garden Intersection Cultural Resources Investigation, City of Sacramento, Sacramento County, California*	n.d.
4187	Pastron, A. G., and R. K. Brown	*Historical and Cultural Resource Assessment Proposed Telecommunications Facility Natomas Park, Site No. SA-750-01 2450 Del Paso Road, Sacramento County, California*	2001
173	Peak, A. S.	*American River Parkway An Archaeological Perspective*	1973
2764	Peak & Associates	*Historic Property Survey Report and Finding of No Adverse Effect for the Proposed American River Parkway Bike Trail Improvement Project, City and County of Sacramento, California*	2001
2765	Peak & Associates	*Archaeological Survey Report for the Proposed American River Parkway Bike Trail Improvement Project, City and County of Sacramento, California*	2001
3469A	Peak & Associates	*Historic American Engineering Record Reclamation District 1000 HAER No. CA-187*	1997
4173	Peak & Associates	*Report on the Archaeological Testing Within the Riverbend Classics Project Area, City of Sacramento, California*	1999
4181	Peak & Associates	*Cultural Resources Overview for the North Natomas Long-Term Planning Area, Sacramento County, California*	2000
6830	Peak & Associates	*Determination of Eligibility and Effect for the Natomas Panhandle Annexation Project Area Sacramento County, California*	2005
4201	Peak, A. S., H. L. Crew, and R. Gerry	*The 1971 Archaeological Salvage of the Bennett Mound, CA-SAC-16, Sacramento, CA*	1984
4456	Ritchie, M.	*Finding of Effect for the Proposed Safety Improvements and Rehabilitation of the Jibboom Street Bridge on Jibboom Street, Bridge No. 24C-022, Sacramento, Sacramento County, California*	2001

Table 3.8-2
Previous Cultural Resources Surveys Conducted in the Natomas Basin in Sacramento County

NCIC Report No.	Author(s)	Title	Date
–	Snyder, J. W.	*Historic Property Survey Report (Positive) for the Jibboom Street Bridge Safety Improvements and Rehabilitation Project Jibboom Street, Sacramento County, California*	2003
4441	Sonoma State Anthropological Studies Center	*Archaeological Surface Reconnaissance and Backhoe Testing for the South Natomas Projects (P92-122, P92-160) Sacramento County, California*	1992
3408	Theodoratus Cultural Research	*Discovery Park Construction Site Examination for Archaeological Resources in the Area of CA-Sac-26*—letter report	1981
4458	True, D. L.	*8-Acre Survey at 1801 Garden Highway, Sacramento, California*	1983
1141	Wilson, K. L.	*Sacramento River Bank Protection Unit 34 Cultural Resources Survey Final Report*	1978

Note: NCIC = North Central Information Center; SMUD = Sacramento Municipal Utility District; SHPO = State Historic Preservation Officer; HAER = Historic American Engineering Record
Source: Data provided by the NCIC and compiled by EDAW/AECOM (now AECOM) in 2007

Table 3.8-3
Cultural Resources in the Sutter County Portion of the Natomas Basin

Trinomial or Temporary Designation	P-No.	Historic/ Prehistoric	Description	Date Recorded	Quadrangle
CA-Sut-84H	51-000084	Historic	NCC/PGCC levees	1994	Pleasant Grove, Verona
	51-000096H	Historic	1950s-era ranch	2002	Taylor Monument
CA-Sut-80H	51-000080H	Historic	Debris scatter	2009	Pleasant Grove

Notes: NCC = Natomas Cross Canal; PGCC = Pleasant Grove Creek Canal
Source: Data provided by the NCIC and compiled by EDAW/AECOM (now AECOM) in 2007

- **CA-Sut-84H (P-51-000084)**. This trinomial includes both the NCC south levee and the PGCC west levee, the northernmost contributing resources to RD 1000. The NCC levee measures approximately 25 feet wide at the top and 75 feet wide at the base, and is 15 feet high. The top has been graded and graveled for vehicle traffic. The PGCC west levee is smaller, measuring approximately 20 feet wide at the top, 60 feet wide at the base, and 10 feet high.

  Archaeologists reported that one of the levees was raised and strengthened twice, after flooding during 1938–1939 and after flooding in RD 1001 during 1955. However, records fail to specify if the changes were made to the NCC or the PGCC. RD 1000 modified the NCC south levee and its adjacent canals in 1987 and SAFCA modified them in 1996. SAFCA completed installation of the cutoff wall in the NCC south levee and reconstruction of most of the levee embankment, including raising the levee in fall 2009.

- **P-51-000096H**. Located on the Sacramento/Sutter County line and at the edge of a proposed borrow area, this resource consists of a historic ranch complex that includes two residences, four sheds or barns, and a trailer. The archaeological survey crew was not allowed on the property to record updates to the existing records.

- **CA-Sut-80H (P-51-000080H)**. Located just north of the Sacramento-Sutter County line and just east of the NEMDC this resource consists of a trash scatter that was determined ineligible for listing on the NRHP (EBASCO 1992a, 1992b).

In addition to the resources in the Sutter County portion of the Natomas Basin, the Pleasant Grove Cemetery District cemetery occurs on the northern edge of the proposed Triangle Properties Borrow Area. Although the cemetery is not recorded as a cultural resource, it contains human remains subject to management required under CEQA. The cemetery occurs on the south side of Howsley Road east of the intersection with Pacific Avenue. This resource would be excluded from the footprint of borrow activities.

3.8.2.5 Previously Recorded Cultural Resource Sites in the Sacramento County Portion of the Natomas Basin (as of May 2008)

This section describes cultural resource sites identified in previous studies on file at the NCIC in the Sacramento County portion of the Natomas Basin (listed in **Table 3.8-4** and described below). For a discussion of specific resources identified near or within the Phase 4b Project area, see **Table 4.8-1** in Section 4.8, "Cultural Resources"). Archaeological deposits identified on the landside of the Sacramento River east levee have the potential to extend underneath the existing levee and thus may be affected by landside and waterside activities.

- **CA-Sac-15/H**. This site, near the Sacramento River east levee south of I-5, consists of a prehistoric occupation midden mound with a concentration of debitage, flaked stone tools, shell artifacts, faunal remains, fire-cracked rock, and baked clay objects. The mound has been heavily affected by farming and ranching activities. There is a ranch complex including a bunkhouse, garden, shed, chicken coop, water tower, garage, and driveway on the mound; historic debris on the site includes glass and broken ceramic fragments. A limited auger testing program was carried out west of the mound along the Sacramento River east levee and found no cultural materials along that transect (Bouey and Herbert 1990).

- **CA-Sac-16/H (P-34-000043)**. CA-Sac-16/H is in the Airport north bufferlands south of the Airport Operations Area. This site has been variously called the Bennett Mound, Mound Ranch, Willey Mound, and S-16. It includes the remains of a prehistoric occupation mound, possibly the largest in the Sacramento Valley, but has been leveled in stages by agricultural activities. The site location corresponds to the ethnographic village of Nawrean. What remains today consists of dark midden soils in plowed fields with fragments of human remains, shell, fire-cracked rock, baked clay objects, ground stone, faunal bone, flaked stone artifacts, and debitage. A few historic artifacts, such as brick and ceramic fragments, are also on this site. Today, two separate loci have been identified and recorded as CA-Sac-16/H; the larger, Locus 1, represents the approximate original location of the mound. Locus 2 is an area of redeposited soil taken from the mound in the past. There is also a historic-era component of the site from the remnants of a slaughterhouse and brick factory present before the 1930s. Historic artifacts noted include bricks, sawed mammal bone, a filled-in privy, bottles, ceramic and metal fragments, and glass.

  The site was originally described as very large, up to 7 acres in area, and 20 feet high. The earliest investigations were conducted in 1923 by Zallio, who excavated at the site a number of times and recovered projectile points, bone tools, Haliotis ornaments, and other artifacts (Bouey, Berg, and Hunter 1991). It was first formally recorded in 1934 by Heizer, who identified it as a large mound with stone artifacts and freshwater shell on the surface. Sacramento Junior College (now Sacramento Community College) excavated pits and trenches up to 18 feet deep in 1936–1937. The main focus of this effort was on recovery of mortuary remains; however, considerable quantities of nonburial associated artifacts were also documented. More excavations were conducted by Sacramento State College in 1953 and by American River College between 1966 and 1971, and more artifacts and burials were salvaged by Peak, Crew, and Gerry (1984) when what was left of the mound was leveled. At that time, Peak, Crew, and Gerry estimated that as much as 13 feet of the mound might still be present below the plowed surface. As an interesting side note—and as an indication

Table 3.8-4
Cultural Resources in the Sacramento County Portion of the Natomas Basin

Trinomial	P-No.	Historic/ Prehistoric	Description	Date Recorded	Quadrangle
CA-Sac-15/H	34-000042	Both	Occupation mound with historic debris	1934, 1990, 1993	Taylor Monument
CA-Sac-16/H	34-000043	Both	Occupation/burial mound with historic debris and foundations	1934, 1966, 1984, 1987, 1990, 1993	Taylor Monument
CA-Sac-17	34-000044	Prehistoric	May have been destroyed	1934, 1990	Taylor Monument
CA-Sac-18	34-000045	Prehistoric	Lithic scatter	1934, 1994	Taylor Monument
CA-Sac-160/H	34-000187	Both	Occupation/burial mound with historic farm	1947, 1949, 1994	Taylor Monument
CA-Sac-164	34-000191	Prehistoric	Occupation/burial site nominated to NRHP	1972, 1982, 1988, 1989, 1990, 1991, 2001–2007	Sacramento West
CA-Sac-430H	34-000457	Historic	West drainage canal	1991, 1993, 1997	Taylor Monument
CA-Sac-483/H	34-000510	Historic	Krumenacher Ranch complex and relocated prehistoric artifacts	1994	Rio Linda
CA-Sac-484H	34-000511	Historic	Historic debris	1994	Rio Linda
CA-Sac-485/H	34-000512	Both	Occupation/burial mound and historic home site	1994	Taylor Monument
CA-Sac-486H	34-000513	Historic	Historic home site	1994	Taylor Monument
CA-Sac-487H	34-000514	Historic	Historic debris and vegetation	1994	Taylor Monument
CA-Sac-488H	34-000515	Historic	Historic debris and vegetation	1994	Taylor Monument
CA-Sac-489H	34-000516	Historic	Historic debris and vegetation	1994	Taylor Monument
CA-Sac-490H	34-000517	Historic	Historic debris and vegetation	1994	Taylor Monument
CA-Sac-491H	34-000518	Historic	Historic debris and vegetation	1994	Taylor Monument
CA-Sac-492H	34-000519	Historic	Historic well, pipes and vegetation	1994	Taylor Monument
CA-Sac-493H	34-000520	Historic	Historic debris	1994	Taylor Monument
CA-Sac-494H	34-000521	Historic	Historic debris	1994	Taylor Monument
CA-Sac-517H	34-000641	Historic	Historic debris	2001	Rio Linda
CA-Sac-518H	34-000647	Historic	Concrete bridge abutment	2001	Rio Linda
CA-Sac-569H	34-000741	Historic	Paved road	1994, 1998	Taylor Monument, Rio Linda
CA-Sac-836H	34-001354	Historic	Farm Complex	2005	Taylor Monument
	34-000883	Historic	Paved road	1998	Taylor Monument
	34-000884	Historic	Paved road	1998	Taylor Monument
	34-000886	Historic	Paved road	1998	Rio Linda, Taylor Monument
	34-001552	Historic	House	2002	Taylor Monument
	34-001557	Historic	Pumping plant	2006	Taylor Monument
	34-001558	Historic	Pumping plant	2006	Taylor Monument
	34-001559	Historic	Pumping plant	2006	Taylor Monument

Note: NRHP = National Register of Historic Places
Source: Data provided by the NCIC and compiled by EDAW/AECOM (now AECOM) in 2007 and 2008

of the original CA-Sac-16/H mound's prominence—Peak, Crew, and Gerry mention that Heinrich Schliemann (an amateur archaeologist and later the discoverer of Troy) visited the site in 1851–1852.

More recently, Bouey and Herbert (1990) completed a surface survey and excavated two auger holes at the toe of the levee that forms the western boundary of the site; they reported evidence of subsurface cultural deposits, including shell midden. Larger-scale excavations (Bouey, Berg, and Hunter 1991), dug within 100 feet of the levee toe and the ramp leading up to Garden Highway, confirmed that midden deposits still exist; however, agricultural activity seems to have destroyed any stratigraphic integrity the deposits might have had that close to the levee. It may be that Bouey and Herbert were looking strictly at redistributed mound soils.

The summary of the research done by 1991 (Bouey, Berg, and Hunter 1991) agreed with the conclusions of Derr (1983) that the site was a large, permanent habitation locus occupied from the Upper Archaic (ca. 1000 B.P.) to just after the beginning of European contact. Derr found that the upper 20–60 centimeters of soil (in the areas he examined near the levee) consisted of redistributed midden with artifacts and isolated human remains. What appears to be missing from any of these analyses is an attempt to define the original mound or to find intact elements of the site that may have been located beyond the original mound. If there are intact subsurface deposits associated with CA-Sac-16/H, then the site may be eligible for listing on the CRHR or NRHP because of the potential information contained in those deposits.

The earliest documentation, Heizer's site record form from 1934, does not give dimensions for the mound and does not contain specific enough information to provide for relocation of the original boundaries of the mound. It is presumed that the dispersed midden from the mound now covers a larger surface area than the mound used to occupy. However, it is unclear exactly how large an area that is because various investigations have reported Locus 1 (the larger site deposit) as measuring 110 meters by 185 meters (Bouey and Herbert 1990), 250 meters by 250 meters (Kauffman and Kauffman 1987), and 450 meters by 850 meters (Dames & Moore 1993). The Dames & Moore site record form appears to be the only one that maps out the secondary Locus 2 area, northeast of the main deposit and east of a drainage ditch (as of 1993).

- **CA-Sac-17 (P-34-000044)**. This is the location of a mound site reported by Heizer in 1934 west of Fisherman's Lake; however, none of the mound remains. In 1990, Bouey and Herbert attempted to locate any cultural remains but could not find any evidence of cultural deposits on the surface or in auger holes.

- **CA-Sac-18 (P-34-000045)**. This site, landward of the Sacramento River east levee located north of San Juan Road, consists of a sparse scatter of basalt debitage, one cryptocrystalline biface fragment, a polished stone, and possible fire-cracked rock. It was originally described by Heizer as a mound 30 yards in diameter and 5 feet high; however, Heizer may have misinterpreted a natural rise in the landscape as a mound. CA-Sac-18 appears to be lacking the intensive cultural deposits that are the hallmark other nearby known mound sites (Dames & Moore 1994b).

- **CA-Sac-160/H (P-34-000187)**. This is a multicomponent site near the Sacramento River east levee located north of San Juan Road. It includes a prehistoric occupation mound with a farm complex situated on top. Excavations in the 1940s removed numerous burials and artifacts, including ground stone, flaked stone tools, shell beads and ornaments, fire-cracked rock, baked clay objects, stone beads, faunal remains, bone awls, bird bone tubes and whistles, obsidian drills, quartz crystals, charmstones, and historic glass trade beads, as well as historic debris related to farming and occupation of the top of the mound.

- **CA-Sac-164 (P-34-000191)**. CA-Sac-164 is a very large, deeply stratified prehistoric occupation and burial mound near Sand Cove Park on the Sacramento River that has been explored a number of times using archaeological techniques; however, in spite of these efforts, the true boundaries of the site remain unknown. The site includes shell midden with abundant cultural materials including fire-cracked rock, flaked and ground stone tools, charmstones, polished bone implements, debitage, quartz crystals, bone and shell beads,

baked clay objects, and plentiful faunal remains. Large fire-cracked rock features and hearths have also been noted. Because of its significant scientific value and the integrity, CA-Sac-164 was nominated for NRHP listing in 2001.

The site was first recorded in 1951, after a newspaper article reported that human remains and stone tools were eroding out of the cutbank and into the Sacramento River. Observers who walked along the edge of the cutbank in summer and fall when the river was at its lowest noted that site deposits, interspersed with flood-deposited silt, extended at least 4 meters below the current-day surface. Excavations in the 1970s, 1980s, and 1990s confirmed the depth of intact and resource-bearing cultural strata at the site. Work on the landside of the Sacramento River levee indicated that downward-trending cultural strata might be found there as well, beginning well over a meter below the ground surface.

Annual river height fluctuation, wave action resulting from boat wakes, and looting combined to cause continual erosion and collapse of the cutbank. This resulted in artifacts and remains falling onto the beach area below, where they either washed into the river or collected by the public. To address this issue, a site stabilization program was implemented in 2005 that included placing dirt and plantings over the cutbank and creating a wave break near the river's edge of the site.

- **CA-Sac-430H (P-34-000457)**. This feature is the West Drainage Canal, a relatively unmodified canal that originates at Fisherman's Lake and flows southeast to the NEMDC.

- **CA-Sac-483/H (P-34-000510)**. This site consists of two loci containing a historic ranch complex with a small prehistoric component. The ranch complex (Locus 1) includes barns, sheds, shops and residences, farm equipment, and glass, ceramic, and metal debris. The prehistoric component consists of a relocated collection of mortars, pestles, and a mano located in a flower garden. The property owner reported that the prehistoric artifacts may have been collected from an eroding knoll near Locus 2.

- **CA-Sac-484H (P-34-000511)**. This site comprises a light scatter of historic debris located along the north side of a small knoll. The debris is associated with a house that was built for a security guard; the house has been demolished. The debris includes fragments of water pipe, concrete, milled lumber, metal, and glass.

- **CA-Sac-485/H (P-34-000512)**. This site, between the Sacramento River's east levee and the proposed location of the relocated Elkhorn Canal, was once a prehistoric occupation and burial mound that has been leveled by agricultural activities and was documented by Dames & Moore in 1994. The remains of a historic-era homestead, consisting mainly of ornamental vegetation, driveway, and historic debris, were noted on top of the prehistoric site. Dames & Moore archaeologists noted that the prehistoric component was large, measuring 220 meters by 160 meters with two depositional loci—a larger area near Garden Highway and a smaller deposit to the east. Prehistoric artifacts noted at the time included obsidian and basalt flakes and tools, shell beads and ornaments, faunal remains, ground-stone fragments, charmstones, baked clay, imported exotic tool stone, and shell.

  In August 2007, archaeologists undertook a limited shovel testing program at CA-Sac-485/H to determine whether there was an undisturbed subsurface deposit that could be affected by the proposed canal construction near this site. The 2007 investigation began with a survey of the site area where a sparse assortment of artifacts was visible; because no concentrations of artifacts were identified on the surface, the Dames & Moore archaeological site map was used to guide the placement of shovel test pits (STPs). Brian Padilla, of the El Dorado Miwok, was present while the STPs were excavated.

  During the course of excavations, archaeologists uncovered artifacts including obsidian and basalt flakes; clamshell disk beads; burned earth; faunal remains, including freshwater mussel shell; and fire-cracked rock. Human remains were uncovered in three of the STPs; the Sacramento County coroner and Native American Heritage Commission were contacted, excavation of each of those three STPs was halted immediately, and

the remains were reburied where they were found. None appeared to be part of a larger, intact burial and all were found in the upper 50 centimeters of soil (SAFCA 2007).

In general, site soils consisted of dry compact silts with a small sand and clay content; excavation and screening were difficult because the soils were very dry and hard. If artifacts were recovered, excavation generally proceeded to 100 centimeters below surface (cmbs); where no artifacts were found, excavations terminated around 80 cmbs. A deeply buried midden layer was identified in each of the four STPs (Numbers 4, 6, 21, and 24) closest to the levee, beginning anywhere from 55 cmbs to 80 cmbs. Excavation halted at approximately 100 cmbs in these STPs without reaching the bottom of the midden deposit; a split-spoon probe was used in STP No. 21 to find the bottom of the deposit, which was reached at approximately 160 cmbs. Although the northern and southern edges of the midden deposit were not located, the STP program was halted on the assumption that a more formal testing program, using a combination of test units and additional STPs, would be implemented as part of more detailed design of the proposed project.

The site has subsequently been capped under a seepage berm that was constructed with methods designed to minimize impacts on the resource, pursuant to consultation between USACE, SAFCA, and the Tribe.

- **CA-Sac-486H (P-34-000513)**. This site near the Sacramento River east levee located south of the North Drainage Canal consists of the remains of a historic-era homestead. The structure that once stood on the site has been demolished. Remnant landscape plantings and debris consisting of ceramic fragments, bottle glass, ceramic, bricks, mortar, and metal fragments were noted. The structures were visible in a 1937 aerial photograph and were depicted on the 1967 U.S. Geological Survey topographic quadrangle map. The archaeologists who identified the site in 1994 noted that some of the trees appeared to be less than 30 years old, although a fragment of amethyst glass (generally associated with the turn of the century) was noted.

- **CA-Sac-487H (P-34-000514)**. Like CA-Sac-486H, this location near the Sacramento River east levee located south of the North Drainage Canal includes historic debris, such as concrete fragments, milled lumber, metal fence posts, wire, farm machinery parts, clear and green glass, window glass, and ornamental plantings, all of which indicate that a structure existed at the site at one point but has since been demolished. Also like the previous site, a structure was visible in this location in a 1937 aerial photograph; several structures were indicated on the 1950 and 1975 topographic quadrangle maps for the area.

- **CA-Sac-488H (P-34-000515)**. This is another site near the Sacramento River east levee located south of the North Drainage Canal where a structure appeared on a 1937 aerial photograph and 1950 topographic quadrangle map, although no building is on the site today. Historic debris, ornamental vegetation, and a fence line remain. The debris included various concrete fragments, corrugated metal, wire, culvert pipe, and a large section of iron pipe.

- **CA-Sac-489H (P-34-000516)**. This is another site near the Sacramento River east levee located south of the North Drainage Canal where a structure appeared on a 1937 aerial photograph and 1950 topographic quadrangle map, although no building is on the site today. The associated debris includes a fenced-off well head, concrete fragments, lumber, window glass, wooden posts, galvanized pipes, old fencing overgrown by an oak tree, an enamelware bucket, tires, ceramic fragments, bottle glass, and a metal bucket. Ornamental landscaping plants were also noted.

- **CA-Sac-490H (P-34-000517)**. This site, near the south end of Powerline Road, had three structures that appeared on a 1937 aerial photograph and 1950 topographic quadrangle map, although no building is on the site today. The historic debris is similar to the debris found at sites CA-Sac-486H through CA-Sac-489H, including concrete, brick, iron piping, a fence post, bottle glass, ceramic fragments, and galvanized metal pipe, as well as remnant ornamental vegetation.

- **CA-Sac-491H (P-34-000518)**. This site, near the south end of Powerline Road, was likely used in association with four structures that appeared on the 1950 topographic quadrangle map. The 1937 aerial photograph

associated with other sites listed here includes coverage of this property; however, only trees are clearly visible in the photograph. The artifacts consist of a sparse scatter, including a wood fence, concrete fragments, bricks, and metal fence posts. Ornamental vegetation was noted nearby.

- **CA-Sac-492H (P-34-000519)**. This site, near the south end of Powerline Road, consists of a concrete-capped well, associated water pipes, and remnant ornamental vegetation and fruit trees that were likely associated with a structure visible on the 1950 topographic quadrangle map of the area. A cluster of trees is visible in the 1937 aerial photograph, but no structures are clearly visible. The site is now used to keep honeybees.

- **CA-Sac-493H (P-34-000520)**. The 1950 topographic quadrangle map and 1937 aerial photograph of the region indicate that there was once a large barn and associated structure at this location near the Sacramento River east levee located south of I-5. Today, scattered historic debris—clear and colored glass, porcelain and earthenware, iron pipe, bone fragments, brick, and a white ceramic insulator—is all that remains.

- **CA-Sac-494H (P-34-000521)**. This is another site, west of Fisherman's Lake, where a structure appeared on a 1937 aerial photograph and 1950 topographic quadrangle map, although no building is present today. Associated debris documented by an archaeological team in 1994 included concrete and brick fragments, an iron water pipe, white ceramic insulators, and clear bottle glass. In addition, the archaeologists noted abundant modern debris on the site, making it difficult to distinguish between modern and historic artifacts.

- **CA-Sac-517H (P-34-000641)**. This is an historic trash scatter exposed on both the east and west sides of the NEMDC. Components include milk glass fragments, electric insulator fragments, and candy dish fragments.

- **CA-Sac-518H (P-34-000647)**. This is a concrete bridge abutment located just north of the Silver Eagle Road crossing of the NEMDC. The abutments have cobblestone facing over concrete.

- **CA-Sac-569H (P-34-000741)**. This is a segment of Del Paso Road, a two-lane paved road that extends from Powerline Road to East Levee Road. Del Paso Road likely originated as a dirt farm road and has subsequently been modernized, paved, and widened.

- **CA-Sac-836H (P-34-001354)**. This resource, located near the Sacramento River east levee located south of West Elverta Road, consists of the Yuki Pear Farm complex with a relocated ranch house, a 1930s barn, a 1940s bunkhouse/workshop/garage, a 1960s bunkhouse, a 1974 residence, and a mid-1970s barn. A 1903 map shows the Farmers and Merchants Bank as the property owners; no improvements were listed on any maps in the next several years. By 1939, the property belonged to the California Trust and Savings Band; it later was owned by Thomas and Nancy McDermott. The McDermotts sold the land to A. R. Galloway, who never lived on the property but rented it to Masami Yuki as a tenant farmer. The Yuki family originally grew asparagus at the farm but switched to tomatoes in 1968 and planted the pear orchard in 1969.

- **P-34-000883H**. This is El Centro Road, a north-south, paved two-lane road that dates to the period before 1921. It runs between I-80 to the south and Bayou Road to the north. It is likely that this was originally a dirt farm road that has been paved a number of times.

- **P-34-000884H**. This is San Juan Road, an east-west, paved two-lane road that dates to the period before 1921. It runs between I-80 and the Sacramento River east levee. It is likely that this was originally a dirt farm road that has been paved a number of times in the past.

- **P-34-000886H**. This is Elkhorn Boulevard, an east-west, paved two-lane road that dates to the period before 1921. It runs between the Sacramento River east levee and the NEMDC. It is likely that this was originally a dirt farm road that has been paved a number of times in the past.

- **P-34-001552H**. This site includes a 1950s-era house and shed, surrounded by a chain link fence. The house is located along Garden Highway, near the northern Sacramento-Sutter County line.

- **P-34-001557H**. This structure is a concrete valve tank associated with the Prichard Lake Pumping Plant at the end of the North Drainage Canal.
- **P-34-001558H**. This resource consists of a concrete-lined sump 50 feet long and 25 feet wide associated with the Prichard Lake Pumping Plant.
- **P-34-001559H**. This is a concrete pad near the P-34-001558H sump. It is also associated with the Prichard Lake Pumping Plant.

3.9 PALEONTOLOGICAL RESOURCES

Paleontological resources (fossils) are the remains or traces of prehistoric animals and plants that are 11,000 years old or older.

3.9.1 REGULATORY SETTING

3.9.1.1 FEDERAL

There are no Federal laws, regulations, policies, or ordinances related to paleontological resources that are relevant to the NLIP, including the Phase 4b Project.

3.9.1.2 STATE

There are no state laws, regulations, policies, or ordinances related to paleontological resources that are relevant to the NLIP, including the Phase 4b Project. No state or local agencies have specific jurisdiction over paleontological resources on private lands. No state agency requires a paleontological collecting permit to allow for the recovery of fossil remains discovered as a result of construction-related earthmoving on state or private land at a project site.

3.9.1.3 REGIONAL AND LOCAL

There are no regional or local laws, regulations, policies, or ordinances related to paleontological resources that are relevant to the NLIP, including the Phase 4b Project.

Society of Vertebrate Paleontology Guidelines

The Society of Vertebrate Paleontology (1995, 1996), a national scientific organization of professional vertebrate paleontologists, has established standard guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, specimen preparation, analysis, and curation. Most practicing professional paleontologists in the nation adhere to the Society of Vertebrate Paleontology assessment, mitigation, and monitoring requirements, as specifically spelled out in its standard guidelines.

3.9.2 ENVIRONMENTAL SETTING

3.9.2.1 PALEONTOLOGICAL RESOURCE INVENTORY

Stratigraphic Inventory

Geologic maps and reports covering the geology of the project site and surrounding study area were reviewed to determine the exposed rock units and to delineate their respective aerial distributions in the project area. Regional and local surficial geologic mapping and correlation of the various geologic units in the vicinity of the project

area has been provided at a scale of 1:62,500 by Helley and Harwood (1985); and 1:250,000 by Wagner et al. (1987). The rock formations of the project area are shown in **Plate 3-5** and described below.

- **Holocene Alluvium**. Sediments adjacent to the Sacramento and American Rivers are composed of Recent (Holocene) alluvial floodplain deposits (Wagner et al. 1987). In general, these deposits consist primarily of unconsolidated sand and silt. Holocene alluvial deposits overlay an older alluvial fan system composed of Pleistocene-age sediments. Construction activities that would occur within alluvial floodplain or basin deposits would be located within Holocene sediments. By definition, sediments associated with Holocene-age alluvium are too young to contain paleontologically sensitive resources.

- **Riverbank and Modesto Formations**. Piper et al. (1939) were the first to publish detailed geologic maps in the southern Sacramento and northern San Joaquin Valley areas, and they designated the older alluvial Pleistocene deposits as the Victor Formation. However, Davis and Hall (1959) proposed a subdivision of the Victor Formation into the Turlock Lake (oldest), Riverbank (middle), and Modesto (youngest) Formations. Marchand and Allwardt (1981) proposed that the Victor Formation be replaced by the Turlock Lake, Riverbank, and Modesto Formations as formal nomenclature for Quaternary deposits in the Sacramento and San Joaquin Valleys. Most researchers have followed this recommendation.

  In the Sacramento Valley, the Modesto Formation consists of alluvial terraces, some alluvial fans, and some abandoned channel ridges of the Sacramento River. The Modesto Formation can be divided into upper and lower members. The upper member consists primarily of unconsolidated, unweathered, coarse sand and sandy silt. The age of this member has been placed at approximately 12,000–26,000 years Before Present (B.P.) (Atwater cited in Helley and Harwood 1985). The lower member of the Modesto Formation consists of consolidated, slightly weathered, well-sorted silt and fine sand, silty sand, and sandy silt. Age estimates for the lower member range from 29,000 to 42,000 years B.P. (Marchand and Allwardt 1981, cited in Helley and Harwood 1985).

  Sediments in the Riverbank Formation consist of weathered reddish gravel, sand, and silt that form alluvial terraces and fans. In the Sacramento Valley, this formation tends toward soil-profile developments that are more easily distinguishable from the Modesto Formation (Helley and Harwood 1985). The Riverbank Formation is Pleistocene in age (Wagner et al. 1987), but it is considerably older than the Modesto Formation; estimates place the age of the Riverbank between 130,000 and 450,000 years B.P. (Helley and Harwood 1985). The Riverbank Formation forms alluvial fans and terraces of the Sacramento River. The Riverbank's fans and terraces are higher in elevation and generally have a more striking topography than those formed by the Modesto Formation.

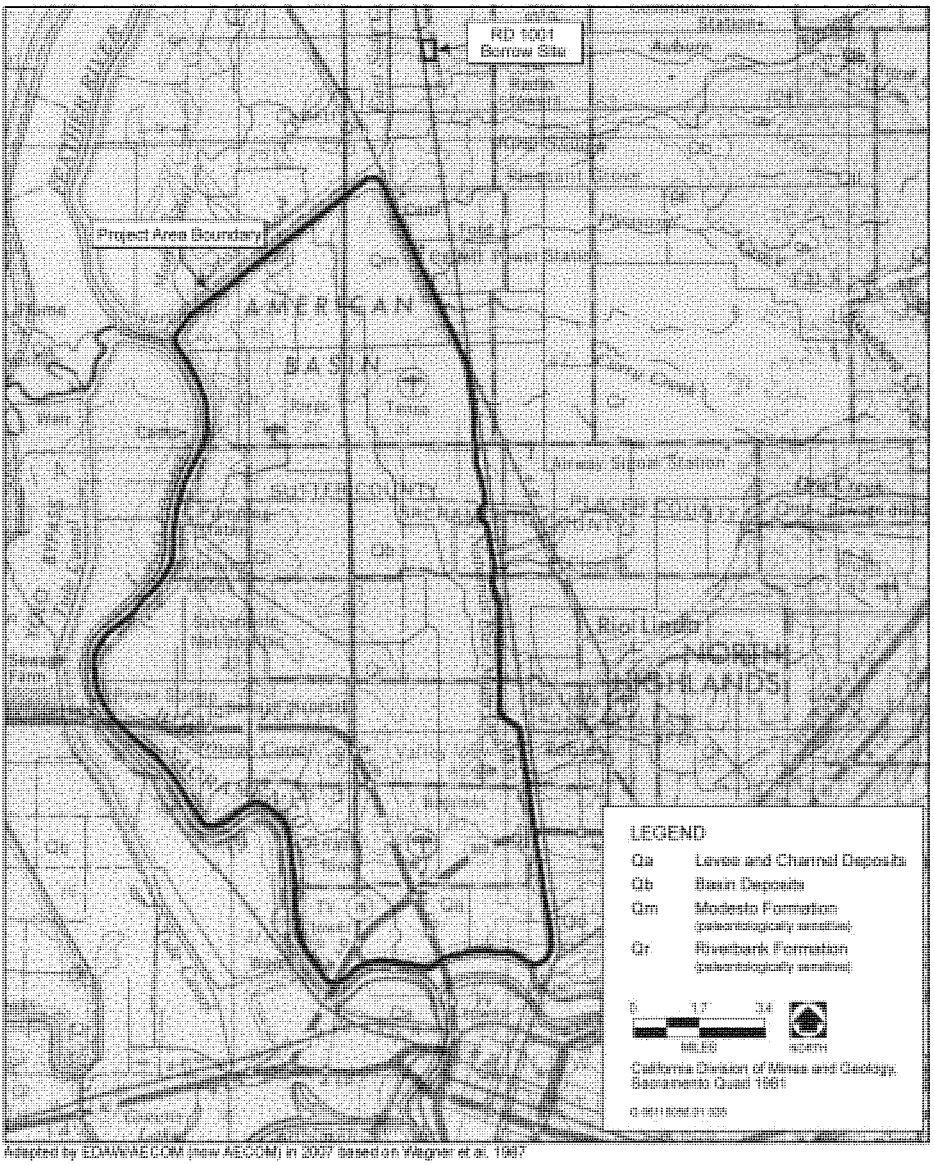
Field Survey

Field reconnaissance of the NLIP area was conducted by EDAW/AECOM (now AECOM) and began in July 2006 to document the presence of any previously unrecorded fossil sites and of strata that might contain fossil remains. The surface topography was nearly flat, and no exposed road cuts or other escarpments were noted where fossils in the Riverbank or Modesto Formations could be exposed. No fossils were observed in the area surveyed, including the Phase 2 and 3 Project areas. Phase 4a and 4b Project surveys are on-going.

3.9.2.2 PALEONTOLOGICAL RESOURCE ASSESSMENT

Holocene Alluvium

By definition, to be considered a fossil, an object must be more than 11,000 years old; therefore, project-related activities in the Holocene alluvium would have no effect on paleontological resources.



Adapted by EDAW/AECOM (now AECOM) in 2007 based on Wagner et al. 1987

Rock Formations in the Project Area **Plate 3-5**

Modesto and Riverbank Formations

Surveys of late Cenozoic land mammal fossils in northern California have been provided by Hay (1927), Lundelius et al. (1983), Jefferson (1991a, 1991b), Savage (1951), and Stirton (1939). On the basis of his survey of vertebrate fauna from the nonmarine late Cenozoic deposits of the San Francisco Bay region, Savage (1951) concluded that two major divisions of Pleistocene-age fossils could be recognized: the Irvingtonian (older Pleistocene fauna) and the Rancholabrean (younger Pleistocene and Holocene fauna). These two divisions of Quaternary Cenozoic vertebrate fossils are widely recognized today in the field of paleontology. The age of the later Pleistocene, Rancholabrean fauna was based on the presence of bison and on the presence of many mammalian species that are inhabitants of the same area today. In addition to bison, larger land mammals identified as part of the Rancholabrean fauna include mammoths, mastodons, camels, horses, and ground sloths.

The closest vertebrate fossils to the project area were recovered from the Arco Arena site (Hilton et al. 2000), located within the Natomas Basin, approximately 2.3 miles to the west of Pumping Plant No. 8 , in sediments of the Riverbank Formation. Fossils recovered from this site include Harlan's ground sloth, bison, coyote, horse, camel, squirrel, antelope, mammoth, and several plant specimens.

University of California Museum of Paleontology (UCMP) locality V-6426, approximately 16 miles north of the Natomas Basin near Gilsizer Slough, is located in sediments referable to the Modesto Formation. This site yielded a vertebra from a Pleistocene (Irvingtonian) age Proboscidea, an order that includes mammoths, mastodons, and elephants. UCMP locality V-3915 on Oswald Road, approximately 18 miles northwest of the Natomas Basin, yielded remains from a Pleistocene-age bison in sediments referable to the Modesto Formation. UCMP locality V-4043 in the Sutter Buttes, approximately 22 miles north of the levee, yielded remains from a Pleistocene-age horse in sediments referable to the Riverbank Formation.

Fossil specimens from the Modesto Formation have been reported by Marchand and Allwardt (1981) near the type locality in the city of Modesto. These authors also reported fossil specimens from the Riverbank Formation near its type locality in the city of Riverbank. Other locations are also known throughout the northern and Central Valley (UCMP 2006). For example, there are several sites approximately 10–20 miles from the Natomas Basin in Yolo County, near the cities of Davis and Woodland, which have yielded Rancholabrean-age rodents, snakes, horses, antelope, Harlan's ground sloth, mammoth, and saber-toothed tiger from sediments referable to both the Modesto and Riverbank Formations (Hay 1927, UCMP 2006).

There are at least eight additional recorded Rancholabrean-age vertebrate fossils sites from the Riverbank Formation in the city of Sacramento, southeast of the Natomas Basin (UCMP 2006, Kolber 2004). These sites have yielded remains of mammoth, bison, horse, and several types of reptiles.

Other than the vertebrate fossils recovered from the Arco Arena site, results of a paleontological records search at the UCMP indicated no fossil remains elsewhere in the Natomas Basin or within the Phase 4b Project area, and no fossils were observed during a cursory field visit. However, the occurrence of Pleistocene vertebrate fossil remains in sediments referable to the Modesto and Riverbank Formations from Sacramento; Yuba City and the town of Sutter in Sutter County; and Davis, Woodland, and numerous other areas throughout the Sacramento and San Joaquin Valleys, suggests there is a potential for uncovering additional similar fossil remains during construction-related earthmoving activities within the NLIP and Phase 4b Project area.

3.10 TRANSPORTATION AND CIRCULATION

3.10.1 REGULATORY SETTING

3.10.1.1 FEDERAL

There are no Federal laws, regulations, policies, or ordinances related to transportation and circulation that are relevant to the NLIP, including the Phase 4b Project.

3.10.1.2 STATE

Federal highway standards are implemented in California by the California Department of Transportation (Caltrans), which is responsible for planning, designing, constructing, operating, and maintaining all state-owned roadways in the Natomas Basin. Caltrans enforces various policies and regulations related to the modification of, or encroachment on, state-owned roadways. State-owned roadways within the NLIP, including the Phase 4b Project, area consist of SR 99, I-5, and I-80.

3.10.1.3 REGIONAL AND LOCAL

The public works departments of Sutter County, Sacramento County, and the City of Sacramento are responsible for planning, designing, constructing, operating, and maintaining all the roadways in the Natomas Basin that are owned by these respective jurisdictions. Encroachments in county or city road rights-of-way are subject to encroachment permits and the provision of temporary traffic control systems as required by the respective public works departments. With the exception of SR 99, I-5, and I-80, roadways within the Natomas Basin are under the jurisdiction of their respective county, or under the jurisdiction of the City of Sacramento.

Sutter County General Plan

The Transportation and Circulation Element of the *Sutter County General Plan* includes the following policy that may be relevant to the NLIP, including the Phase 4b Project:

- **Policy 2.A-6:** The County shall require all new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase.

Sacramento County General Plan

There are no *Sacramento County General Plan* goals or policies related to transportation and circulation that are relevant to the NLIP, including the Phase 4b Project.

Sacramento County Bikeway Master Plan

Sacramento County's *The 2010 Sacramento City/County Bikeway Master Plan* documents existing and proposed bicycle facilities.

City of Sacramento General Plan

The Mobility Element of the *City of Sacramento 2030 General Plan* (City of Sacramento 2009) includes the following policies that may be relevant to the NLIP, including the Phase 4b Project:

- **Policy M 1.1.3. Emergency Services:** The City shall coordinate the development and maintenance of all transportation facilities with emergency service providers to ensure continued emergency service operation and service levels.

- **Policy M 4.2.1 Adequate Rights-of-Way:** The City shall ensure that all new roadway projects and major reconstruction projects provide appropriate and adequate rights-of-way for all users including bicyclists, pedestrians, transit riders, and motorists except where pedestrians and bicyclists are prohibited by law from using a given facility.

- **Policy M 5.1.2 Appropriate Bikeway Facilities:** The City shall provide bikeway facilities that are appropriate to the street classifications and type, traffic volume, and speed on all right-of-ways.

- **Policy M 5.1.9 Conversion of Underused Facilities:** The City shall convert underused rights-of-way along travel lanes, drainage canals, and railroad corridors to bikeways wherever possible and desirable.

3.10.2 ENVIRONMENTAL SETTING

The roadways in the Natomas Basin, including the Phase 4b Project area, are described in **Table 3.10-1** and shown in **Plate 2-6**.

All the roadways north of I-5 in the vicinity of the levee improvement sites and borrow areas are rural two-lane roads with low traffic volumes. South of I-5 and Del Paso Road, nearer to and within the city of Sacramento, the roadways are mostly urban two- to four-lane roads and have higher traffic volumes. Data on traffic volumes are not available for all of the roadways listed in **Table 3.10-1**. The use of some of these roadways can also be characterized in terms of level of service (LOS). LOS is a qualitative description of operation of a roadway segment based on delay and maneuverability. LOS is often calculated by county or city agencies, depending on jurisdiction that manage congestion. LOS can range from "A," representing free-flow conditions, to "F," representing gridlock **(Table 3.10-2)**.

The *Sutter County General Plan Background Report* (Sutter County 1996b) contains the most recent traffic count and LOS data for roadways in the northern part of the Natomas Basin. In the general plan background report, Garden Highway between Sankey Road and Riego Road was rated LOS A, with an average daily traffic (ADT) volume of 340. SR 99 was rated LOS C with an ADT volume of 22,000. Riego Road was rated at LOS A with an ADT volume of 540, and Sankey Road was rated LOS A with an ADT volume of 440. LOS data were not available for the Natomas Basin portion of unincorporated Sacramento County. However, given that similar land uses exist south of the Sutter County line and west of SR 99, traffic volumes and conditions are expected to be similar.

The most recent annual traffic counts performed for select roadways by Sacramento County Department of Transportation (August 17 and 18, 2006) show the average daily traffic volume on Powerline Road north of Elverta Road to be between 250 and 270 in each direction (Sacramento County 2007a). Data on other Sacramento County roads in the NLIP area are not available.

City of Sacramento traffic count data (City of Sacramento 2005) indicate an average one-way ADT of 381 on San Juan Road between El Centro Road and Garden Highway (April 2003 data). The *City of Sacramento General Plan Background Report* (City of Sacramento 2005) and the July 2006 draft environmental impact report for the Greenbriar Development Project (City of Sacramento and Sacramento Local Agency Formation Commission [LAFCo] 2006) contain LOS data for roadways for the portions of the southern Natomas Basin that are within Sacramento's city limits and sphere of influence. The City of Sacramento regards LOS C as unacceptable. Elkhorn Boulevard west of the SR 99 interchange operates at LOS A and east of SR 99 operates at LOS D. San Juan Road, West El Camino Avenue, and Garden Highway west of I-5 are shown as operating at LOS A through LOS C, depending on time of day. East of Truxel Road (which becomes Natomas Boulevard), West El Camino Avenue operates at LOS E and San Juan Road operates at LOS D. Northgate Boulevard in South Natomas operates at LOS A through C. North Natomas segments located north of North Market Boulevard operate at LOS E. Segments of I-80, I-5, and SR 99 operate at LOS D or below during commute hours, with heavy traffic

Table 3.10-1
Natomas Basin Roadway Network

Roadways	Description
SR 99	SR 99 is a primary regional transportation corridor within Sutter County and supports north-south regional travel. SR 99 extends from I-5 in the Phase 4b Project area north through Sacramento and Sutter Counties to the Butte County line. The roadway has two to four lanes over its length and provides regional access to the Sacramento metropolitan area in the south and the cities of Gridley and Chico in the north.
I-5	I-5 is a primary regional transportation corridor within Sacramento County, providing connection between the city and county of Sacramento and Yolo County. It provides primary access to the Airport just west of Powerline Road.
I-80	I-80 is a primary regional transportation corridor within the city and county of Sacramento, intersecting I-5 just south of San Juan Road.
Garden Highway	Garden Highway is a north-south and east-west two-lane roadway that extends north from the Sacramento city limits along the Sacramento River to Yuba City. Garden Highway is a two- to four-lane east-west roadway within the city of Sacramento in South Natomas. The roadway also serves as an alternative north-south route to SR 99. It provides primary access for residences and businesses along the waterside of the Sacramento River east levee, and to landside residents in businesses between I-80 and Northgate Boulevard. Bicyclists also use Garden Highway for recreation and commuting.
Howsley Road	Howsley Road is an east-west two-lane roadway that intersects SR 99 at the NCC. It crosses the PGCC and connects with Pleasant Grove Road just west of the Sutter-Placer County line.
Fifield Road	Fifield Road is an east-west two-lane roadway that intersects Natomas Road at the PGCC. It crosses the PGCC and connects with Pleasant Grove Road just west of the Sutter-Placer County line.
Keys Road	Keys Road is an east-west two-lane roadway that intersects Natomas Road at the PGCC. It crosses the PGCC and connects with Pleasant Grove Road just west of the Sutter-Placer County line.
Natomas Road	Natomas Road is a north-south two-lane roadway on top of the west levee of the PGCC in Sutter County. It extends south from Howsley Road and becomes East Levee Road between Riego Road and West Elverta Road.
Pacific Avenue	Pacific Avenue is a north-south two-lane roadway that extends from Striplin Road to Howsley Road in Sutter County.
Powerline Road	Powerline Road is a north-south two-lane roadway that parallels SR 99, providing an alternate north-south route to Garden Highway and SR 99 from Sankey Road in Sutter County to Garden Highway in Sacramento County.
Riego Road	Riego Road is an east-west two-lane roadway extending from Garden Highway in Sutter County to Base Line Road in Placer County.
Sankey Road	Sankey Road is an east-west two-lane roadway in Sutter County that extends from Garden Highway east across SR 99.
Striplin Road	Striplin Road is an east-west two-lane roadway that extends from Garwood Road to Pacific Avenue in Sutter County.
West Elverta Road	West Elverta Road is an east-west two-lane roadway in Sacramento County at the north-south midpoint of the Natomas Basin that extends from Garden Highway east across SR 99.
Elkhorn Boulevard	Elkhorn Boulevard is an east-west two-lane roadway in Sacramento County between Powerline Road and SR 99 and extending into the city of Sacramento to the East Levee Road on the NEMDC.
West Elkhorn Boulevard	West Elkhorn Boulevard is an east-west two-lane roadway in Sacramento County that extends from Garden Highway to west of the Airport.
Del Paso Road	Del Paso Road is an east-west two- to four-lane roadway that extends eastward across the Basin from Powerline Road in Sacramento County across I-5 to the NEMDC in the city of Sacramento.

Table 3.10-1
Natomas Basin Roadway Network

Roadways	Description
Radio Road	Radio Road is an east-west two-lane roadway that connects Garden Highway to El Centro Road in Sacramento County.
San Juan Road	San Juan Road is an east-west two- to four-lane roadway that connects Garden Highway in Sacramento County to I-5 and the city of Sacramento.
Bryte Bend Road	Bryte Bend Road is a north-south two-lane rural roadway connecting Garden Highway west of I-80 in Sacramento County to San Juan Road.
El Centro Road	El Centro Road is a north-south two- to four-lane roadway in Sacramento County and the city of Sacramento that extends south from Del Paso Road to West El Camino Avenue.
West El Camino Avenue	West El Camino Avenue is an east-west four-lane roadway in the city of Sacramento that connects I-5 with El Centro Road. Continuing to the east, it intersects with Northgate Boulevard and continues to the east to cross the NEMDC.
Northgate Boulevard	Northgate Boulevard is a north-south four-lane road in the city of Sacramento connecting Garden Highway in South Natomas to Del Paso Road in North Natomas.
Gateway Oaks Drive	Gateway Oaks Drive is a north/-south four-lane road west of I-5 in the city of Sacramento connecting Garden Highway in South Natomas to West El Camino Avenue.
Truxel Road	Truxel Road is a north-south four-lane roadway east of I-5 in the city of Sacramento connecting Garden Highway to West El Camino Avenue and San Juan Road.
Arden Garden Connector	Arden-Garden Connector is an east-west four-lane roadway east of I-5 in the city of Sacramento connecting Garden Highway to Northgate Boulevard.

Notes: I-5 = Interstate 5; I-80 = Interstate 80; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; SR = State Route
Source: Data compiled by AECOM in 2009

Table 3.10-2
Level of Service Descriptions

LOS	Description
A	Free-flow travel with an excellent level of comfort and convenience and the freedom to maneuver.
B	Stable operating conditions, but the presence of other road users causes a noticeable, though slight, reduction in comfort, convenience, and maneuvering freedom.
C	Stable operating conditions, but the operation of individual users is substantially affected by the interaction with others in the traffic stream.
D	High-density but stable flow.
E	Operating conditions at or near capacity. Speeds are reduced to a low but relatively uniform value. Freedom to maneuver is difficult with users experiencing frustration and poor comfort and convenience. Unstable operation is frequent, and minor disturbances in traffic flow can cause breakdown conditions. Severe restriction in speed and freedom to maneuver, with poor levels of comfort and convenience.
F	Breakdown conditions. These conditions exist wherever the volume of traffic exceeds the capacity of the roadway. Long queues can form behind these bottleneck points with queued traffic traveling in a stop-and-go fashion.

Source: City of Sacramento 2005

occurring during the morning hours in the direction of job centers (e.g., downtown Sacramento) and in the afternoon/evening hours in the opposite direction.

According to the *Draft Environmental Impact Report for the Sacramento International Airport Master Plan* (Sacramento County 2007b), I-5 between Airport Boulevard in Sacramento County and County Road 22 on the Yolo County side of the Sacramento River operates at LOS B or C in both directions during peak hours.

Traffic counts conducted for Natomas Unified School District in January 2009 for the proposed West Lakeside High School Project indicated that Del Paso Road carried an ADT volume of 6,530 vehicles per day between Broadgate Drive and El Centro Road. Preliminary traffic studies prepared for Natomas Unified School District indicate that El Centro Road currently carries an ADT volume of 5,150 south of Del Paso Road.

3.11 AIR QUALITY

3.11.1 REGULATORY SETTING

3.11.1.1 FEDERAL

The following Federal law related to air quality is relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Clean Air Act of 1963, as Amended.

3.11.1.2 STATE

California Clean Air Act

The California Air Resources Board (ARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS) (**Table 3.11-1**). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases, the CAAQS are more stringent than the National Ambient Air Quality Standards (NAAQS). Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

Other ARB responsibilities include:

- overseeing local air district compliance with California and Federal laws;
- approving local air quality attainment plans (AQAPs);
- submitting State Implementation Plans (SIPs) to EPA;
- monitoring air quality;
- determining and updating area designations and maps; and

- setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

The ambient air quality standards and attainment status designations for Sutter and Sacramento Counties are listed below in **Table 3.11-2**. Various activities necessary for implementation of the NLIP, including the Phase 4b Project, such as use of on- and off-road vehicles and heavy-duty diesel equipment, would produce emissions regulated under ARB.

California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide greenhouse gas (GHG) emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. In addition, AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. AB 1493, established in July 2002, aims to regulate vehicular GHG emissions through manufacturer specifications and enhanced reporting and certification requirements for GHG emissions reductions. AB 32 includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions. ARB is currently in the drafting process for development of a preliminary California Cap and Trade Program and plans to complete the draft process by October 2010, in line with the proposed AB 32 schedule.

The contribution of GHG emissions related to the NLIP, including the Phase 4b Project, is discussed in Section 5.1.8, "Project Impacts that Could Be Cumulatively Considerable."

3.11.1.3 Regional and Local

Project construction activities would take place in both Sutter and Sacramento Counties. The Feather River Air Quality Management District (FRAQMD) manages air quality conditions and regulations in Sutter County, and the Sacramento Metropolitan Air Quality Management District (SMAQMD) has jurisdiction over air quality considerations in Sacramento County. The local air quality management districts (AQMDs) are the regulatory agencies responsible for attaining and maintaining air quality conditions in the counties affected by projects through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. AQMDs implement clean-air strategies including preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The AQMDs also inspect stationary sources, respond to citizen complaints, monitor ambient air quality and meteorological conditions, and implement other programs and regulations required by the Federal Clean Air Act (CAA), Federal Clean Air Act Amendments of 1990 (CAAA), and the CCAA.

In efforts to achieve the NAAQS and CAAQS and maintain healthful air quality throughout the air basin, the local AQMDs have jointly prepared and adopted AQAPs and reports. The CCAA requires air districts to provide triennial reports detailing the status and progress of measures described in the AQAP. The most recent AQAP, completed in 2003 and adopted in 2005, addresses:

- air quality modeling to identify the reductions needed and design effective strategies for reducing emissions,
- comprehensive programs for reducing emissions that take advantage of zero- and near-zero-emission technologies, and
- impacts of pollutant transport in the attainment demonstration.

The AQMDs also publish CEQA guidance documents and recently have provided CEQA planning guidance on their respective Web sites to assist with identification of significant adverse air quality impacts. They suggest strategies for reducing potential project emissions early in the planning process. Because stationary sources such as industrial facilities are largely regulated, the guidelines focus on transportation and land use control measures to reduce emissions to achieve and maintain Federal and state health-based air quality standards.

All projects are subject to AQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the NLIP, including the Phase 4b Project, may include rules pertaining to, but not limited to, visible emissions, fugitive dust, architectural coatings, and general permit requirements.

3.11.2 Environmental Setting

3.11.2.1 Overview

The Natomas Basin, including the Phase 4b Project area, is located within the southern portion of the Sacramento Valley Air Basin, which comprises all of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba Counties; the western portion of Placer County; and the eastern portion of Solano County. Air quality within the Phase 4b Project area and the remainder of the Natomas Basin is regulated by the EPA, ARB, FRAQMD, and SMAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent than EPA regulations.

3.11.2.2 Criteria Air Pollutants

Ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead are the most prevalent air pollutants known to be deleterious to human health. These pollutants are commonly referred to as "criteria air pollutants." Ozone, typically associated with poor air quality, is not emitted directly into the air, but is formed through a series of chemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. Motor vehicles and stationary industrial sources are major sources of emissions of both ROG and NO_X, which are also referred to as ozone precursors.

Air pollutant concentrations are measured at several monitoring stations in the Sacramento Valley Air Basin. The Sacramento–3801 Airport Road station is the closest monitoring station to the levee improvement sites with data to meet EPA and ARB criteria for quality assurance for all criteria pollutants, except for fine particulate matter ($PM_{2.5}$). The Yuba City air quality monitoring station on Almond Street is the closest monitoring station with $PM_{2.5}$ data. In general, the ambient air quality measurements from these monitoring stations are representative of the air quality in the Natomas Basin, including the Phase 4b Project area.

Table 3.11-1 summarizes the air quality data from these two monitoring stations for the latest 3 years for which data are available, 2006–2008. Both ARB and EPA use the type of monitoring data provided in **Table 3.11-1** to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." The "unclassified" designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called "nonattainment-transitional." The nonattainment-transitional designation is

given to nonattainment areas that are progressing and nearing attainment. **Table 3.11-2** summarizes the attainment status for criteria air pollutants for Sutter and Sacramento Counties.

Table 3.11-1
Summary of Annual Air Quality Data (2006—2008)

	2006	2007	2008
Sacramento–3801 Airport Road			
Ozone			
State standard (1-hour/8-hour average, 0.09/0.07 ppm)			
National standard (8-hour avg., 0.08 ppm)			
Maximum concentration (1-hour/8-hour average, ppm)	0.105/0.086	0.119/0.102	0.109/0.093
Number of days state standard exceeded	5/13	2/8	8/15
Number of days national 8-hour standard exceeded	5	4	9
Respirable Particulate Matter (PM_{10})			
State standard (24-hour average, 50 $\mu g/m^3$)			
National standard (24-hour average, 150 $\mu g/m^3$)			
Maximum concentration ($\mu g/m^3$)	84.0	98.0	71.0
Number of days state standard exceeded	4	6	3
Number of days national standard exceeded	0	0	N/A
Nitrogen Dioxide (NO_2)			
State standard (1-hour average, 0.18 ppm)			
National standard (annual, 0.053 ppm)			
Maximum concentration ($\mu g/m^3$) (1-hour average, ppm)	0.072	0.064	0.069
Number of days state standard exceeded	0	0	0
Carbon Monoxide (CO)			
State standard (1-hour/8-hour average, 20/9.1 ppm)			
National standard (1-hour/8-hour average, 35/9.5 ppm)			
Maximum concentration (1-hour/8-hour average, ppm)	4.70/3.15	6.30/5.58	N/A /1.83
Number of days state standard exceeded	0	0	0
Number of days national 1-hour/8-hour standard exceeded	0/0	0/0	N/A /0
Yuba City–Almond Street Monitoring Station			
Fine Particulate Matter ($PM_{2.5}$)			
No separate state standard			
National standard (24-hour average, 35 $\mu g/m^3$)			
Maximum concentration ($\mu g/m^3$)	51.6	55.8	147.1
Number of days national standard exceeded	3	6	8

Notes: $\mu g/m^3$ = micrograms per cubic meter; NA = not available; ppm = parts per million by volume
Sources: ARB 2009a, EPA 2009

Table 3.11-2
Ambient Air Quality Standards and Attainment Status Designations for Sutter and Sacramento Counties

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Serious)	–	–	–
	8-hour	0.07 ppm[8] (137 µg/m^3)	Sutter: N Sacramento: N (Serious)	0.075 ppm (157 µg/m^3)	Same as Primary Standard	Sutter: N (Severe) Sacramento: N (Serious)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)[9]	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	A	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 µg/m^3)		–		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	–[10]	Same as Primary Standard	Sutter: U Sacramento: N (Moderate)
	24-hour	50 µg/m^3		150 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	Sutter: U Sacramento: N	15 µg/m^3	Same as Primary Standard	Sutter: N (Proposed) Sacramento: U/A
	24-hour	–		35 µg/m^3		
Lead	30-day Average	1.5 µg/m^3	A	–	–	A
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	

Table 3.11-2
Ambient Air Quality Standards and Attainment Status Designations for Sutter and Sacramento Counties

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Sulfates	24-hour	25 µg/m^3	A	**No National Standards**		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current Federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California Ambient Air Quality Standards (CAAQS) are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was promulgated (i.e., parts per million [ppm] or micrograms per cubic meter [µg/m^3]). Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

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

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

[7] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] This concentration effective May 17, 2006.

[9] The CAAQS were amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

[10] Because of a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM_{10} standard on September 21, 2006.

Source: ARB 2009b

3.11.2.3 NATURALLY OCCURRING ASBESTOS

Naturally occurring asbestos (NOA), which was identified as a toxic air contaminant in 1986 by the California Air Resources Board, is located in many parts of California and is commonly associated with ultramafic rocks (Clinkenbeard et al. 2002). Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Ultramafic rocks form in high-temperature environments well below the surface of the earth. By the time they are exposed at the surface by uplift and erosion, ultramafic rocks may be partially to completely altered to serpentinite, a type of metamorphic rock. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in the bodies of these rocks or along their boundaries (Churchill and Hill 2000).

For individuals in the vicinity of NOA, there are many potential pathways for airborne exposure. Exposures to soil dust containing asbestos can occur under a variety of scenarios, including dust raised from unpaved roads and driveways covered with crushed serpentine, uncontrolled quarry emissions, grading and construction, and other activities. People exposed to low levels of asbestos may be at elevated risk (e.g., above background rates) of lung cancer and mesothelioma. The risk is proportional to the cumulative inhaled dose (number of fibers), and also increases with the time since first exposure. Although there are a number of factors that influence the disease-causing potency of any given asbestos (such as fiber length and width, fiber type, and fiber chemistry), all forms are carcinogens.

The California Geological Survey (formerly the California Division of Mines and Geology) has prepared the *General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill and Hill 2000). Although geologic conditions are more likely for asbestos formation in or near these areas, the presence thereof is not certain. According to this guide, and the report *Relative Likelihood for the Presence of Naturally Occurring Asbestos in Eastern Sacramento County, California* (Higgins 2006), the project site is located in an area that is least likely to contain NOA. Based on the distant locations of NOA locations from the project site, the potential for NOA at concentration levels above acceptable limits is low in the NLIP area.

In July 2001, ARB adopted an Airborne Toxics Control Measure (ATCM) for construction, grading, quarrying, and surface mining operations that regulates grading and excavation activities in areas of serpentine or ultramafic rocks. The probability for encountering NOA in the Natomas Basin, including the Phase 4b Project area, is low. If NOA were encountered, it would be handled in accordance with state regulations. Thus, the issue is not discussed further in this EIS/EIR.

3.11.2.4 AMBIENT AIR QUALITY STANDARDS

At the Federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the CAA, which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in **Table 3.11-2**, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, respirable particulate matter (PM_{10}), $PM_{2.5}$, CO, NO_2, SO_2, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The CAAA added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA reviews all SIPs to determine conformity with the mandates of the CAA and its amendments and to determine whether implementation of the SIPs will achieve air quality goals. If EPA determines that a SIP is inadequate, a Federal Implementation Plan that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable

SIP or to implement the plan within the mandated time frame may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin.

3.12 NOISE

3.12.1 REGULATORY SETTING

3.12.1.1 FEDERAL

There are no Federal laws, regulations, policies, or ordinances related to noise that are relevant to the NLIP, including the Phase 4b Project.

3.12.1.2 STATE

State of California General Plan Guidelines

The Governor's Office of Planning and Research (OPR) published the *State of California General Plan Guidelines* (OPR 2003), which provide guidance for the acceptability of projects within specific day-night average noise level (L_{dn}) contours. Generally, residential uses (e.g., mobile homes) are considered to be acceptable in areas where exterior noise levels do not exceed 60 A-weighted decibels (dBA) L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55–70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA L_{dn} and normally unacceptable in areas exceeding 70 dBA L_{dn}. Commercial uses are normally acceptable in areas with a community noise equivalent level (CNEL) of up to 70 dBA. Commercial uses are conditionally acceptable where the L_{dn} is between 67.5 and 77.5 dBA, depending on the noise insulation features and the noise reduction requirements. The OPR Guidelines also provide adjustment factors for determining noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. Many activities associated with the NLIP, including Phase 4b Project implementation, such as grading activities and use of heavy equipment, would result in noise levels above existing conditions.

California Code of Regulations, Title 24

Title 24 of the CCR establishes standards governing interior noise levels that apply to all new multi-family residential units in California. These standards require that acoustical studies be performed before construction begins at locations where the existing L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that limit maximum L_{dn} levels to 45 dBA in any habitable room. Although no generally applicable interior noise standards are pertinent to all uses, many communities in California have adopted an L_{dn} of 45 dBA as an upper limit on interior noise in all residential units.

3.12.1.3 REGIONAL AND LOCAL

Local Government Noise Standards

Sutter County

The *Sutter County General Plan* Noise Element has established noise standards for noise-sensitive land uses. The County has established an exterior noise level of 60 dBA L_{dn} and an interior noise level of 45 dBA L_{dn}. For non-transportation noise sources, the standards outlined in **Table 3.12-1** would apply. Sutter County does not contain any provisions that would exempt construction noise within the County; therefore, the standards shown in **Table 3.12-1** would also apply to construction noise.

Table 3.12-1
Local Government Non-transportation Noise Standards (dBA)

Noise Element Jurisdiction/ Land Use Category	Maximum Allowable Exterior Noise Levels					
	Daytime 7:00 a.m.–7:00 p.m.		Evening 7:00 p.m.–10:00 p.m.		Nighttime 10:00 p.m.–7:00 a.m.	
Sutter County	**Daytime Hourly**		**Evening Hourly**		**Nighttime Hourly**	
	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
	50	70	50	70	45	65
	Construction noise is not exempt from Sutter County noise standards during any hours of the day.					
Sacramento County Residential Areas	**Hourly**		**Hourly**		**Hourly**	
	L_{50}	L_{max}	L_{50}	L_{max}	L_{50}	L_{max}
	50	70	50	70	45	65
	Construction noise is exempt from the Sacramento County noise regulations provided that construction does not take place before 6:00 a.m. or after 8:00 p.m. Monday through Friday, and before 7:00 a.m. or after 8:00 p.m. on Saturday and Sunday.					
City of Sacramento Residential Areas	**Exterior Ldn/CNEL**			**Interior Ldn/CNEL**		
	60			45		
	Construction noise is exempt from the City of Sacramento noise regulations provided that construction does not take place before 7:00 a.m. or after 6:00 p.m. Monday through Saturday, and before 9:00 a.m. or after 6:00 p.m. on Sunday.					

Notes: dBA = A-weighted decibel; L_{50} = noise level exceeded 50% of the time; L_{max} = maximum noise level; L_{dn} = day-night average noise level; CNEL = community noise equivalent level; L_{eq} = energy-equivalent noise level
Source: City of Sacramento 2009, Sacramento County 1993, Sutter County 1996a

Sacramento County

The *Sacramento County General Plan* Noise Element states that noise created by new non-transportation noise sources may not exceed the standards outlined in **Table 3.12-1** when measured at the property line of the noise-sensitive land use.

The Sacramento County noise ordinance states that a standard of 55 dBA is applied during the hours of 7:00 a.m. and 10:00 p.m., and a standard of 50 dBA is applied during the hours of 10:00 p.m. and 7:00 a.m. for residential and agricultural uses. The noise ordinance also states that construction activities are exempt during the hours of 6:00 a.m. and 8:00 p.m. Monday through Friday and from 7:00 a.m. and 8:00 p.m. on Saturdays and Sundays (Chapter 6.68 Noise Control, County of Sacramento Code). The noise ordinance contains a provision that allows construction noise during non-exempt hours under certain circumstances; special condition permits can be issued by the County per the Sacramento County noise ordinance, which states:

> Notwithstanding any provision of this chapter, the County Health Officer may grant special condition permits for a period not exceeding three days when the general purpose and intent of this chapter can be carried out by the granting of the special condition permit. Said special condition permits may be renewed for periods not exceeding three days at the discretion of the health officer. (Chapter 6.68.190 Special Condition Permits, County of Sacramento Code.)

City of Sacramento

The *City of Sacramento General Plan* Noise Element establishes an exterior noise level of 60 dBA L_{dn} and an interior noise level of 45 dBA L_{dn} as acceptable.

The City's exterior noise standard, as stated in the City's noise ordinance, is 55 dBA during the hours of 7:00 a.m. to 10:00 p.m. for residential and agricultural uses. The standard then adjusts to 50 dBA between 10:00 p.m. and 7:00 a.m. for residential and agricultural uses. The noise ordinance also exempts construction noise during the hours of 7:00 a.m. and 6:00 p.m. Monday through Saturday and from 9:00 a.m. to 6:00 p.m. on Sundays. The ordinance further states that the operation of an internal combustion engine is not exempt if the engine is not equipped with suitable exhaust and intake silencers in good working order (8.68.080 Exemptions, Noise Control Standards, City of Sacramento Municipal Code).

General

Construction noise may affect sensitive receptors in unincorporated areas of Sutter and Sacramento Counties and in the City of Sacramento. These jurisdictions either have non-transportation noise standards based on time of day and land use sensitivity or provide exemptions for construction as long as those activities occur during the daytime. Residential areas are considered the most noise-sensitive land use, and the most restrictive noise standards apply.

Noise generated by a transportation source is also regulated according to land use. All the jurisdictions with standards for transportation noise impacts have adopted a normally acceptable L_{dn}/CNEL noise standard of 60 dBA for residential land uses and a conditionally acceptable L_{dn}/CNEL noise standard of 65 dBA, provided that the best available noise reduction measures have been applied. Many of the jurisdictions have adopted a maximum L_{dn}/CNEL noise limit of 70 dBA for playgrounds, parks, and riding stables.

For the purposes of this analysis, the local noise level standards presented above and in **Table 3.12-1** are applied to evaluate the impacts of noise generated by construction equipment, and the local noise level standards presented above are applied to evaluate the impacts of noise generated by construction-related truck trips.

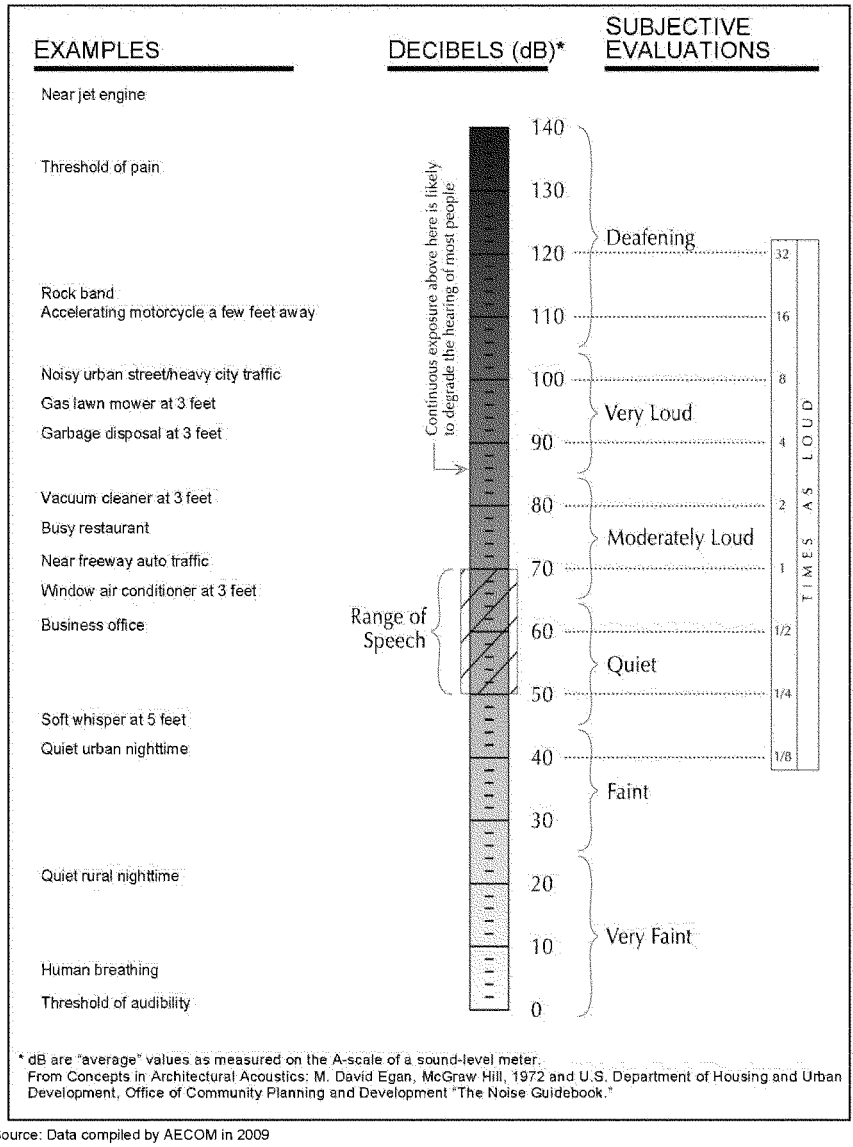
3.12.2 ENVIRONMENTAL SETTING

3.12.2.1 SOUND AND THE HUMAN EAR

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave caused by a disturbance or vibration. Because of the ability of the human ear to detect a wide range of sound pressure fluctuations, sound pressure levels are expressed in logarithmic units called decibels (dB). The sound pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure squared. The reference sound pressure is considered the absolute hearing threshold (Caltrans 1998: N-9).

Because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. A dBA scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been adopted by most authorities for the purpose of regulating environmental noise. Typical indoor and outdoor noise levels are presented in **Plate 3-6**.

Because the decibel scale is logarithmic, sound levels measured in decibels are not additive. For example, a 65-dBA source of sound, such as a truck, when joined by another 65-dBA source results in sound amplitude of 68 dBA, not 130 dBA (i.e., doubling the source strength increases the sound pressure by 3 dBA). Amplitude is



Source: Data compiled by AECOM in 2009

Typical Noise Levels **Plate 3-6**

interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10-dBA increase in amplitude with a perceived doubling of loudness and establish a 3-dBA change in amplitude as the minimum difference perceptible to the average person (Caltrans 1998: N-42).

3.12.2.2 SOUND PROPAGATION

As sound (or noise) propagates from the source to the receptor, the attenuation, or manner of noise reduction in relation to distance, depends on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse square law describes the attenuation caused by the pattern of sound traveling from the source to the receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA per doubling of distance. However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dBA per doubling of distance. The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Atmospheric conditions such as wind speed, temperature, and humidity may affect noise levels.

Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation depends on the barrier size and frequency of the noise. A noise barrier may be any natural or human-made feature such as a hill, tree, building, wall, or berm (Caltrans 1998: N-33).

3.12.2.3 NOISE DESCRIPTORS

The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (Caltrans 1998: N-44 through N-45, Lipscomb and Taylor 1978: 65–68).

- **L_{max} (Maximum Noise Level):** The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level."
- **L_{min} (Minimum Noise Level):** The minimum instantaneous noise level during a specific period of time.
- **L_X (Statistical Descriptor):** The noise level exceeded X% of a specific period of time. The L_{50} is the noise level exceeded 50% of the time, for example.
- **L_{eq} (Equivalent Noise Level):** The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}.
- **L_{dn} (Day-Night Noise Level):** The 24-hour L_{eq} with a 10-dBA "penalty" for the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In calculating the L_{dn}, 10 dBA is added to each noise event occurring in the nighttime hours, resulting in a higher reported sound level than would occur without the penalty. The L_{dn} is intended to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- **CNEL (Community Noise Equivalent Level):** Similar to the L_{dn} described above, but with an additional 5-dBA "penalty" for the noise-sensitive hours between 7:00 p.m. and 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If the same 24-hour noise data are used, the CNEL is typically approximately 0.5 dBA higher than the L_{dn}.

3.12.2.4 EXISTING NOISE CONDITIONS AND NOISE-SENSITIVE LAND USES IN THE PROJECT VICINITY

Noise-sensitive land uses in the NLIP, including the Phase 4b Project area, consist of waterside residential uses, landside rural residential/agricultural uses (Sacramento River east levee Reach A:16–19A, NEMDC west levee,

PGCC west levee, and NCC south levee), and an urban area (Sacramento River east levee Reach A:19A–20, American River north levee Reach I:1–4) (**Plates 2-7a–b**, **2-9**, **2-11**, **2-13**, and **2-14**). Some waterside and landside residences are located within 100 feet of construction areas. A subdivision is located within 1,000 feet of the eastern end of the South Fisherman's Lake Borrow Area north of San Juan Road. No noise-sensitive land uses are located in the vicinity of West Drainage Canal.

The primary noise sources in the area include vehicle traffic, Airport operations, agricultural activities, railroad operations, machinery and activities associated with commercial and industrial uses, miscellaneous sources within residential communities, and boating operations on the Sacramento River. Because the navigable channel is more than 1,000 feet from the American River north levee, boating operations on the American River is not considered a primary noise source within the Phase 4b Project footprint. The major highways/roadways in the area are I-5, I-80, SR 99, Garden Highway, Powerline Road, Riego Road, Elverta Road, Del Paso Road, San Juan Road, El Centro Road, West El Camino, Orchard Lane, Gateway Oaks Drive, Truxel Road, and Northgate Boulevard. The most substantial roadway traffic source within the area is vehicle traffic along the highways. Arterial roadways and stationary sources have a localized influence on the noise environment.

3.13 RECREATION

3.13.1 REGULATORY SETTING

3.13.1.1 FEDERAL

The following Federal law related to recreation is relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- National Wild and Scenic Rivers Act.

3.13.1.2 STATE

California Public Resources Code Sections 5400–5409, Public Park Preservation Act of 1971

Section 5401 states "(a) No city, city and county, county, public district, or agency of the state, including any division, department or agency of the state government, or public utility, shall acquire (by purchase, exchange, condemnation, or otherwise) any real property, which property is in use as a public park at the time of such acquisition, for the purpose of utilizing such property for any non-park purpose, unless the acquiring entity pays for transfers to the legislative body of the entity operating the park sufficient compensation or land, or both as required by the provisions of this chapter to enable the operating entity to replace the park land and facilities thereon."

Sections 5405(a) and (b) provide that compensation for public park land acquired shall be equal to either the cost of acquiring substitute park land or the direct substitution of "park land that is of comparable characteristics and of substantially equal size located in an area which would allow for use of the substitute park land by generally the same persons who used the existing park land, and the cost of acquiring substitute facilities of the same type and number, plus the cost of development of such substitute park land including the placing of such substitute facilities thereon."

California Wild and Scenic Rivers Act

The Lower American River is classified as a "Recreation" river within the Federal and state Wild and Scenic River Systems (California PRC Section 5093.50 et seq., and Public Law 90-542; 16 USC Section 1271 et seq.). The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition of the enjoyment of present and

future generations. Each river is administered by either a Federal or state agency. The managing agency for the Lower American River is the California Resources Agency (Caltrans 2009).

The Recreation classification applies to those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Each river is administered with the goal of protecting and enhancing the values that caused it to be designated. The intent of the Act is to balance dam and other construction at appropriate sections of rivers with permanent protection for some of the country's most outstanding free-flowing rivers. To accomplish this, the Act prohibits Federal support for actions such as the construction of dams or other instream activities that would harm the river's free-flowing condition, water quality, or outstanding resource values. However, designation does not affect existing water rights or the existing jurisdiction of states and the federal government over waters as determined by established law (National Wild and Scenic Rivers 2010).

3.13.1.3 REGIONAL AND LOCAL

Sutter County General Plan

The *Sutter County General Plan* is currently being updated; adoption of the new plan is anticipated in winter 2010 (Sutter County 2009). The Recreation and Cultural Resources Element of the current *Sutter County General Plan* (Sutter County 1993) addresses recreational areas and facilities, cultural resources, and customs/culture. Findings related to recreation include:

- **Finding 5a**: In-migration of new residents and historical growth patterns impact the supply and demand for recreation areas and facilities.
- **Finding 5b**: The County has an unmet demand for organized trails systems (foot, bike, equestrian).
- **Finding 5c**: Mechanisms to provide, operate, and maintain recreational facilities are needed in the County.
- **Goal 5.A**: To provide adequate park and open space areas for passive and active recreational, social, educational, and cultural opportunities for residents of Sutter County.
- **Policy 5.A-1**: The County shall strive to maintain and improve the distribution of local and regional parks to support the recreational needs of Sutter County residents.

The Park and Recreation Designation on the Sutter County General Plan diagram is intended to "identify and protect those mountainous, river bank, lake shore, or other such areas of particular natural beauty, historical importance, or other importance for use as public or private parks or outdoor recreational facilities." No areas of the NLIP project area in Sutter County are designated Park and Recreation.

Sacramento County American River Parkway Plan

The *American River Parkway Plan* is a policy document, adopted by Sacramento County in 2008, which provides guidelines for preservation, recreational use, development, and administration of the American River Parkway (Sacramento County 2008). Goals of the Plan include:

- To provide, protect, and enhance for public use a continuous open space greenbelt along the American River extending from the Sacramento River to Folsom Dam;
- To provide appropriate access and facilities so that present and future generations can enjoy the amenities and resources of the Parkway, which enhance the enjoyment of leisure activities;

- To preserve, protect, interpret, and improve the natural, archaeological, historical, and recreational resources of the Parkway, including an adequate flow of high-quality water, anadromous and resident fishes, migratory and resident wildlife, and diverse natural vegetation;
- To mitigate adverse effects of activities and facilities adjacent to the Parkway; and
- To provide public safety and protection within and adjacent to the Parkway.

Guiding policy concepts for management within the Parkway and relationship of the surrounding region to the Parkway are summarized below:

1.1 Balanced Management: Balanced management in order to provide for flood control, preserved and enhanced natural resources and wildlife, open space and environmental quality preservation, improved water quality and flow, habitat connectivity supporting migratory and resident wildlife, recreational opportunities, and public safety.

1.2 Recreation: Provide for recreational opportunities that are appropriate in a natural environment.

1.3 Resource Protection: Provide resource protection by preventing overuse of the Parkway.

1.4 Land Use: Control land uses and maintain the integrity of the Parkway boundaries in order to assure long-term protection of the Parkway.

1.5 Cooperation: Facilitate coordination and cooperation in Parkway planning among agencies with responsibilities within the Parkway.

2010 Sacramento City/County Bikeway Master Plan

The *2010 Sacramento City/County Bikeway Master Plan* (Bikeway Plan) (Sacramento County 1993) was adopted in 1993 by the County and in 1995 by the City. The Bikeway Plan is an effort to coordinate and develop a bikeway system that will serve the recreational and transportation needs of the public. The objectives of the Bikeway Plan are to:

1. **Coordination Objective:** Develop and maintain a coordinated approach by the City/County and other agencies to implement the plan as funding becomes available or as development occurs,
2. **Safety and Security Objective:** Achieve the highest possible level of safety and security for cyclists,
3. **Design Objective:** Provide adequate design consideration for bicycle facilities in all development plans and programs,
4. **Maintenance Objective:** Develop a comprehensive bikeway maintenance program, and
5. **Aesthetics Objective:** Develop a bikeway system which incorporates aesthetics and historical characteristics of the Sacramento area.

The Sacramento County Department of Transportation is in the process of updating the Sacramento County Bikeway Master Plan (Klinker, pers. comm., 2009).

City of Sacramento Parks and Recreation Master Plan 2005–2010

The *City of Sacramento Parks and Recreation Master Plan 2005–2010 Technical Update* was updated in April 2009 (City of Sacramento 2009a, Policies 4, 5, and 10). Relevant policies include the following:

- **Policy 10.1**: Enhance, restore, and protect existing natural resources including rivers, lakes/ponds, creeks, native vegetation, wildlife corridors, and sensitive habitats; ensure compatible park and recreation uses adjacent to natural resources.
- **Policy 10.7**: Encourage recreational access to the region's water corridors and explore the concept of a water trail connecting the various corridors.
- **Policy 10.8**: Participate in partnerships for the planning, protection, development, and enhancement of the American River, Sacramento River, and other water corridors and open space areas.
- **Policy 10.10**: Collaborate with other agencies to implement a comprehensive regional system of open space.
- **Policy 12.11**: Develop parks, trails, and other recreational amenities in a manner that is consistent with flood protection goals.
- **Policy 12.14**: Ensure that public parkland converted to non-recreational uses is replaced to serve the same community consistent with *California's Public Park Preservation Act of 1971*.
- **Policy 14.1**: Recognize Sacramento's regional role, develop, and implement an expanded vision and plan for a system of parks, recreation facilities, and programming, including "signature" destination attractions or facilities, e.g., large parks, unique venues, public art, special event, parkways, river/creek corridors, trials/bikeways, and open space areas.
- **Policy 14.3**: Establish formal partnerships throughout the region to promote shared programming, maintenance, and operations, as well as facility development and park acquisition.

3.13.2 ENVIRONMENTAL SETTING

The width and depth of the PGCC channel does not accommodate water-based recreation, and is therefore not considered a recreational resource. The PGCC west levee, which is owned by RD 1000, is used by the public for passive recreational activities such as walking and jogging. No recreational facilities are adjacent to the levee.

The Ueda Parkway is located on the NEMDC west levee extending north from the vicinity of the Arden-Garden Connector to Elkhorn Boulevard. The parkway integrates recreational trails within creek corridors in the northern area of Sacramento, including providing connections to the American River Parkway to the south of the NEMDC and the Dry Creek Parkway to the east of the NEMDC. The Ueda Parkway allows access to the natural habitat areas of Steelhead (NEMDC), Arcade, Dry, and Robla Creeks. A paved bike path exists on the levee crown of the NEMDC from Garden Highway to Sotnip Road, just north of Main Avenue.

In addition to the Ueda Parkway bike path mentioned above, designated Class I (off-street) bicycle facilities that currently exist in the area of the Phase 4b Project area are located within the American River Parkway at Discovery Park, and in linear parks in the residential areas in South Natomas. A Class I (off-street) and Class II (on-street) bicycle route exists on and adjacent to Garden Highway between Northgate Boulevard (American River north levee Reach I:4) and Gateway Oaks Drive (Sacramento River east levee Reach A:20), and is located on the landside of the Sacramento River east levee from Gateway Oaks Drive to the Natomas Main Drainage Canal, in Reach A:19B–20.

The Sacramento and American Rivers are popular locations for both water-related and land-based recreational activities. Recreational boating is one of the primary uses of the Sacramento and American Rivers in the vicinity of the Phase 4b Project area. The only access to Sacramento River marinas from the landside of the levee in the project area is from Garden Highway. There is a boat ramp at Discovery Park, which is accessed from Jibboom Street via Richards Boulevard from I-5. The navigable portion of the American River is more than 1,000 feet

from the Phase 4b Project area. People picnic and fish from the shoreline in limited areas along the Sacramento River in and near the Phase 4b Project area. A number of public parks and one private golf course are located in the Phase 4b Project area and in the adjacent areas of South Natomas. **Table 3.13-1** lists private and public marinas, city and county parks, and a golf course located in, and in the vicinity of, the Phase 4b Project area; **Plate 3-7** shows the locations of these parks and recreation facilities.

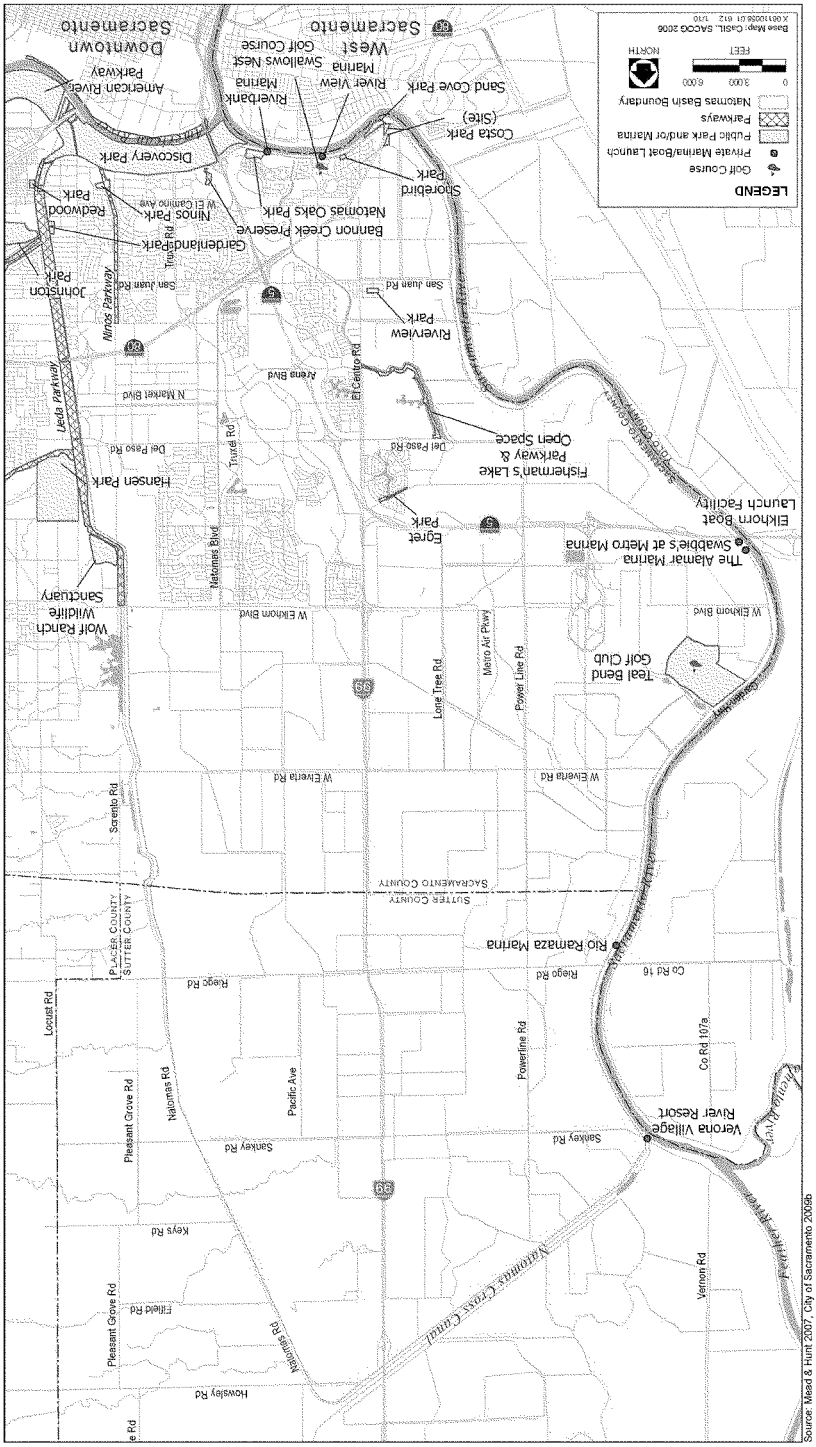
Table 3.13-1
Recreational Facilities and Park Lands in the Natomas Basin, including the Phase 4b Project Area

Facility (Owner/Operator)	Location	Features
Phase 1 Project Area		
No private or public recreation facilities are located within the Phase 1 Project area		
Phase 2 Project Area		
Rio Ramaza (private; open to the public)	10000 Garden Highway Sacramento River east levee, Reach C:4A	Boat ramp, marina, picnic area
Verona Village Marina and Resort (private; open to the public)	6995 Garden Highway Sacramento River east levee, Reach C:1	Marina, boat ramp, picnic area, RV campground
Phase 3 Project Area		
Alamar Marina (private; open to the public)	5999 Garden Highway Sacramento River east levee, Reach B:9B	Boat ramp, marina, picnic area, restaurant, pub
Elkhorn Boat Launch (Sacramento County)	Garden Highway at North Bayou Road Sacramento River east levee, Reach B:9B	Boat ramp and dock, picnic area
Swabbie's at Metro Marina (private; open to the public)	5871 Garden Highway Sacramento River east levee, Reach B:9B	Marina, picnic area, bar and grill
Teal Bend Golf Club (private; open to the public [membership])	7200 Garden Highway Sacramento River east levee, Reach B:6B	18-hole golf course, bar and grill
Phase 4a Project Area		
No private or public recreation facilities are located within the Phase 1 Project area		
Phase 4b Project Area		
Bannon Creek Nature Preserve (City of Sacramento Department of Parks and Recreation)	American River north levee, landside Reach I:2, south of West El Camino Boulevard	5.78-acre nature preserve
Costa Park Site (Park Site SN2) (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee, landside Reach A:19A, Garden Highway and I-80	3.3-acre undeveloped, planned neighborhood park
Discovery Park and American River Parkway (Sacramento County)	American River north levee (Reach I:1–4), riverside from the confluence of American and Sacramento Rivers upstream to Folsom Lake Recreation Area	Boat ramp (Discovery Park), picnic areas, and hiking and multi-use trails
Egret Park	5145 Westlake Parkway, immediately east of the West Lakeside school site and borrow area	9.64-acre park site with 4.65 acres of developed facilities, including a 0.35-mile bicycle trail, multi-use turf area, and lake
Fisherman's Lake Parkway and Open Space (City of Sacramento Department of Parks and Recreation)	Landside Natomas Central Drive at Po River Way	1.7-mile bikeway and open space
Garden Highway Bikeway	Reach I:1–2 of the American River north levee and Reach A:19a and 20 of the Sacramento River east levee. The Class I bikeway is adjacent to Garden Highway, on the waterside of the levees between Natomas Park Drive and Gateway Oaks Drive. The trail crosses Garden Highway, enters the Natomas Oaks Park, and continues parallel to the levee on the landside to the NEMDC. The bikeway	1.25-mile trail from Natomas Park Drive to Natomas Main Drainage Canal

Table 3.13-1
Recreational Facilities and Park Lands in the Natomas Basin, including the Phase 4b Project Area

Facility (Owner/Operator)	Location	Features
	turns north at this point and follows the NEMDC. See **Plate 2-21**, "Bike Trail Concepts"	
Gardenland Park (City of Sacramento Department of Parks and Recreation)	3010 Bowman Avenue in South Natomas, adjacent to the NEMDC west levee and Ueda Parkway	6-acre park with picnic facilities, ball field, volleyball and basketball courts, play areas, and restroom
Hansen Park (City of Sacramento Department of Parks and Recreation)	350 Kelton Way (east side of NEMDC, landside of east levee)	Nature area, bicycle trail, approximately 3.5 miles of equestrian trails in the area, which includes Dry Creek, Robla Creek, wetlands, and oak woodlands
Johnson Park (City of Sacramento Department of Parks and Recreation)	East side of NEMDC South, north of El Camino Avenue	26-acre softball field and parking
McClellan Docks (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee Reach A:20. On the Garden Highway waterside of the levee near the NEMDC	1.7-acre dock facility currently leased to the Drowning Accident Rescue Team (DART)
Natomas Oaks Park (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee Reach A:20 landside, 2101 Gateway Oaks Drive (intersection of Gateway Oaks Drive and Garden Highway)	13.2-acre park with oak grove, interpretative center picnic area, and parking area
Niños Parkway (City of Sacramento Department of Parks and Recreation)	American River north levee Reach I:4, linear parkway between West El Camino Avenue and Garden Highway	Soccer fields, volleyball courts, bikeway, picnic areas, and community garden
Redwood Park (City of Sacramento)	2415 Western Avenue (east side of NEMDC)	3.1-acre park with lighted softball field and parking
River View Marina (private; open to the public)	Sacramento River east levee Reach A:20, 1801 Garden Highway	Marina, restaurant, and dock
Riverbank Marina (private; open to the public)	Sacramento River east levee Reach A:20, 1371 Garden Highway #200	Marina, boat dock/landing, three restaurants, and 200 boatslips
Riverview Park	501 Forestara Circle (near intersection of El Centro and San Juan Roads)	5.19-acre developed park with playground, 0.2-mile walking path, picnic area, and shade structure
Sand Cove Park (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee, Reach A:19A (waterside), 2005 Garden Highway	10.3-acre park with boat dock/landing, paved walkways, trails, and picnic facilities
Shorebird Park (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee Reach A:19B, Kittiwake Drive and Swainson's Way on the landside of the Sacramento River east levee	2-acre developed park with play equipment, picnic area with shelter, turf, and volleyball court
Swallows Nest Country Club (private; open to members only)	Sacramento River east levee Reach A:19B (landside), 2245 Orchard Lane	Private nine-hole golf course associated with a 53-acre adult community and country club
Ueda Parkway (City of Sacramento Department of Parks and Recreation)	On the crown of NEMDC west levee between Arden Garden Connector and Elkhorn Boulevard, Dry Creek, and Robla Creek	12.5 miles of paved recreation trails primarily on levee crowns, providing access to the natural habitat of Steelhead, Arcade, Dry, and Robla Creeks. The parkway also has approximately 3.5 miles of equestrian trail in the Hansen Ranch area, which includes Dry Creek, Robla Creek, wetlands, and oak woodlands. Provides a connection to American River Parkway and downtown Sacramento, with neighborhood access points at various locations; facilities include a Class I bike trail along the crown of the NEMDC

Notes: I-5 = Interstate 5; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; RV = recreational vehicle
Source: Data compiled by AECOM in 2009 from City of Sacramento Department of Parks and Recreation 2009b and 2009c



Recreation Facilities **Plate 3-7**

3.14 VISUAL RESOURCES

3.14.1 REGULATORY SETTING

3.14.1.1 FEDERAL

There are no Federal laws, regulations, policies, or ordinances related to visual resources that are relevant to the NLIP, including the Phase 4b Project.

3.14.1.2 STATE

There are no state laws, regulations, policies, or ordinances related to visual resources that are relevant to the NLIP, including the Phase 4b Project.

3.14.1.3 REGIONAL AND LOCAL

American River Parkway Plan

The American River Parkway Plan is described in detail in Section 3.3.1.3, above. The following describes policies contained in the Parkway Plan that are relevant to visual resources.

Specific direction is provided in the policies of the Parkway Plan to encourage a positive relationship with adjacent land uses while still protecting the Parkway from visual impacts outside the Parkway (Sacramento County 2008:7-109). The Parkway Plan's land use policies regulate uses within the Parkway including the location and type of activities, as well as facilities and structures associated with those uses. For uses adjacent to the Parkway, the Parkway Plan provides policy guidance for jurisdictions regulating uses outside of the Parkway. The purpose of this policy guidance is to ensure that adjacent uses are sensitive to the Parkway's naturalistic setting and scenic values, protect the Parkway from negative visual impacts, and encourage a positive relationship with adjacent communities (Sacramento County 2008:7-111). Relevant policies include:

- **Policy 7.23:** Levees, landscaping, or other man-made or natural buffers should be used to separate, buffer or screen the Parkway visually form adjoining land uses, unless the adjacent land uses are indistinguishable from the Parkway.

Sutter County General Plan

The Land Use Element of the *Sutter County General Plan* (Sutter County 1996a) finds that "The visual quality of the natural and built environment contributes to the overall perception of a community." The Land Use Element contains the following visual and scenic resource goal that may be relevant to the project.

- **Goal 1.H:** To Preserve and protect the visual and scenic resources of the area.

Sacramento County General Plan

The *Sacramento County General Plan* is currently being updated (the DEIR was issued in spring 2009), but is not yet adopted. The Conservation Element of the existing *Sacramento County General Plan* (Sacramento County 1993) includes policies concerning native trees, flood channels, stream courses, and waterways. Policies CO-130 through CO-136, which apply to discretionary projects, are intended to conserve native oaks and other native tree species. To preserve the natural characteristics of these areas, policies in the Conservation Element call for maintenance of riparian vegetation, buffer zones adjacent to stream corridors that contain riparian vegetation, and unlined watercourses. Policy CO-107 requires that topographic diversity and variation be retained when channels are realigned or modified, including maintaining meandering characteristics, varied berm width, and naturalized

side slope. In addition, the Open Space Element contains general policies related to the protection of open space areas. Policy OS-1 calls for the permanent protection, as open space, of areas of natural resource value, including wetland preserves, riparian corridors, woodlands, and floodplains (Sacramento County 1993).
The Scenic Highways Element of the existing *Sacramento County General Plan* includes the objective to "take necessary steps to preserve and enhance the scenic qualities of the Garden Highway," and Garden Highway is designated a scenic corridor by the County. Policies included in the Scenic Highways Element encourage maintenance of natural roadside vegetation. (Sacramento County 1974.)

City of Sacramento General Plan

The *City of Sacramento 2030 General Plan* was adopted on March 3, 2009 (City of Sacramento 2009). The City has a program with USACE and SAFCA in which it works with these and other responsible agencies to resolve floodplain restrictions. The following policies from the Environmental Resources Element of the *City of Sacramento 2030 General Plan* may be relevant to this project.

- **Goal ER 7.1: Visual Resource Preservation.** Maintain and protect significant visual resources and aesthetics that define Sacramento.

- **Policy ER 7.1.1:** The City shall seek to protect views from public places to the Sacramento and American Rivers and adjacent greenways, landmarks, and urban views of the downtown skyline and the State Capitol along Capitol Mall.

3.14.2 Environmental Setting

The topography of the Natomas Basin is flat, with dominant landscape features formed by the levees associated with the Sacramento River on the west, the American River on the south, the NEMDC and PGCC on the east, and the NCC on the north. The landscape within the northern portion of the Natomas Basin is characterized by agricultural uses, mainly in the form of rice fields and other field crops. Ditches, irrigation pumps, and the occasional farm structure or farm house dot the landscape. The southern portion of the Basin is urbanized and dominated by the built environment, which is characterized by low-rise office buildings, apartment buildings, single-family homes, and roadways. I-5, I-80, and SR 99 are the major highways that cross the Basin. I-5 and I-80 intersect at the I-5/I-80 interchange in the southern portion of the Basin, which is elevated above the surrounding landscape. Within the Phase 4b Project area, the I-80 Bridge over the Sacramento River and the I-5 Bridge over the American River at Discovery Park are dominant features, along with the riparian vegetation growing along the levees of the Sacramento and American Rivers. Where very large, mature heritage oaks grow near Garden Highway, they often tower above all surrounding elements of the viewscape and are striking natural features both individually and as parts of overall views. Public parks and open space areas are located within the urbanized areas of North and South Natomas.

3.14.2.1 General Visual Character of the Natomas Basin

Land uses in the Natomas Basin vary from rural in the north to urban in the south, as described in detail in **Table 3-1**. The landscape of the western Basin is almost entirely flat; the only topographic variation consists of the levees and a few low rises where residences and agricultural buildings are located.

Airport facilities and arriving and departing aircraft are prominent features in the middle of the Basin and in broader views of the overall landscape, and these Airport-related features contrast with the otherwise rural character of the northern and middle portion of the Basin (approximately Reaches C:1–4B and B:5A–13). I-5, which rises from about 2,000 feet east of the levee to cross the Sacramento River to the west, is also a dominant feature in views of the levee area in Reach B:8–10. In Reach B:13–15, urban and industrial uses form background elements to views of the rural agricultural setting from the vicinity of the levee.

The following describes the visual character of the Phase 4b Project area.

3.14.2.2 SACRAMENTO RIVER EAST LEVEE

The visual environment of the Phase 4b Project area located along Reach A:16–18B of the Sacramento River east levee is characterized by scattered homes on large lots, interspersed with cultivated fields. A large wooded area is located on the landside of the levee in this area. The waterside of the levee in these reaches is dominated by a mature riparian forest, which is interspersed with single-family residences and private docks.

North of the Sacramento River east levee, in Reach A:19–20, the visual environment is dominated by the built features, which consist of residential subdivisions, office parks, and commercial developments with a few urban parks, linear parks, and natural open space preserves interspersed. The urbanized areas are characterized by low-rise (one- to three-story structures) offices, apartments, and single-family dwellings. Landscaping primarily consists of street trees, shrubs, and lawns. Ornamental and native trees and shrubs growing in the landside of the levee screen views of the levee slopes in some areas. Natomas Oaks Park, a 13.24-acre Heritage Oak preserve, is located on the landside of the levee in Reach A:20. The riparian forest on the waterside of the levee in these reaches is less dense than the upriver reaches and is more densely developed with single-family residences, private docks, restaurants, marinas, condominiums, and offices. Sand Cove Park, a public park, is located on the waterside of the levee in Reach A:19A.

The main viewer groups in this portion of the Phase 4b Project area are local residents living in the areas adjacent to the Sacramento River east levee; employees of businesses located near the Sacramento River east levee or along Garden Highway; travelers on Garden Highway, adjacent roadways, and on the I-80 Bridge; and recreational users of the Sacramento River and nearby parks and open space areas. Approximately 25 feet high on average, the existing levee blocks views of the Sacramento River from the adjacent landside areas; however, trees growing on and adjacent to the levees along the Sacramento River east levee are visible from the adjacent landside areas and provide an interesting visual backdrop to the views of the levees, and in some cases screen the lower portions of the levees.

Garden Highway, which is located on the crown of the Sacramento River east levee, is used by local residents, workers, recreational bicyclists, and by recreationists traveling to parks, private marinas, restaurants, and businesses in the area. Although the project site does not contain, nor is it visible from, a state-designated scenic highway, Garden Highway is a designated scenic corridor in Sacramento County. The Scenic Highways Element of the *Sacramento County General Plan* describes views from this roadway as consisting of wide expanses of rich farmland on the landside and intermittent views of the Sacramento River, through thick vegetation on the waterside of the Sacramento River east levee. The waterside of the Sacramento River east levee in the Phase 4b Project area is lined with residences and marinas situated among remnants of mature riparian woodland. The woodland consists mainly of oaks, cottonwoods, and ornamental trees associated with residences and businesses. Travelers along the length of Garden Highway have intermittent views of the Sacramento River through the trees and structures located on the waterside of the levee.

In addition to views of the Sacramento River, travelers along Garden Highway are likely to be visually drawn towards the flat, expansive predominantly agricultural views of the Natomas Basin and surrounding areas. As described in Section 3.8.2.2, "Historic Setting," ranching and agriculture have been prominent land uses in the Sacramento and Sutter County region since the mid-1800s. In addition, broad, open land used for agricultural purposes provides sweeping views of the Central Valley and, on clear days, surrounding topographic variation reaching to the Sierra Nevada Mountains to the east and the Coast range to the west. However, increased development in the Natomas Basin and surrounding region has resulted in a decrease in the availability of these agricultural views, which are generally considered to be typical of California's Central Valley.

Recreational users of the Sacramento River have a view of the waterside of the Sacramento River east levee with stands of riparian vegetation partially blocking the levee and waterside structures. Views of the interior of the

Natomas Basin from the Sacramento River channel are blocked by the levee, waterside structures, and waterside trees. Views of the river corridor itself are distinctive and moderately vivid, with the tree-lined river channel and dense riparian growth forming striking and harmonious visual elements. However, the riparian growth is interrupted throughout the length of the Phase 4b Project area by structures, docks, and adjacent parking areas, and by waterside commercial establishments. Overall, area views are of moderate aesthetic value.

3.14.2.3 AMERICAN RIVER NORTH LEVEE

The visual environment of the Phase 4b Project area located along the American River north levee Reach I:1–4 is characterized by medium- to low-density urban development north of the levee and riparian forest, open space, and parks to the south of the levee in the American River floodplain. The built environment consists of low-rise office parks in the vicinity of the Garden Highway/I-5 interchange and apartment complexes and single-family residential subdivisions east of Truxel Road. Public parks on the landside of the levee include Bannon Creek Preserve, a 5.78-acre nature preserve, and Niños Parkway, a linear park and community garden. Residential and office areas have ornamental landscaping—consisting of street trees, shrubs, and lawns—that soften views of the built environment. In some areas, landscaping that grows adjacent to the landside of the levee screens views of the levee slopes.

The main viewer groups in this portion of the Phase 4b Project area consist of local residents living in the areas adjacent to the American River north levee, travelers on Garden Highway and the I-5 Bridge, and recreational users of the adjacent parks on the landside of the levee and of the American River Parkway to the south of the levee. Approximately 25 feet high on average, the existing levee blocks views of the American River from the adjacent landside areas; however, trees growing on and adjacent to the levees along the American River north levee are visible from the adjacent landside areas and soften the appearance of the levee.

Garden Highway is used by local residents, workers, and recreationists. The waterside of American River north levee is lined with mature riparian woodland. The woodland consists mainly of oaks, cottonwoods, and other native riparian species. Views of the American River and its adjacent floodplain are blocked by the dense woodland for travelers along Garden Highway, which is located on the levee crown.

The waterside of the American River north levee is not visible to boaters and other recreationists using the American River or the American River Parkway recreation facilities. The main, navigable channel of the river is over 0.25 mile from the levee, and the intervening floodplain and waterside of the levee is densely vegetated. Views of the river corridor itself as viewed from within the floodplain or from the I-5 Bridge are distinctive and moderately vivid, with the dense riparian growth forming striking and harmonious visual elements.

3.14.2.4 PLEASANT GROVE CREEK CANAL WEST LEVEE, NATOMAS CROSS CANAL, AND NATOMAS EAST MAIN DRAINAGE CANAL WEST LEVEE

The areas along the PGCC west levee, the NCC south levee, and the NEMDC North are surrounded by agricultural lands. These areas are almost entirely flat, and few trees grow on the landscape except those along the channels (i.e., on the waterside of the levees), in widely spaced woodland areas along the landside of the levee, and near rural residences. Views of these areas lack vividness, but the visual components of the agricultural landscape are largely uninterrupted by built features. Views of the PGCC west levee and NEMDC west levee are therefore intact and unified. No major roadways or highways extend along these facilities and only a few residences are present, from which these residents have views of the levees. Overall visual quality of the views is low to moderate because of the dominance of the levee slopes.

Adjacent land uses in the NEMDC South, located generally south of I-80, consist of office parks and residential neighborhoods, including Valley View Acres. The NEMDC west levee is generally maintained free of vegetation. Aesthetic values are low to moderate in this area.

3.14.2.5 WEST DRAINAGE CANAL

Land uses adjacent to the proposed West Drainage Canal relocation and the existing alignment are agricultural except for the intersection of the canal alignment and Powerline Road, where there is a residence located on the south side of the canal.

The surrounding lands are almost entirely flat. The Sacramento River east levee with trees growing along the landside of the levee is visible in the distance. Views in the area lack high aesthetic interest, but the visual components of the agricultural landscape are largely uninterrupted by built features. Few residences or other structures intrude on the views, providing for an open, intact agricultural landscape. Viewer groups consist of agricultural workers and travelers along Powerline Road, which crosses the canal. The overall visual quality of the area is considered moderate due to open views with minimal intrusive elements.

3.14.2.6 BORROW SITES

South Fisherman's Lake Borrow Area

The Fisherman's Lake Borrow Area is located near the Sacramento River east levee in the Natomas Basin, which is in cultivated agriculture. The topography of the site and surrounding area is flat, with the only topographic relief provided by the Sacramento River east levee. Scattered residences located along the levee are present in views of the area. Views of the area lack high aesthetic interest, but the visual components of the agricultural or open space landscape is largely uninterrupted by built features in the immediate vicinity of the site. Viewer groups consist of agricultural workers and travelers along San Juan Road and Bryte Bend Road. The overall visual quality of the area is considered moderate, due to the open views with minimal intrusive elements.

West Lakeside School Site Borrow Site

The West Lakeside School Site borrow site is a 41-acre site located in the Natomas Basin, adjacent to an existing residential subdivision that is within the city of Sacramento. The site is currently in agricultural use and is treeless, but is proposed by Natomas Unified School District as a new high school site. The proposed school is currently undergoing environmental review. A berm separates the site from the subdivision to the east. Views of the site lack any unique scenic features. Viewer groups consist of residents in the subdivision to the east; however, the berm blocks these views. The overall visual qualities of the site are considered moderate.

Triangle Properties Borrow Area

The Triangle Properties Borrow Area is located to the immediate east of the PGCC. The area, like the Natomas Basin, has little topographic relief and the dominant landscape feature is formed by the levee of the PGCC. The built environment consists of scattered farm complexes. A small cemetery is located on Howsley Road. The majority of the site is used for rice cultivation and is treeless. Those trees that exist on the site are associated with the farm complexes for the most part. Views of the area lack high aesthetic interest, but the visual components of the agricultural or open space landscapes are largely uninterrupted by built features. The overall visual quality of the area is considered moderate, due to the open views with minimal intrusive elements.

3.15 UTILITIES AND SERVICE SYSTEMS

This section addresses the following public utilities and service systems: water and wastewater, solid waste, electrical and natural gas, telephone and cable, and fire and police protection services. Drainage systems are described in Section 3.5, "Hydrology and Hydraulics."

3.15.1 REGULATORY SETTING

3.15.1.1 FEDERAL

There are no Federal laws, regulations, policies, or ordinances related to utilities and service systems that are relevant to the NLIP, including the Phase 4b Project.

3.15.1.2 STATE

There are no state laws, regulations, policies, or ordinances related to utilities and service systems that are relevant to the NLIP, including the Phase 4b Project.

3.15.1.3 REGIONAL AND LOCAL

There are no local laws, regulations, policies, or ordinances related to utilities and service systems that are relevant to the NLIP, including the Phase 4b Project.

3.15.2 ENVIRONMENTAL SETTING

3.15.2.1 WATER SUPPLY

Agricultural irrigation water is provided in the Natomas Basin in Sutter and Sacramento Counties by Natomas Central Mutual Water Company (NCMWC), a private purveyor of irrigation water to farmlands, and through on-site wells and private river pumps. NCMWC provides water to more than 33,000 acres of land through pipelines, pumps, and more than 50 miles of canals.

The Sacramento County Water Agency provides municipal and industrial water service within Sacramento County, although much of the Natomas Basin receives only agricultural and irrigation water service supplied by NCMWC.

3.15.2.2 WASTEWATER

The Sacramento Regional County Sanitation District provides regional sewage services in the unincorporated areas of Sacramento County. The Sacramento Area Sewer District is responsible for providing and maintaining sewer services in incorporated Sacramento County.

Septic systems within the NLIP, including the Phase 4b Project area are under the jurisdiction of the Sacramento County Environmental Management Department in Sacramento County and the Sutter County Environmental Health Services in Sutter County.

3.15.2.3 SOLID WASTE

The nearest landfills in the project region that could be used for waste disposal during project construction are listed in **Table 3.15-1**. No landfills are located in Sutter County.

3.15.2.4 ELECTRICAL AND NATURAL GAS SERVICE

The Sacramento Municipal Utility District provides electrical service to customers in the city of Sacramento and the Sacramento County portion of the Natomas Basin (Sacramento LAFCo 2007). The Pacific Gas and Electric Company provides electrical and natural gas services in Sutter County. Standard 12-kilovolt electrical distribution lines supported overhead by wooden poles are located roughly parallel to the Sacramento River east levee (Reach A:16–20), American River north levee, and the west levees of the PGCC and NEMDC North and South.

Table 3.15-1
Major Landfills in the NLIP Project Region

Facility (County)	Location	Capacity
Yolo County Landfill (Yolo County)	County Road 28h and County Road 104 Woodland, CA 95776	Maximum permitted capacity: 49,035,200 cubic yards Remaining capacity (as of Jannary 1, 2008): 37,308,000 cubic yards
Sacramento County Landfill (Sacramento County)	12701 Kiefer Boulevard Sloughhouse, CA 95683	Maximum permitted capacity: 117,400,000 cubic yards Remaining capacity (as of September 12, 2005): 112,900,000 cubic yards
Western Regional Landfill (Placer County)	3195 Athens Road Lincoln, CA 95648	Maximum permitted capacity: 36,350,000 cubic yards Remaining capacity (as of June 30, 2005): 29,093,819 cubic yards

Source: California Integrated Waste Management Board 2009; Data compiled by AECOM in 2009

3.15.2.5 TELEPHONE AND CABLE

Communications service in the NLIP, including the Phase 4b Project area is provided by multiple providers, including AT&T, Sprint, Comcast, and SureWest.

3.15.2.6 FIRE AND POLICE PROTECTION

The Sutter County Fire Department and the Sutter County Sheriff's Department provide fire and police protection, respectively, for Sutter County. The Natomas Fire Protection District of the City of Sacramento provides fire protection services for the portion of the Natomas Basin south of Sutter County by contract between the City and County of Sacramento (Sacramento LAFCo 2007). The unincorporated areas of Sacramento County are under the jurisdiction of the Sacramento County Sheriff's Department, and the City of Sacramento Police Department provides police protection services within the Sacramento city limits.

3.15.2.7 UTILITY ENCROACHMENTS

The Phase 4b Project would encroach upon multiple types of utility equipment, including wells, electric conduits, telephone conduits, conductors, irrigation pipes, gas lines, sewer lines, electrical power lines, and street lights, along the Sacramento River east levee, the American River north levee, and the west levees of the PGCC and NEMDC North and South. As described in Section 2.3.3.2, "Adjacent Levee Alternative (Proposed Action)," to the extent feasible, mainline utility infrastructure, such as power poles, would be relocated beyond the landside levee toe or berms. Similarly, irrigation facility conveyance, distribution boxes, wells, and standpipes within the project footprint would be demolished and replaced as needed; underground structures, such as wells and septic tanks, would be abandoned according to state and local regulations.

3.16 HAZARDS AND HAZARDOUS MATERIALS

3.16.1 REGULATORY SETTING

3.16.1.1 FEDERAL

The following Federal laws related to hazards and hazardous materials are relevant to the NLIP, including the Phase 4b Project, and are described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

- Resource Conservation and Recovery Act;
- Worker Safety Requirements;
- Part 77 of the Federal Aviation Regulations (under "Obstructions and Airport Land Use Compatibility"); and
- Federal Aviation Administration's Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* (under "Wildlife Hazards on or Near Airports").

3.16.1.2 STATE

Hazardous Materials Handling

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires preparation of hazardous materials business plans and disclosure of hazardous-materials inventories. A business plan includes an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures (California Health and Safety Code, Division 20, Chapter 6.95, Article 1). Statewide, the California Department of Toxic Substances Control (DTSC) has primary regulatory responsibility for management of hazardous materials, with delegation of authority to local jurisdictions that enter into agreements with the state. Local agencies, including the Sutter County Environmental Health Division, administer these laws and regulations.

Worker Safety Requirements

The California Occupational Health and Safety Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within California. Cal/OSHA regulations pertaining to the use of hazardous materials in the workplace (Title 8 of the CCR) include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and preparation of emergency action and fire prevention plans. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous-waste sites. The hazard communication program requires that employers make Material Safety Data Sheets available to employees and document employee information and training programs. Construction activities near high priority subsurface installation, such as the natural gas pipelines that penetrate the levee, are regulated by CCR Title 8, Section 1541.

Emergency Response to Hazardous Materials Incidents

California has developed an emergency response plan to coordinate emergency services provided by Federal, state, and local governments and private agencies. Response to hazardous-material incidents is one part of this plan. The plan is managed by the Governor's Office of Emergency Services (OES), which coordinates the responses of other agencies, including the California Environmental Protection Agency (Cal/EPA), California Highway Patrol (CHP), California Department of Fish and Game, Central Valley RWQCB, and Sutter County Fire Services Department.

Hazardous Materials Transport

The U.S. Department of Transportation (USDOT) regulates transportation of hazardous materials between states. State agencies with primary responsibility for enforcing Federal and state regulations and responding to hazardous materials transportation emergencies are CHP and Caltrans. Together, these agencies determine container types used and license hazardous-waste haulers for transportation of hazardous waste on public roads.

The USDOT Federal Railroad Administration (FRA) enforces the Hazardous Materials Regulations, which are promulgated by the Pipeline and Hazardous Materials Safety Administration for rail transportation. These

regulations apply to railroads, shippers, and other transporters of hazardous materials. Such transporters are required to adhere to security plans and to train employees involved in offering, accepting, or transporting hazmat on both safety and security matters.

California Government Code Section 65962.5 (Cortese List)

The provisions of California Government Code Section 65962.5 are commonly referred to as the "Cortese List" (after the Legislator who authored the legislation that enacted it). The Cortese List is a planning document used by state and local agencies to comply with CEQA requirements in providing information about the location of hazardous materials release sites. California Government Code Section 65962.5 requires Cal/EPA to at a minimum develop an updated Cortese List annually. DTSC is responsible for a portion of the information contained in the Cortese List. Other California state and local government agencies are required to provide additional hazardous material release information for the Cortese List.

3.16.1.3 REGIONAL AND LOCAL

Sutter County General Plan

The Health and Safety Element of the *Sutter County General Plan* includes Goal 7.f, which is included "to minimize the risk of personal injury, property damage, and environmental degradation resulting from the use, transport, disposal, and release/discharge of hazardous materials." Relevant policies related to this goal include:

- **Policy 7.F-1:** The County shall ensure that the use and disposal of hazardous materials complies with appropriate federal, state and local requirements.
- **Policy 7.F-3:** Review of all proposed development projects that manufacture, use or transport hazardous materials shall be coordinated between the County and appropriate state and federal agencies.

Sacramento County General Plan

The *Sacramento County General Plan* is currently being updated (the DEIR was issued in spring 2009), but is not yet adopted. The Public Health and Safety Objective of the existing *Sacramento County General Plan* (Sacramento County 1993) is to "protect the residents of Sacramento County from the effects of a hazardous material incident via the implementation of various public health and safety programs." The following policies may be applicable to the project.

- **Policy HM-4:** The handling, storage, and transport of hazardous materials shall be conducted in a manner so as not to compromise public health and safety standards.
- **Policy HM-7:** Encourage the implementation of workplace safety programs and to the best extent possible ensure that residents who live adjacent to industrial or commercials facilities are protected from accidents and the mishandling of hazardous materials.
- **Policy HM-8:** Continue the effort to prevent ground water and soil contamination.
- **Policy HM–9:** Continue the effort to prevent surface water contamination.
- **Policy HM-10:** Reduce the occurrences of hazardous material accidents and the subsequent need for incident response by developing and implementing effective prevention strategies.
- **Policy HM-11:** Protect residents and sensitive facilities from incidents which may occur during the transport of hazardous materials in the County.

City of Sacramento General Plan

There are no policies from the *City of Sacramento General Plan* that are relevant to the NLIP, including the Phase 4b Project.

3.16.2 Environmental Setting

For purposes of this section, the term "hazardous materials" refers to both hazardous substances and hazardous wastes. A "hazardous material" is defined as "a substance or material that…is capable of posing an unreasonable risk to health, safety, and property when transported in commerce" (49 CFR Section 171.8). California Health and Safety Code Section 25501 defines a hazardous material as follows:

> "Hazardous material" means any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

"Hazardous wastes" are defined in California Health and Safety Code Section 25141(b) as wastes that:

> because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause, or significantly contribute to an increase in mortality or an increase in serious illness[, or] pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

3.16.2.1 Database Search

A search of the DTSC's Envirostor database and SWRCB's Geotracker database revealed the following sites within the NLIP footprint:

- Yuki Farm leaking underground storage tank (UST),
- UC River Ranch leaking UST, and
- Olympian Oil leaking UST. (SWRCB 2009)

Within the Phase 4b Project footprint, the databases revealed one site: the Olympian Oil site located at 4422 Northgate Boulevard, which overlaps with the Pumping Plant No. 8 footprint. According to documentation uploaded to the SWRCB's Geotracker Web site, four 10,000-gallon steel underground storage tanks (USTs) containing gasoline were removed from the Olympian Oil site in May 1998. Subsequent soil and groundwater sampling established that the USTs had leaked petroleum hydrocarbons and fuel oxygenates (i.e., methyl tertiary butyl ether [MTBE]) into the environment. Eight monitoring wells were installed between 2004 and 2005. Remediation began in 2005, under the oversight of Sacramento County and the Central Valley RWQCB (SWRCB 2009).

Initial monitoring in 2005 indicated that groundwater had been contaminated with gasoline range organics, methanol, MTBE, tert-butyl alcohol, and toluene. The most recent quarterly sampling results available from June 21, 2009 indicate that two of the monitoring wells contain MTBE above the reporting limit (McCampbell Analytical 2009). Quarterly monitoring of groundwater was still required at the time of release of this DEIS/DEIR under the oversight of Sacramento County and the Central Valley RWQCB.

3.16.2.2 ENVIRONMENTAL SITE ASSESSMENTS

Kleinfelder conducted Phase I Environmental Site Assessments (ESAs) on several parcels within the NLIP area (Kleinfelder 2008, 2009a), including on several parcels within the Phase 4b Project footprint. Phase I ESAs are intended to determine the presence of recognized environmental conditions (RECs), which are defined as a past, present, or likely future release of hazardous substances or petroleum products into the soil, groundwater, or surface water of a site. Completion of additional Phase I ESAs is ongoing; however, the following is a summary of the findings excerpted from the Phase I ESAs completed for the NLIP as of the time of release of this DEIS/DEIR, including the findings that may affect the Phase 4b Project area.

Phase 1 Project

The following issues and uses were discovered during site surveys and database searches that may have affected the following parcels within the Phase 1 Project footprint:

- **Assessor Parcel Number (APN) 35-010-005:** possible transite (asbestos) pipe and pesticide residues associated with historical agricultural use.
- **APNs 35-010-009 and 35-020-006:** possible transite pipe and pesticide residues associated with historical agricultural use.

Phase 2 Project

The following issues and uses were discovered during site surveys and database searches that may have affected the following parcels within the Phase 2 Project footprint:

- **APNs 35-020-010 and -011:** above ground storage tank (AST); septic systems; water wells; pole-mounted transformer that may contain polychlorinated biphenyls (PCBs); possible transite pipe and pesticide residues associated with historical agricultural use; and residential structures that may contain asbestos building materials or lead paint.
- **APNs 35-020-018, -019, -020, and 35-030-002:** UST; AST; and airplane use and storage.
- **APN 35-050-027:** water well; septic system; pole-mounted transformer that may contain PCBs; and ASTs.
- **APN 35-050-028:** stained soil; water well; septic system; and ASTs.
- **APN 35-050-029:** debris; possible transite pipe and pesticide residues associated with historical agricultural use; water sell; septic tank; and animal husbandry.
- **APN 35-050-030:** ASTs; burn piles; and animal husbandry.
- **APN 35-330-006:** inactive water well; stored chlorine; and possible transite pipe and pesticide residues associated with historical agricultural use.
- **APN 35-330-013:** unimproved roadway and drainage ditch; ASTs; and possible transite pipe and pesticide residues associated with historical agricultural use.
- **APN 35-330-014:** possible transite pipe and pesticide residues associated with historical agricultural use; buildings; and possible water wells and septic tanks.
- **APN 35-330-015:** possible transite pipe and pesticide residues associated with historical agricultural use.

- **APNs 201-0010-008 and -011:** possible transite pipe and pesticide residues associated with historical agricultural use; and pole-mounted transformer that may contain PCBs.
- **APN 201-0010-044:** possible transite pipe and pesticide residues associated with historical agricultural use; pole-mounted transformer that may contain PCBs; and possible oil and gas well.
- **APNs 201-0010-046 and 201-0140-062:** possible transite pipe and pesticide residues associated with historical agricultural use; and possible oil and gas wells.
- **APNs 201-0140-064 and -065:** possible transite pipe and pesticide residues associated with historical agricultural use; and possible subsurface features (wells, septic systems).
- **APNs 35-010-001, -008, and 35-030-003:** pole-mounted transformer that may contain PCBs; possible transite pipe and pesticide residues associated with historical agricultural use; and possible water well.
- **APN 35-330-004:** possible oil and gas wells; and possible transite pipe and pesticide residues associated with historical agricultural use.
- **APN 35-330-017:** possible transite pipe and pesticide residues associated with historical agricultural use.
- **APN 35-330-024:** possible transite pipe and pesticide residues associated with historical agricultural use; possible oil and gas wells; and water well.

Phase 3 Project

The following issues and uses were discovered during site surveys and database searches that may have affected the following parcels within the Phase 3 Project footprint:

- **APN 201-0150-033:** water well; monitoring wells for known gasoline spill; and residential subsurface structures, that are used to monitor a known gasoline spill.
- **APNs 201-0150-040, -041, and -042:** plugged and abandoned dry hole; and an underground conveyance pipeline.
- **APNs 201-0150-055 and -059:** unimproved landing strip that may have been used for crop dusting activities; residential subsurface structures; idle gas well; and water wells.
- **APN 201-0270-028:** heavy equipment leaking engine oil and hydraulic fluid and numerous locations with discolored soil, possible USTs are located on site; ASTs; automobile batteries; and electrical equipment
- **APN 201-0270-037:** possible UST.
- **APN 201-0270-048:** damaged automotive battery.
- **APN 201-0280-044:** possible lead contamination from leaded gasoline due to proximity to roadways; and pesticide and herbicide residue, underground irrigation pipelines that contain asbestos may exist on site due to past agricultural use.
- **APN 35-080-021:** water pumps with two associated aboveground storage tanks containing diesel fuel.
- **APNs 201-0010-023, -024, and -025:** possible transite pipe and pesticide residues associated with historical agricultural use; buildings; unknown white granular substance, and possible water well and septic system.

- **APNs 201-0150-020 and -041:** possible transite pipe and pesticide residues associated with historical agricultural use; possible gas well; pole-mounted transformer that may contain PCBs; water well; and residential subsurface features (e.g., septic tanks, heating oil, tanks).
- **APNs 201-0150-050 and 201-0160-048:** possible transite pipe and pesticide residues associated with historical agricultural use; farm buildings; idle gas well; and ASTs.
- **APN 201-0240-037:** possible transite pipe and pesticide residues associated with historical agricultural use.
- **APNs 201-0250-002, -006, -008, -010, -016, -017, -018, and -019:** two ASTs, residential subsurface features, potential pesticides associated with golf course; and possible transite pipe and pesticide residues associated with historieal agricultural use.
- **APNs 201-0250-011, -12, and -013:** possible transite pipe and pesticide residues associated with historical agricultural use; residential subsurface structures; and pole-mounted transformer that may contain PCBs.
- **APN 201-0270-047:** possible transite pipe and pesticide residues associated with historical agricultural use.
- **APN 201-0280-006:** possible release formic acid; ASTs; soil staining; debris piles; natural gas pipelines; possible transite pipe and pesticide residues associated with historical agricultural use; and asbestos building materials and lead paint associated with structures.
- **APN 201-0280-013:** septic system; soil staining; AST; natural gas pipeline (petroleum); abandoned dry hole; possible transite pipe and pesticide residues associated with historical agricultural use; water wells; and asbestos building materials and lead paint associated with structures
- **APN 201-0280-037:** possible 100-gallon UST (diesel fuel); residential subsurface features, and possible transite pipe and pesticide residues associated with historical agricultural use.
- **APN 201-0280-045:** possible transite pipe and pesticide residues associated with historical agricultural use; and non-active natural gas pipeline.
- **APN 201-0330-036:** ASTs; possible septic system; and possible transite pipe and pesticide residues associated with historical agricultural use.
- **APNs 201-250-011, -012, and -013:** possible transite pipe and pesticide residues associated with historical agricultural use.
- **APNs 201-0250-042 and -044:** possible oil and gas wells.
- **APN 201-0320-020:** residential subsurface structures.
- **APN 201-0320-025:** asbestos building materials and lead paint associated with structures; water wells; septic systems; farm waste; ASTs; and possible transite pipe and pesticide residues associated with historical agricultural use.
- **APNs 35-030-008, -012, and -013:** possible transite pipe and pesticide residues associated with historical agricultural use.

Phase 4a Project

The following issues and uses were discovered during site surveys and database searches that may have affected the following parcels within the Phase 4a Project footprint:

- **APN 201-0330-019:** ASTs; abandoned dry hole; septic systems; water wells; asbestos building materials and lead paint associated with structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APN 201-0330-019:** water wells; septic systems; pole-mounted transformers that may contain PCBs, a maintenance shop, and abandoned dry hole.

- **APNs 225-0010-038, 041, and -043:** stained soil near a vehicle and two of 9 ASTs; a burn pile and two burn pits, a large stock pile of horse manure, pole-mounted transformers that may contain PCBs; abandoned and existing wells; and a pipe dripping an unknown substance found protruding from a barn.

- **APNs 225-0090-014 and 225-0110-050:** asbestos building materials and lead paint associated with structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APN 225-0090-040:** ASTs containing fuel, oil, grease, solvents and other hazardous materials; car batteries; burned debris piles; and water wells. A Phase II ESA, conducted to evaluate the presence of pesticide residues, indicates that the northern half of the parcel contains residues of toxaphene and arsenic in concentrations that are less than the pertinent screening levels for human health. Toxaphene concentrations in some discrete soil samples exceed ecological risk screening levels, but the average concentration does not.

- **APN 225-0090-069:** asbestos building materials and lead paint associated with structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APNs 225-0101-003, -004, -005, and -006:** asbestos building materials and lead paint associated with structures; possible residential subsurface structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APN 225-0101-007:** asbestos building materials and lead paint associated with structures; possible transite pipe and pesticide residues associated with historical agricultural use; jet fuel pipeline; and possibly a dry, plugged, and abandoned oil or gas well.

- **APNs 225-0101-057 and -058:** asbestos building materials and lead paint associated with structures; possible residential subsurface structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APN 225-0101-061:** a domestic water well; three septic systems with leach fields; a wood debris pile; an empty AST; a pole-mounted transformer without PCB-content labeling; and household quantities of hazardous chemicals including paint and cleaning agents were located in a locked shed.

- **APNs 225-0110-018 and -051:** asbestos building materials and lead paint associated with structures; possible residential subsurface structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APNs 225-0110-019, -020, and -036:** likely hydrocarbon contamination from automotive maintenance and a former 550-gallon UST; and miscellaneous refuse, such as used automobile batteries and automobile parts. A Phase II ESA, conducted to evaluate the presence of pesticide residues, reported that dieldrin was found to exceed ecological risk screening levels, but not human health risk screening levels.

- **APN 225-0210-026:** asbestos building materials and lead paint associated with structures; possible residential subsurface structures; and possible transite pipe and pesticide residues associated with historical agricultural use.

- **APNs 35-0250-015, 201-0270-002, and -037:** ASTs, two car batteries; unlabeled drums with unidentified contents; and various debris. Phase II ESAs, conducted to evaluate the presence of pesticide residues and the potential presence of asbestos containing or lead-based building materials, reported toxaphene and dieldrin concentrations in some discrete soil samples exceed ecological risk screening levels, the average concentrations do not. Toxaphene and dieldrin concentrations in soil samples do not exceed human health risk screening levels.

Phase 4b Project

The following issues and uses were discovered during site surveys and database searches that may have affected the following parcels within the Phase 4b Project footprint:

- **APN 35-080-022**, located northwest of the Fifield Road and Natomas Road intersection along the PGCC west levee, contains three residences and is primarily used for agriculture and light grazing. Debris, old vehicles, oil-stained tiles and soil, and numerous old containers were documented during site reconnaissance. In addition, three pole-mounted transformers that were not labeled with respect to PCBs were located on the site.

- **APN 35-120-007**, located southwest of the Fifield Road and Natomas Road intersection along the PGCC west levee, is primarily used for rice production, but also includes a residential mobile home and agriculture-related storage structures. Two burn areas, a likely fuel release, numerous ASTs, various unlabeled drums, and two pole-mounted transformers that were not labeled with respect to PCBs were found on the site. According to an interview with the former landowner, fuel was spilled on the site and the contaminated soil was removed. Kleinfelder reported that no record existed with applicable agencies of the spill or cleanup. In addition, wells and septic systems are known to exist on the site, and the parcel is associated with pesticide application and possible asbestos-containing pipelines resulting from historical agricultural use.

- **APN 35-150-005**, located north of Sankey Road along the PGCC west levee, contains a pole-mounted transformer that was not labeled with respect to PCBs, several automotive batteries, an empty pesticide container, and a capped pipeline that may be a former well. In addition, because the site was historically used for agricultural purposes, pesticides and herbicides may persist in the soil, and asbestos-containing pipelines may exist on the site.

- **APN 35-170-080** is located along the NEMDC west levee approximately half way between Sankey Road and Riego Road. Site observations were related to the property's history of agricultural and residential uses, which include pole-mounted transformers that may contain PCBs, a septic system, and possible underground irrigation pipelines that could contain asbestos.

- **APN 35-271-021**, located along the NEMDC west levee approximately half way between Sankey Road and Riego Road, contains numerous automobile batteries stored directly on the soil, approximately 44 abandoned vehicles that may have leaked hazardous substances or petroleum products onto the site, numerous empty steel and plastic drums and buckets of hydraulic oil, a large pile of horse manure, and areas of stained soil. In addition, because the site was historically used for agricultural purposes, pesticides and herbicides may persist in the soil and asbestos-containing pipelines may exist on the site.

- **APN 35-271-015** is located approximately 2,500 feet north of Riego Road along the NEMDC west levee. During site reconnaissance, Kleinfelder observed pole-mounted transformers that were not labeled with respect to PCBs, a septic system, areas of stained soil, and numerous bottles containing fuel. In addition, because the site was historically used for agricultural purposes, pesticides and herbicides may persist in the soil, and asbestos-containing pipelines may exist on the site.

- **APN 225-0010-0013** is located near the western extent of the West Drainage Canal. Kleinfelder observed pole-mounted transformers that were not labeled with respect to PCBs and three irrigation wells. According to the State of California Division of Oil, Gas, and Geothermal Resources, a plugged and abandoned dry hole is

located on the northeastern portion of the site. In addition, because the site was historically used for agricultural purposes, pesticides and herbicides may persist in the soil, and asbestos-containing pipelines may exist on the site.

3.16.2.3 Land Use Associated Hazards

The Natomas Basin has historically and is currently largely used for agricultural purposes. This type of land use can often involve the application of pesticides, residues of which may remain in soils for years. Soil testing results from the Phase 4b Project footprint had not been completed at the time of release of this DEIS/DEIR; however, soil testing performed by Kleinfelder in 2009 for the Phase 4a Project indicates the presence of pesticide residues, including arsenic, dieldrin, and toxaphene, within the Phase 4a Project footprint (Kleinfelder 2009b). Elevated concentrations of arsenic in soil can be a result of historic arsenic-containing pesticide application; however, arsenic can also occur naturally in certain soils, including those found in the Phase 4a Project footprint and throughout California. The concentrations of this naturally occurring arsenic in the Phase 4a Project footprint soils exceed some screening levels (e.g., EPA Region 5 Ecological Screening Levels) (Kleinfelder 2009b). The concentrations of pesticide residues found on these sites do not constitute a reportable condition because the pesticides appear to have been properly applied for agricultural purpose; were not detected at levels exceeding the California hazardous waste threshold limits; and are not considered to be an imminent threat to public health, welfare, or the environment based on risk evaluations (Kleinfelder 2009b). If pesticide concentrations in the soil are found that exceed pertinent threshold levels, a plan for safe transport, use, and disposal of these soils would be prepared. Soil reuse could include efforts to reduce concentrations of residual pesticides by implementing actions such as containing portions of the affected topsoil within the core of seepage berms and rip, mix, and/or amend affected topsoil that is re-spread onto borrow sites, levees, and/or berm surfaces. Because of these findings, it is reasonable to assume that pesticide residues could exist within the Phase 4b Project footprint as well. It would be speculative to predict the specific types or concentrations of pesticides existing on sites in the Phase 4b Project footprint in advance of testing.

3.16.2.4 Natomas Basin Evacuation Routes

The Sacramento County Municipal Services Agency, Department of Water Resources provides evacuation routes within the greater Sacramento Area, including the Natomas Basin, in the case of a hypothetical levee break (Sacramento County 2005). While these routes are specific to a flood event, the roadways would likely be the same as those in any emergency event requiring evacuation (e.g., major hazardous materials spill), as follows: Airport Boulevard, Arena Boulevard, Del Paso Road, El Centro Road, Elkhorn Boulevard, Elverta Road, Garden Highway, Natomas Boulevard, Northgate Boulevard, Power Line Road, San Juan Road, Truxel Road, West El Camino Avenue, SR 99, I-5, and I-80.

3.16.2.5 Schools within One-Quarter Mile of the Project Footprint

The State CEQA Guidelines require EIRs to assess whether a project will emit hazardous air emissions or involve the handling of extremely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school (see California PRC Sections 21151.2 and 21151.4; Appendix G of the State CEQA Guidelines). Schools within one-quarter mile of the Natomas Basin, including the Phase 4b Project footprint, are:

- Bryte Elementary School, 637 Todhunter Street, West Sacramento, CA;
- Garden Valley Elementary School, 3601 Larchwood Drive, Sacramento, CA;
- Harmon Johnson Elementary School, 2591 Edgewater Road, Sacramento, CA;
- Leroy F. Green Middle School, 2950 West River Drive, Sacramento, CA;
- Merryhill School, 2565 Millcreek Drive, Sacramento, CA;
- Riverbank Elementary School, 1100 Carrie Street, Broderick, CA; and
- Two Rivers Elementary School, 3201 West River Drive, Sacramento, CA.

3.16.2.6 AIRPORT SAFETY

Safety hazards associated with airports are generally related to construction of tall structures and the creation of wildlife attractants (e.g., wetlands, golf courses, and waste disposal operations) that could interfere with airplane flight paths. The State CEQA Guidelines (California PRC Section 21096) require analysis of airports within 2 nautical miles of a proposed project. Nine airports or airstrips are located within 2 nautical miles of the NLIP area, including the Phase 4b Project footprint, as shown on **Plate 3-8**.

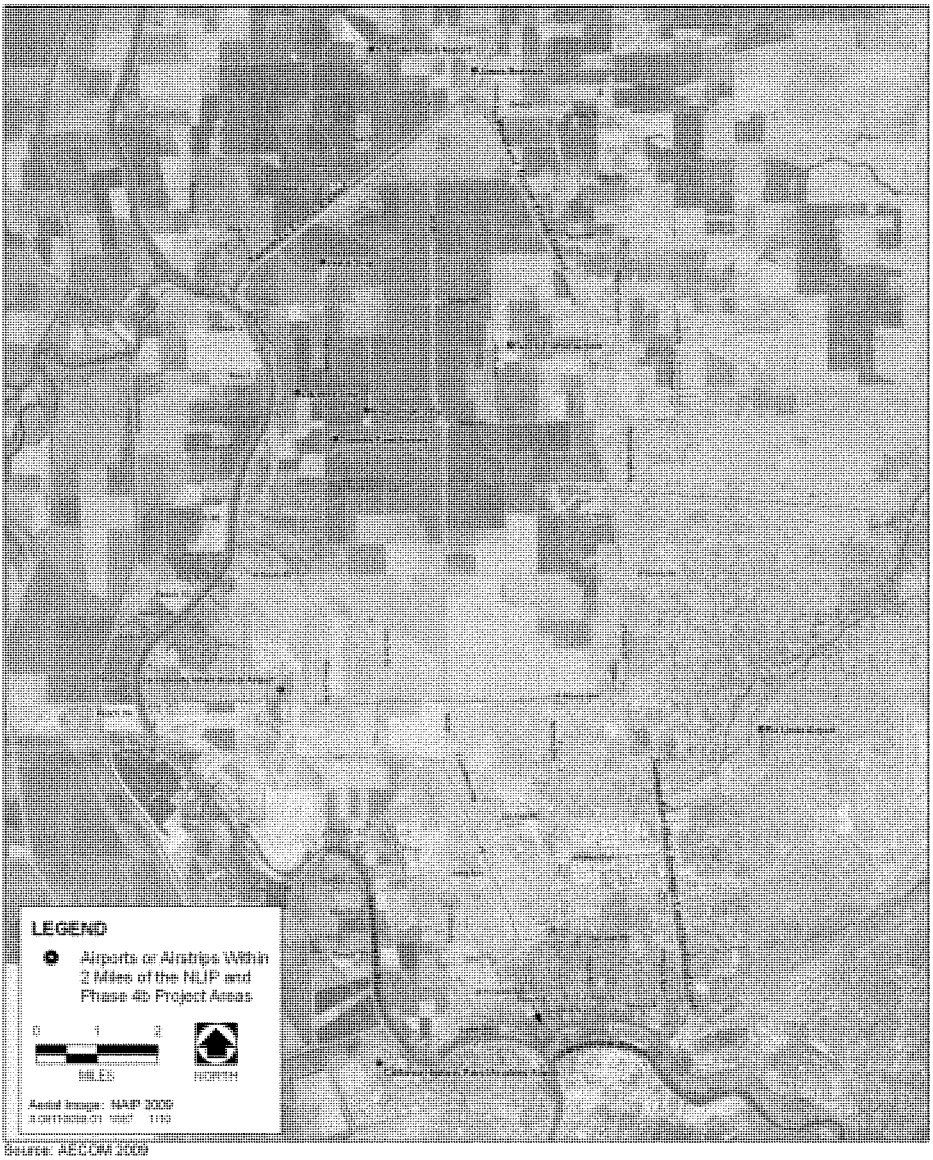
The Sacramento International Airport is located approximately 1.5 miles east of the Sacramento River east levee and 12 miles north of downtown Sacramento. The West Drainage Canal and proposed Natomas Levee Class 1 Bike Trail are the closest project features to the Airport. The Airport includes the Airport Operations Area and adjacent terminals, parking lots, and landscaped areas. Two 8,600-foot parallel runways are oriented roughly north-south. Three airline terminals and additional buildings are also associated with various airport operations. Approximately half of the 5,900 acres of Sacramento County-owned land at the Airport is located due south and the other half is due north of the Airport Operations Area. Sacramento County-owned property outside of the Airport Operations Area functions as aviation "bufferlands" for the purposes of operational land use compatibility (i.e., to prevent encroachment by land uses, such as residential development, that are incompatible with aircraft operations). Agricultural leases on these bufferlands expired December 31, 2007, and they are currently managed as grassland open space.

The Airport has one of the highest numbers of reported wildlife strikes of all California airports (SCAS 2007). According to the FAA Bird Strike Database, 1,618 wildlife strikes were recorded at the Airport between January 1, 1990 and December 31, 2009, 28 of which reported substantial damage (FAA 2009). Birds with flocking tendencies and birds of relatively large size, such as waterfowl, gulls, herons, egrets, pigeons, blackbirds, and raptors, present the greatest threat to aviation at the Airport (SCAS 2007).

The frequency of wildlife strikes at the Airport is directly related to the Airport's location. The Airport is situated in the western portion of the Natomas Basin, which is a relatively flat, low-lying area that was part of the Sacramento/American River floodplain. Historically, wetlands in the Basin attracted tremendous numbers of migratory waterfowl because it is located within the Pacific Flyway. Land reclamation and the extensive construction of canals, levees, and pumping stations have allowed more than 80% of the Natomas Basin to be converted to agricultural production (City of Sacramento, Sutter County, and TNBC 2003). Agricultural crops and open water are the primary wildlife attractants within the Airport Perimeter B. Rice, wheat, safflower, corn, and alfalfa are all grown in the non-Airport portion of the Airport Perimeter B. The FAA considers rice cultivation, including flooding of the rice fields in winter and summer, as the most incompatible current land use in the Airport Perimeter B (SCAS 2007).

Since 1996, the FAA has required SCAS to maintain and implement a *Wildlife Hazards Management Plan* (WHMP) because of the significant number of wildlife strikes that occur at the Airport. The plan emphasizes the identification and abatement of wildlife hazards and outlines steps for monitoring, documenting, and reporting potential wildlife hazards and birds strikes. Implementation of the WHMP involves an integrated approach that relies on a combination of wildlife control and land management strategies (SCAS 2007). The following land management objectives in the WHMP are relevant to the NLIP, including the Phase 4b Project:

- maintain grasslands in the Airport Operations Area to discourage use by hazardous wildlife,
- reduce aquatic habitat for hazardous wildlife,
- reduce hazardous wildlife use of ditches in the Airport Operations Area, and
- reduce hazardous wildlife on Sacramento County–owned agricultural land in the 10,000-foot Airport Perimeter B.



Source: AECOM 2009

Proximity of Airports to the Natomas Basin **Plate 3-8**

The FAA has identified two potentially hazardous wildlife attractants on Airport land within the Airport Perimeter B: the Airport West Ditch and the rice fields north of the Airport Operations Area. The Airport West Ditch is an open ditch that conveys irrigation and drainage water through the western portion of the Airport Operations Area. Because of its proximity to the runway, the Airport West Ditch is not only a potentially hazardous wildlife attractant, it is also a potential hazard for aircraft that may leave the runway under difficult conditions. The former rice fields occupy approximately 500 acres north of the Airport Operations Area. These fields were leveled and diked to hold water for rice production. Accordingly, they became a potentially hazardous wildlife attractant as a result of irrigation during the growing season and rainfall during the non-growing season. To reduce the extent of this hazard, SCAS has chosen not to renew the leases on these rice lands that expired December 31, 2007, as noted above.

Of the remaining airports within the Phase 4b Project footprint, the Rio Linda Airport is a public-use airport; the CHP Academy Airport is used by the CHP for training purposes; and Sopwith Farm, Lauppes Strip, Tenco Tractor, Vestal Strip, James Brothers, and Scheidel Ranch are private airstrips associated with agriculture. These airports are depicted on **Plate 3-8**.

3.16.2.7 WILDFIRE HAZARDS

Wildfires pose a hazard to both persons and property in many areas of California. Wildland fires are a particularly dangerous threat to development located in forest and shrub areas. The severity of wildland fires is primarily influenced by vegetation, topography, and weather (temperature, humidity, and wind). The California Department of Forestry and Fire Protection (CDF) has developed a fire hazard severity scale that considers vegetation, climate, and slope to evaluate the level of wildfire hazard in all State Responsibility Area lands. A State Responsibility Area is defined as part of the state where CDF is primarily responsible for providing basic wildland fire protection assistance. Areas under the jurisdiction of other fire protection services are considered to be Local Responsibility Areas.

CDF designates three levels of Fire Hazard Severity Zones (Moderate, High, and Very High) to indicate the severity of fire hazard in a particular geographical area. According to CDF's Fire Resource Assessment Program, the majority of the land in Sacramento and Sutter Counties is located in either a "nonflammable" or "moderate" zone for wildland fires (CDF 2007a). No Very High Fire Hazard Severity Zones are located in the NLIP area, including the Phase 4b Project area, within either Sacramento County or Sutter County (CDF 2007b). In addition, neither Sutter nor Sacramento Counties is located in a State Responsibility Area (CDF 2007c, 2007d).

3.17 ENVIRONMENTAL JUSTICE

Environmental justice is defined by the EPA's Office of Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that "no group of people, including racial, ethnic, or socioeconomic group, shall bear a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies."

3.17.1 REGULATORY SETTING

3.17.1.1 FEDERAL

The following Federal law related to environmental justice is relevant to the NLIP, including the Phase 4b Project, and is described in detail in Chapter 6, "Compliance with Federal Environmental Laws and Regulations":

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

3.17.1.2 STATE

Most state governments have plans and policies intended to protect and expand the local and regional economies affecting the communities and residents within their jurisdictions. State plans and policies also frequently address other social and economic impact topics, including fiscal conditions and related public services that affect local residents' quality of life.

Within California, Senate Bill (SB) 115 (Chapter 690, Statutes of 1999) was signed into law in 1999. The legislation established OPR as the coordinating agency for state environmental justice programs (California Government Code Section 65040.12[a]) and defined environmental justice in statute as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (California Government Code Section 65040.12[e]). SB 115 further required Cal/EPA to develop a model environmental justice mission statement for boards, departments, and offices within the agency by January 1, 2001 (California PRC Sections 72000–72001).

In 2000, SB 89 (Chapter 728, Statutes of 2000) was signed, which complemented SB 115 by requiring the creation of an environmental justice working group and an advisory group to assist Cal/EPA in developing an intra-agency environmental justice strategy (California PRC Sections 72002–72003). SB 828 (Chapter 765, Statutes of 2001) added and modified due dates for the development of Cal/EPA's intra-agency environmental justice strategy and required each board, department, and office within Cal/EPA to identify and address, no later than January 1, 2004, any gaps in its existing programs, policies, and activities that may impede environmental justice (California PRC Sections 71114–71115).

Cal/EPA adopted its environmental justice policy in 2004 (California PRC Sections 71110–71113). This policy (or strategy) provides guidance to its resource boards, departments, and offices. It is intended to help achieve the state's goal of "achieving fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation and enforcement of environmental laws and policies."

Assembly Bill (AB) 1553 (Chapter 762, Statutes of 2001) required OPR to incorporate environmental justice considerations in the *General Plan Guidelines*. AB 1553 specified that the guidelines should propose methods for local governments to address the following:

- planning for the equitable distribution of new public facilities and services that increase and enhance community quality of life,
- providing for the location of industrial facilities and uses that pose a significant hazard to human health and safety in a manner that seeks to avoid over-concentrating these uses in proximity to schools or residential dwellings,
- providing for the location of new schools and residential dwellings in a manner that avoids proximity to industrial facilities and uses that pose a significant hazard to human health and safety, and
- promoting more livable communities by expanding opportunities for transit-oriented development.

Although environmental justice is not a mandatory topic in the general plan, OPR is required to provide guidance to cities and counties for integrating environmental justice into their general plans. The 2003 edition of the *General Plan Guidelines* included the contents required by AB 1553 (see pages 8, 12, 20–27, 40, 114, 142, 144, and 260 of the revised *General Plan Guidelines*).

3.17.1.3 REGIONAL AND LOCAL

There are no local laws, regulations, policies, or ordinances related to environmental justice that are relevant to the NLIP, including the Phase 4b Project.

3.17.2 ENVIRONMENTAL SETTING

Table 3.17-1 below summarizes relevant demographic data for the Natomas Basin, including the Phase 4b Project, area (see **Appendix H** for the full set of 2000 Census data relevant to this EIS/EIR). This table compares the proportion of the total population that was reported in the 2000 census as low-income or as minorities for census block groups in the Natomas Basin with the same statistics for Sacramento and Sutter Counties. This comparison demonstrates that the proportion of the Natomas Basin's low-income population does not exceed 50%, nor is it significantly higher than the total proportion of the low-income population in Sacramento and Sutter Counties. The block groups in the Sacramento County portion of the Natomas Basin, however, do have a significant minority population (60.36% of the total population).

Table 3.17-1
Minority and Poverty Status for Relevant Geographic Units (Sutter and Sacramento Counties)[1]

	Block Groups in Sutter County	Block Groups in Sacramento County	Sutter County	Sacramento County
Percentage of the Population with Minority Status	23.34%	60.36%	39.78%	42.24%
Percentage of the Population with Poverty Status Under the U.S. Census 1999 Threshold	19.11%	15.16%	15.54%	14.13%

[1] Expressed as a percentage of the total population.

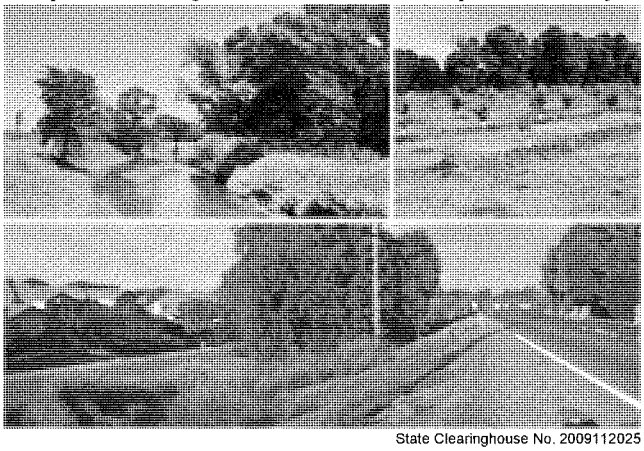
Source: Data from U.S. Census Bureau 2000 and compiled by AECOM in 2009

According to the data presented in Section 3.3, "Land Use, Socioeconomics, and Population and Housing," minority and/or low income populations are not disproportionately prevalent within the Phase 4b Project area. The minority population with the largest representation in the census tract block groups in which the Phase 4b Project is located is Hispanic. This group makes up approximately 16% of the block group population nearest the NCC as compared to 22% of the Sutter County population as a whole, and in the Sacramento County block groups 10% of the population, as compared to 16% of the population in Sacramento County. The median family income levels as reported in the 2000 U.S. Census for the Sacramento County census tracts where the Phase 4b Project is located were $66,146 in the area north of Del Paso Road and West of Powerline Road and $59,750 in the area east of Powerline Road and south of Del Paso Road. These median income levels are above the median income level of $50,717 reported for Sacramento County. For the census tract south of the NCC in Sutter County, the median family income was $50,000 and for Sutter County the Census 2000 reported a median family income of $44,300. (U.S. Census Bureau 2000).

No Native American tribes currently reside within the Phase 4b Project area as a distinct population group and so would not invoke Environmental Justice.

Final Environmental Impact Statement/Final Environmental Impact Report on the

American River Watershed Common Features Project/ Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project



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Volume 2 – Chapters 4 through Appendix I

Prepared for:

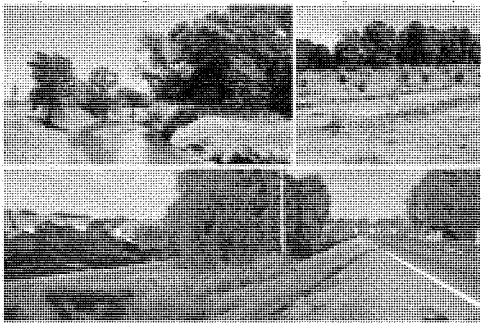
US Army Corps of Engineers ®
Sacramento District

SAFCA
Sacramento Area Flood Control Agency

October 22, 2010

Final Environmental Impact Statement/Final Environmental Impact Report on the

American River Watershed Common Features Project/ Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project



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4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

This chapter (1) describes the approach to the Phase 4b Project environmental analysis (Section 4.1); (2) analyzes the significant environmental impacts of the Phase 4b Project and presents mitigation measures, organized by issue area (Sections 4.2–4.17); and (3) summarizes significant environmental impacts from previous NLIP Landside Improvements Project phases (1–4a) (Section 4.18).

4.1 APPROACH TO THE ENVIRONMENTAL ANALYSIS

An environmental document prepared to comply with the National Environmental Policy Act (NEPA) must consider the context and intensity of the environmental effects that would be caused by, or result from, the Proposed Action and other alternatives under evaluation. Under NEPA, the significance of an effect is used to determine whether an environmental impact statement must be prepared. An environmental document prepared to comply with the California Environmental Quality Act (CEQA) must identify the significance of the environmental effects of a proposed project. A "[s]ignificant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project (State CEQA Guidelines California Code of Regulations [CCR] Section 15382).

4.1.1 SECTION CONTENTS

Sections 4.2 through 4.17 of this EIS/EIR follow the same general format and are each organized into the following major components:

- **Methodology and Thresholds of Significance:** This subsection describes the methods, process, procedures, and/or assumptions used to formulate and conduct the impact analysis. It also presents the significance criteria (or "thresholds of significance") used to define the level at which an impact would be considered significant in accordance with CEQA. Thresholds may be quantitative or qualitative; they may be based on agency or professional standards or on legislative or regulatory requirements that are relevant to the impact analysis. Generally, however, the thresholds of significance used are derived from Appendix G of the State CEQA Guidelines, as amended; NEPA, where defined; factual or scientific information and data; and regulatory standards of Federal, state, regional, and local agencies. These thresholds also include the factors taken into account under NEPA to determine the significance of the action in terms of the context and the intensity of its effects.

- **Environmental Impacts and Mitigation Measures:** This analysis examines the significant impacts that would occur with implementation of the Proposed Action or an alternative under consideration. Impacts and mitigation measures are numbered sequentially in each section, with mitigation measures corresponding to the impact being addressed. For instance, impacts in Section 4.2, "Agricultural Resources," are numbered Impact 4.2-a, and Mitigation Measure 4.2-a corresponds with Impact 4.2-a. An impact statement precedes the discussion of each impact. The discussion that follows the impact statement includes substantial evidence to support the stated conclusion.

  Many of the potential impacts that may result from implementation of the action alternatives would be temporary effects resulting from construction activities, including hauling of borrow material and the movement of heavy construction equipment. However, impacts related to most agricultural land conversion; modification and loss of habitats, including fill of waters of the United States; and disturbance of cultural resources would be either short-term or permanent long-term effects.

  The impacts of each alternative are compared to the impacts of the Proposed Action at the end of each impact discussion in this chapter, and are described as "similar," "greater," "lesser," or "currently unknown."

Following each discussion of a significant or potentially significant impact, mitigation measures are provided to avoid, minimize, or reduce the significant or potentially significant impacts to a less-than-significant level, where available and feasible. In accordance with California Public Resources Code (PRC) Section 21081.6(b), mitigation measures must be fully enforceable through permit conditions, agreements, other legally binding instruments, or by incorporating the measures into the project design. CCR Section 15370 of the State CEQA Guidelines defines mitigation as:

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing impacts by limiting the degree of magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operation during the life of the action; or
- compensating for the impacts by replacing or providing substitute resources or environments.

Mitigation measures, beyond those adopted for the Phase 1–4a Projects, are not required for impacts identified under the No-Action Alternative because, under the No-Action Alternative, no Phase 4b Project would be approved and the project proponent(s) would not be required to obtain permits or enter into agreements associated with the Phase 4b Project. Additionally, USACE would not issue permission, permits, or authorizations for the No-Action Alternative, other than those already issued/granted for the Phase 1–4a Projects. For these reasons, mitigation measures are not provided for the No-Action Alternative in Sections 4.2 through 4.17 of this EIS/EIR.

- **Residual Impacts:** This subsection describes which impacts would remain significant following implementation of mitigation measures. For each impact, either the impact would be reduced to a level below the significance threshold (reduced to a less-than-significant level) or it is concluded that feasible mitigation is not available or is insufficient to reduce the impact to a less-than-significant level. When an impact cannot be reduced to a less-than-significant level, it is called a "significant and unavoidable" impact on the environment. Under CEQA, if significant and unavoidable impacts remain, an agency may approve a project if it finds, pursuant to California PRC Section 21081, (i) that the agency has considered and approved all feasible mitigation measures; (ii) that any alternative that would reduce the severity of the significant unavoidable impacts is infeasible; and (iii) that the overriding economic, social, or other benefits of the project outweigh the significant impacts.

4.1.2 Terminology Used to Describe Impacts

4.1.2.1 Impact Levels

The EIS/EIR uses the following CEQA terminology to denote the significance of environmental impacts, because CEQA is more stringent than NEPA:

- **No impact** indicates that the construction, operation, and maintenance of the Proposed Action or an alternative under consideration would not have any direct or indirect impacts on the physical environment. It means that no change from existing conditions would result. This impact level does not require mitigation.
- A **less-than-significant impact** is one that would not result in a substantial or potentially substantial adverse change in the physical environment. This impact level does not require mitigation, even if applicable measures are available; however, measures may be recommended to further reduce less-than-significant impacts.

- A **significant impact** is defined by California PRC Section 21068 as one that would cause "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project." Under CEQA, mitigation measures and alternatives to the Proposed Action must be identified, where applicable and feasible, to avoid, minimize, rectify, compensate, or reduce significant impacts to a less-than-significant level.

- A **potentially significant impact** is one that, if it were to occur, would be considered a significant impact as described above; however, the occurrence of the impact cannot be immediately determined with certainty. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Therefore, under CEQA, mitigation measures and alternatives to the Proposed Action must be identified, where feasible, to avoid, minimize, rectify, compensate, or reduce significant impacts to a less-than-significant level.

- A **significant and unavoidable impact** is one that would result in a substantial or potentially substantial adverse effect on the physical environment and that cannot be fully reduced to a less-than-significant level even with implementation of any applicable feasible mitigation. Under CEQA, a project with significant and unavoidable impacts may proceed, but the CEQA lead agency (SAFCA) would be required (i) to conclude in findings that there are no feasible means of substantially lessening or avoiding the significant impact in accordance with State CEQA Guidelines CCR Section 15091(a)(3) and (ii) to prepare a statement of overriding considerations, in accordance with State CEQA Guidelines CCR Section 15093, explaining why the CEQA lead agency has chosen to proceed with the project in spite of the potential for significant impacts on the physical environment.

- An impact may have a level of significance that is too uncertain to be reasonably determined, and would therefore be considered **too speculative for meaningful consideration** in accordance with State CEQA Guidelines CCR Section 15145. Where some degree of evidence points to the reasonable potential for a significant effect, the EIS/EIR may explain that a determination of significance is uncertain, but is still assumed to be "potentially significant," as described above. In other circumstances, after thorough investigation, the determination of significance may still be considered too speculative to be meaningful. This is an effect for which the degree of significance cannot be determined for specific reasons, such as unpredictability of the occurrence or the severity of the impact, lack of methodology to evaluate the impact, or lack of an applicable significance threshold.

It is important to note that under NEPA, there are no specific thresholds of significance and that environmental effects are analyzed based on their context and intensity. Because this EIS/EIR is a joint NEPA/CEQA document, the CEQA thresholds have been applied because they are more stringent. To comply with NEPA, however, the context and intensity of the environmental effects were considered for each impact mechanism.

4.1.2.2 IMPACT MECHANISMS

Mechanisms that could cause impacts are discussed for each issue area. General categories of impact mechanisms are project construction and activities related to future operations and maintenance, as described in Chapter 2, "Alternatives."

Under NEPA, the effects of the Proposed Action and alternatives under consideration, including the No-Action Alternative, are determined by comparing effects between alternatives and against effects from the No-Action Alternative. Under CEQA, the environmental impact analysis compares the Proposed Action and alternatives under consideration, including the No-Project Alternative (referred to in this EIS/EIR as the No-Action Alternative), to existing conditions, defined at the time when the notice of preparation was published (November 5, 2009). Consequently, baseline conditions differ between NEPA and CEQA. Under NEPA, the No-Action Alternative (i.e., expected future conditions without the project) is the baseline to which the action alternatives are compared, and the No-Action Alternative is compared to existing conditions. Under CEQA, existing conditions are the baseline to which all alternatives are compared.

Project impacts are effects that are categorized, pursuant to NEPA and CEQA, to describe the context and intensity. Project effects fall into the following categories:

- A **temporary impact** would occur only during construction. The environmental analysis addresses potentially significant impacts from the direct impact of construction at the project site, direct impact associated with site development, and indirect construction impacts associated with fill and wetland construction activities and construction traffic.
- A **short-term impact** would last from the time construction ceases to within 3 years following construction.
- A **long-term impact** would last longer than 3 years following construction. In some cases, a long-term impact could be considered a permanent impact.
- A **direct impact** is an impact that would be caused by an action and would occur at the same time and place as the action.
- An **indirect impact** is an impact that would be caused by an action but would occur later in time or at a distance that is removed from the project area, but is reasonably foreseeable, such as growth-inducing effects and other changes related to changes in land use patterns and related effects on the physical environment.
- A **residual impact** is an impact that would remain after implementation of mitigation.
- A **cumulative impact** is an impact that is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project, even if individually limited, are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

If it approves the Proposed Action, the SAFCA Board of Directors will adopt a mitigation monitoring and reporting program (MMRP) at the time that it certifies the EIR, in accordance with California PRC Section 21081.6(a). The purpose of the MMRP is to ensure that the mitigation measures adopted by SAFCA as part of project approval will be complied with during project construction and implementation. The MMRP will identify each of the mitigation measures and describe the party responsible for monitoring and reporting, the timeframe for implementation, and the program for monitoring compliance.

The SAFCA Board of Directors will also be required to adopt findings with respect to each significant impact of the project (California PRC Section 21081).

4.1.3 Summary of Previous NEPA and CEQA Analyses of Borrow Sites

As noted in Section 2.3.3.4, "Borrow Sites," construction of the Phase 4b Project would use soil borrow material from a combination of sites analyzed in previous NEPA and CEQA documents, and from proposed new borrow sites analyzed as part of this EIS/EIR. The new sites include the South Fisherman's Lake Borrow Area, West Lakeside School Site, Natomas Unified School District, and Triangle Area Borrow Area. These sites are analyzed in Sections 4.2 through 4.17 of this EIS/EIR.

The following sites have been analyzed in previous NEPA and CEQA documents because they were identified as potential sources of borrow material for the Phase 3 and 4 Projects: Fisherman's Lake Borrow Area (includes Natomas Boot/ Bollinger), Krumenacher, and Twin Rivers Unified School District stockpile.

As previously discussed in Section 1.1.4, "Documents Incorporated by Reference," NEPA encourages incorporation by reference under the Council on Environmental Quality (CEQ) regulations, and the State CEQA Guidelines allow for incorporation by reference where project-specific analysis is tiered from previous analysis. **Table 4.1-1** provides a citation to the previous environmental documents that include discussions of these borrow

sites. Because these borrow sites have been included in the project description for the overall NLIP Landside Improvements Project (at a program level) and in previous project phases (at a project level), the proposed use of these borrow sites has informed the environmental impact analyses in this EIS/EIR for appropriate impact topics. Accordingly, analysis of these sites in this EIS/EIR is limited to impacts not previously covered, which are unique to the Phase 4b Project.

Table 4.1-1
Borrow Site Project Description Information Contained in Previous NEPA and CEQA Documents for Previous Project Phases

Borrow Site/Area	Citation	Discussion
Phase 2 EIR		
Fisherman's Lake Borrow Area	SAFCA 2007: 2-9	Described in Section 2.2.2, "Borrow Sites," as a preferred borrow site for the 2010 construction phase (later named the Phase 4 Project)
Fisherman's Lake Borrow Area	SAFCA 2007:2-33	Identified as a source of borrow material for the improvements to Sacramento River east levee Reaches 4B–20A (i.e., the Phase 3 and 4 Projects)
Phase 2 EIS		
Fisherman's Lake Borrow Area	USACE 2008: 2-14	Described as a preferred borrow site for the 2010 construction phase (later named the Phase 4 Project)
Fisherman's Lake Borrow Area	USACE 2008:2-33	Identified as a source of borrow material for the improvements to Sacramento River east levee Reaches 5A–20A (i.e., the Phase 3 and 4 Projects)
Phase 3 EIS and EIR (citations below correspond to the joint DEIS/DEIR prepared for the Phase 3 Project)		
Krumenacher	USACE and SAFCA 2009a:2-30	Identified in Table 2-2, "Potential Borrow Sites"
Twin Rivers Unified School District stockpile	USACE and SAFCA 2009a:2-30	Identified in Table 2-2, "Potential Borrow Sites"
Phase 4a EIS and EIR (citations below correspond to the joint DEIS/DEIR prepared for the Phase 4a Project)		
Fisherman's Lake Borrow Area	USACE and SAFCA 2009b:2-64	Identified in Table 2-10, "Potential Borrow Sites for the Phase 4a Project"
Krumenacher	USACE and SAFCA 2009b:2-64	Identified in Table 2-10, "Potential Borrow Sites for the Phase 4a Project," as a previously analyzed source
Twin Rivers Unified School District stockpile	USACE and SAFCA 2009b:2-64	Identified in Table 2-10, "Potential Borrow Sites for the Phase 4a Project," as a previously analyzed source

Source: SAFCA 2007, USACE 2008, USACE and SAFCA 2009a, and USACE and SAFCA 2009b

Because the Phase 4b Project may rely on approved borrow capacity from the previously analyzed borrow sites identified above, the Phase 4b Project would indirectly contribute to impacts associated with the Phase 2, 3, and 4a Projects.

4.2 AGRICULTURAL RESOURCES

4.2.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.2.1.1 METHODOLOGY

Evaluation of the project's potential impacts on agricultural resources was based on a review of the planning documents pertaining to the Phase 4b Project study area, including goals and policies from the *Sutter County General Plan* (Sutter County 1996), the *Sacramento County General Plan* (Sacramento County 1993), Federal plans and regulations relating to the Sacramento County Airport System (SCAS) and Federal Emergency Management Agency (FEMA), soil surveys of Sutter and Sacramento Counties (National Resources Conservation Service [NRCS] 1988, 1993), and consultation with appropriate agencies. In addition, the California Department of Conservation (DOC) (DOC 2008) Important Farmland maps and California Land Conservation Act (commonly known as the Williamson Act [California Government Code Section 51200 et seq.]) maps for Sutter and Sacramento Counties were used to determine the agricultural significance of the lands on the project area.

For purposes of this analysis, it was assumed that reclamation of borrow sites by returning the topsoil layer to the site would not adversely affect a site's long-term agricultural productivity and, therefore, its status as Important Farmland under the Important Farmland Mapping and Monitoring Program (FMMP) would not be changed permanently. This assumption would not apply to those sites that would be converted to non-agricultural habitat (e.g., woodlands, as opposed to row crops that can be used for foraging habitat). Non-agricultural mitigation sites would be preserved as habitat in perpetuity, permanently affecting their long-term agricultural productivity and status as Important Farmland.

4.2.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to agricultural resources if they would do any of the following:

- convert Important Farmland (i.e., Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to nonagricultural use;
- involve other changes in the existing environment which, due to their location or nature, could result in conversion of Important Farmland to nonagricultural use or conversion of forest land to non-forest use;
- conflict with existing zoning for agricultural use or a Williamson Act contract;
- conflict with existing zoning for, or cause rezoning of, forest land (as defined in California Public Resources Code Section 12220[g]), timberland (as defined in California Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by California Government Code Section 51104[g]); or
- result in the loss of forest land or conversion of forest land to non-forest use.

A review of the forestry and timber maps prepared by the California Department of Forestry and Fire Protection as part of the Fire and Resource Assessment Program's 2003 Forest and Range Assessment indicates that the land cover in the Natomas Basin, including the Phase 4b Project area, consists overwhelmingly of agriculture, with urban land limited to the southern portion of the Basin, and some herbaceous land located along the NEMDC

(California Department of Forestry and Fire Protection 2003). Because the Basin does not include forest land or timberland, the Phase 4b Project would not conflict with existing zoning for either land category or result in the loss or conversion of these lands. These issues are therefore not addressed further in this EIS/EIR.

4.2.2 IMPACTS AND MITIGATION MEASURES

Impact 4.2-a: Conversion of Important Farmland to Non-agricultural Uses

Table 4.2-1 summarizes the Phase 4b Project's potential impacts to Important Farmland. Loss and conversion of agricultural lands on a cumulative basis is addressed in Chapter 5, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements."

Table 4.2-1
Important Farmland Conversion – Phase 4b Project

Project Component/Location	No-Action Alternative	Adjacent Levee Alternative (Proposed Action) (Acres)	Fix-in-Place Alternative (Acres)
Permanent Conversion			
Sacramento River east levee (adjacent levee footprint, seepage berm, and O&M/utility corridor)	-	27.58	25.80
Natomas Cross Canal (Vestal Drain and Morrison Canal)	-	89.59 [1]	89.59 [1]
Pleasant Grove Creek Canal (maximum Phase 4b Project footprint increment; adding to 60 acres addressed in the Phase 3 EIS and EIR)	-	33.71	33.71
Natomas East Main Drainage Canal North (limit of construction)	-	64.63	64.63
West Drainage Canal (maximum footprint)	-	44.57 [2]	44.57 [2]
Riego Road Canal relocation	-	6.43 [3]	6.43 [3]
Detention basin creation at Triangle Properties Borrow Area	-	148.35	148.35
Brookfield Borrow Site marsh conversion	-	203.00	203.00
Chappell Drain and Ditch improvement		27.80	27.80
Potential woodland plantings on TNBC preserves and at other available sites within the Natomas Basin	-	32.00	30.00
Total Permanent Conversion	**-**	**677.66**	**673.88**
Temporary Conversion [4]			
South Fisherman's Lake Borrow Area	-	214.00	214.00
Triangle Properties Borrow Area (excluding detention basins)	-	141.65	141.65
Total Temporary Conversion	**-**	**355.65**	**355.65**

Notes: O&M = operations and maintenance

[1] Important Farmland converted by the relocation of the Morrison Canal and Vestal Drain would include 33.41 acres converted within the new alignments and 56.18 acres that are assumed to be unfarmable remnants created by the relocation of the canal and drain. Two remnants associated with the Vestal Drain would amount to 21.36 acres and 19.72 acres located in approximately 280-foot-wide strips between the relocated drain and the NCC south levee. Two remnants associated with the Morrison Canal would amount to a 2.75-acre piece located between SR 99, Howsley Road, a farm house, and the relocated canal; and a 12.35-acre and approximately 280-foot-wide strip located between the relocated canal and the NCC south levee.

[2] The existing West Drainage Canal would be filled and could potentially be returned to cultivation, partially compensating for the loss of farmland; however, the suitability of the abandoned canal for cultivation is uncertain and the status of the land as Important Farmland would be determined by the California Department of Conservation. The worst case, namely, that the abandoned and filled canal would not be classified as Important Farmland, is presented here.

[3] The existing Riego Road Canal would be filled in and covered by the expanded NEMDC west levee.

[4] Temporary conversion of Important Farmland; borrow sites would be reclaimed and returned to agricultural uses.

Source: Data compiled by AECOM in 2009

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities associated with the Phase 4b Project would occur; therefore, there would be no conversion of any Important Farmland. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of a levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. A levee failure along the Sacramento River east levee could result in scouring of agricultural land and the long-term loss of topsoil in areas near a levee breach. This could result in a permanent loss of Important Farmland in those areas. Such a loss is evident at the locations of past levee failures, for example on the Feather River above Star Bend in Yuba County, where a large dense stand of willow riparian scrub grows in sediments deposited by floodwaters following the scouring of the agricultural soil by the force of in-rushing water. Such losses are typically limited to localized areas within several hundred feet of a levee breach. (The indirect effects of lack of flood risk reduction on urban development and Important Farmland conversion have been addressed as part of the NLIP cumulative and growth-inducing impact analyses (see Chapter 5, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements") The effects of a single or isolated levee failure on the permanent loss of Important Farmland would be localized at the point of the levee breech and would be less than significant. Simultaneous levee failures in more than one location in the perimeter levee system would have a more widespread effect. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Important Farmland mapping for the Natomas Basin is shown in **Plate 3-1** and Important Farmland classifications are described in detail in Section 3.2, "Agricultural Resources." Nearly all of the agricultural lands within the footprint of flood damage reduction facilities are classified as Prime Farmland, Farmland of Statewide Importance, or Farmland of Local Importance. **Table 4.2-1** shows the potential maximum acreage of Important Farmland that would be permanently converted to nonagricultural uses with project implementation. This conversion includes the levee improvements that would occur within a corridor along Sacramento River east levee Reach A:16–20 (see description in Section 2.3.3.2, "Sacramento River East Levee," and **Plates 2-7a** and **2-7b**). These improvements would include the footprint of the adjacent levee, seepage berms that could be up to 300 feet wide, an O&M corridor, a utility corridor, and in-Basin woodland plantings to compensate for loss of woodlands that would be removed for levee construction. The Lower Dry Creek woodland planting area, where up to 40 acres of woodland would be preserved or created, does not contain Important Farmland. As discussed in Chapter 2, "Alternatives," seepage berms would only be required in select locations along the levee, depending upon final project design; therefore, the width of the corridor adjacent to the new adjacent levee may be narrower than assumed here for purposes of worst-case analysis. No farmland would be converted in the corridor along American River north levee Reach I:1–4.

As shown in **Table 4.2-1**, levee and canal improvements would also convert Important Farmland along the west levees of the PGCC and NEMDC North, along the NCC south levee (Vestal Drain and Morrison Canal relocations), and at the West Drainage Canal (a portion of which would be realigned, as described in Section 2.3.3.3, "Irrigation and Drainage Components"). The widening and extension of the Chappell Drain and Ditch in the vicinity of the Brookfield borrow site would also convert Important Farmland. The conversion of these areas to nonagricultural uses would be permanent, and therefore this impact would be significant.

Soil borrow for construction would be obtained from the proposed borrow sites described in Section 2.3.3.4 "Borrow Sites," and shown in **Plate 2-6**. **Table 4.2-1** shows the total acreage of Important Farmland that would be permanently and temporarily converted to nonagricultural uses with project implementation; and **Table 2-23** lists the potential borrow sites, excavation area and depth, post-borrow depth, and proposed post-borrow (reclaimed) use. Borrow sites that are classified as Important Farmland include the South Fisherman's Lake Borrow Area **(Plate 2-7a)**, Brookfield Borrow Site, and the Triangle Properties Borrow Area **(Plate 2-13)**. Only portions of each property, and not the entire property, may ultimately be used for borrow. The decision as to which properties would be used has not yet been made by the project proponent(s). The decision would depend on the quality of borrow material; and avoidance and/or minimization of significant environmental effects, such as damage to cultural resources, tree removal, wetlands, and special-status species habitat. The potential borrow sites in the South Fisherman's Lake Borrow Area include lands classified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. The Brookfield Borrow Site, which would be converted to marsh habitat, is classified as Prime Farmland. The potential borrow sites in the Triangle Properties Borrow Area include lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Reclamation of all borrow sites would be performed in compliance with the California Surface Mining and Reclamation Act (SMARA) and would entail preservation and replacement of the topsoil on these parcels, thus retaining their potential use for agriculture.

Sites that the project proponent(s) intend to reclaim and return to agricultural use (field crops, including rice) are listed in **Table 4.2-1** under "Temporary Conversion." The use of these sites for borrow would not represent a permanent conversion to nonagricultural uses. However, Important Farmland within the Triangle Properties Borrow Area could be permanently converted for use as detention basins if culverts under the PGCC are removed, and the Brookfield Borrow Site would be permanently converted to marsh habitat.

The temporary and permanent conversion of Important Farmland as a result of construction of the Phase 4b Project would be a **significant** impact.

Fix-in-Place Alternative

Temporary and permanent conversion of Important Farmland under the Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action) for all project components, except that the width of the levee improvements in Sacramento River east levee Reach A:16–20 would be reduced by 15 feet, decreasing the acreage of farmland that would be permanently converted under this alternative by approximately one acre, as shown in **Table 4.2-1**.

The temporary and permanent conversion of Important Farmland to flood damage reduction features and borrow uses under the Fix-in-Place Alternative would be a **significant** impact. ***(Similar)***

Mitigation Measure 4.2-a: Minimize Important Farmland Conversion to the Extent Practicable and Feasible

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the measures listed below with regard to Prime Farmland, Unique Farmland, Farmland of Statewide Importance, and Farmland of Local Importance to minimize impacts on these lands.

(a) Borrow sites shall be configured to minimize the fragmentation of lands that are to remain in agricultural use. Contiguous parcels of agricultural land of sufficient size to support their efficient use for continued agricultural production shall be retained to the extent practicable and feasible.

(b) To the extent practicable and feasible, when expanding the footprint of a flood risk reduction facility (e.g., levee or berm) onto agricultural land, the most productive topsoil from the construction footprint shall be salvaged and redistributed to less-productive

agricultural lands in the vicinity of the construction area that could benefit from the introduction of good-quality soil. By agreement between the implementing agencies or landowners of affected properties and the recipient(s) of the topsoil, the recipient(s) shall be required to use the topsoil for agricultural purposes. The project proponent(s) shall implement all terms and conditions of agreements.

(c) During project construction, use of utilities that are needed for agricultural purposes (including wells, pipelines, and power lines) and of agricultural drainage systems shall be minimized so that agricultural uses are not substantially disrupted.

(d) Disturbance of agricultural land and agricultural operations during construction shall be minimized by locating construction staging areas on sites that are fallow, that are already developed or disturbed, or that are to be discontinued for use as agricultural land, and by using existing roads to access construction areas to the extent possible.

(e) To the extent feasible, lands acquired for flood risk reduction purposes shall also be used as mitigation land for NBHCP programs so that agricultural land conversion is minimized.

Responsibility:	Project proponent(s)
Timing:	Minimize loss of Important Farmland and reuse topsoil before construction; and avoid disruption to current agricultural operations during construction

Implementing this mitigation measure would reduce the impact of permanent conversion of Important Farmland to habitat uses under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, but not to a less-than-significant level because no new farmland would be made available, and the productivity of existing farmland would not resume or be improved. Conservation of 1,660 acres of Important Farmland in the Elkhorn Basin of Yolo County across the Sacramento River from the Natomas Basin as described in Section 3.2, "Agricultural Resources," would partially offset the permanent conversion of agricultural lands resulting from the Phase 4b Project. However, because no feasible mitigation is available to fully reduce the impact of permanent conversion of Important Farmland to flood risk reduction features and habitat uses, this impact would remain **significant and unavoidable** for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. ***(Similar)***

Implementing this mitigation measure for borrow sites that are returned to agricultural use would reduce the impacts of temporary conversion of Important Farmland under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, but not to a less-than-significant level. Temporary conversion of Important Farmland for borrow use is considered a **significant and unavoidable** impact in the short term, but a **less-than-significant** impact in the long term because the topsoil layer to the site would be reclaimed. Reclamation thus would not adversely affect a site's long-term agricultural productivity and, therefore, its status as Important Farmland under the FMMP would not be changed permanently. ***(Similar)***

Impact 4.2-b: Conflict with Lands under Williamson Act Contracts

Table 4.2-2 summarizes and compares the project's potential impacts on Williamson Act contracted lands.

Table 4.2-2
Williamson Act Contracted Land Conversion – Phase 4b Project

Project Component/Location	No-Action Alternative	Adjacent Levee Alternative (Proposed Action) (Acres in Active/ Nonrenewal) [1]	Fix-In-Place Alternative (Acres in Active/ Nonrenewal) [1]
Permanent Conversion			
Sacramento River east levee (adjacent levee footprint, seepage berm, and O&M/utility corridor)	-	0	0
Natomas Cross Canal (Vestal Drain and Morrison Canal)	-	33.67/0 [2]	33.67/0 [2]
Pleasant Grove Creek Canal (maximum Phase 4b Project footprint increment; adding to 60 acres addressed in the Phase 3 EIS and EIR)	-	0	0
Natomas East Main Drainage Canal North (limit of construction)	-	4.57/22.57	4.57/22.57
Riego Road Canal relocation	-	0	0
West Drainage Canal (maximum footprint)	-	3.97/0 [3]	3.97/0 [3]
Detention basins at Triangle Properties Borrow Area	-	0	0
Brookfield Borrow Site marsh conversion	-	0	0
Total Permanent Conversion	-	**42.21/22.57**	**42.21/22.57**
Temporary Conversion			
South Fisherman's Lake Borrow Area	-	0	0
Triangle Properties Borrow Area (excluding detention basins)	-	0	0
Total Temporary Conversion[4]	-	**0**	**0**

Notes: O&M = operations and maintenance
[1] "Active" indicates the property is under contract and the nonrenewal process has not been initiated. "Nonrenewal" indicates that the property owner has filed for nonrenewal and the contract will expire 10 years after the process was initiated.
[2] Lands under Williamson Act contract affected by the relocation of the Morrison Canal and Vestal Drain include 12.71 acres within the new alignments and 20.96 acres that are assumed to be unfarmable remnants created by the relocation of the canal and drain. It is assumed that the remnant properties would no longer meet the requirements for enrollment under the Williamson Act.
[3] The existing West Drainage Canal would be filled in and would potentially be suitable for cultivation; however, the enrollment of any of the land in the Williamson Act would be at the discretion of the property owner.
[4] Potential maximum if all borrow sites are excavated over entire acreage available.
Source: Data compiled by AECOM in 2009

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities associated with the Phase 4b Project would occur; therefore, no Williamson Act contracts would be terminated. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding in the Basin, would result in destruction of agricultural land. If flood damage prevented the continued use of contracted lands for agricultural use, the Williamson Act contract would

potentially be subject to nonrenewal or cancellation. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration.** ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would affect properties under Williamson Act contract in and adjacent to the alignment of the relocated Vestal Drain, Morrison Canal, and West Drainage Canal, and along the widened levee of the NEMDC North. If the Phase 4b Project does not require acquisition of an entire parcel, the contract would be terminated only on the portion of the parcel required for the Phase 4b Project; the remainder of the parcel unaffected by the project would remain under contract. **Table 4.2-2** shows the maximum acreage of lands under Williamson Act contract that would be taken out of contract. Additionally, woodland plantings could affect up to 32 additional acres of Williamson Act contract lands, depending upon the sites selected for woodland creation within the Natomas Basin.

The use of Williamson Act contracted lands as borrow sites would require cancellation of Williamson Act contracts. For lands that would be permanently converted to nonagricultural uses or acquired in fee by the project proponent, notice to DOC is required under the Act, as described under Mitigation Measure 4.2-b, below. Those contracted lands that would be returned to agricultural use, could potentially be reenrolled, providing compatibility standards contained in California Government Code Sections 51238–51238.3 are met.

The temporary and permanent cancellation of lands under Williamson Act contract for flood damage reduction features and borrow uses would be a **significant** impact.

Mitigation Measure 4.2-b: Minimize Impacts on Agricultural Preserve Land and Williamson Act–Contracted Land; Comply with California Government Code Sections 51290–51293; and Coordinate with Landowners and Agricultural Operators

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on under Williamson Act contracts, the project proponent(s) shall implement the measures described below.

(a) The project proponent(s) shall comply with California Government Code Sections 51290–51295 with regard to acquisition of Williamson Act contracted lands as follows:

- The policy of the state, consistent with the purpose of the Williamson Act to preserve and protect agricultural land, is to avoid, whenever practicable, locating public improvements and any public utilities improvements in agricultural preserves. If it is necessary to locate within a preserve, it shall be on land that is not under contract (California Government Code Section 51290[a][b]). More specifically, the basic requirements are:
  - Whenever it appears that land within a preserve or under contract may be required for a public improvement, the public agency or person shall notify the DOC and the city or county responsible for administering the preserve (California Government Code Section 51291[b]).
  - Within 30 days of being notified, DOC and the city or county shall forward comments, which shall be considered by the public agency or person (California Government Code Section 51291[b]).
- The contract shall be terminated when land is acquired by eminent domain or in lieu of eminent domain (California Government Code Section 51295).

- DOC and the city or county shall be notified before project completion of any proposed substantial changes to the public improvement (California Government Code Section 51291[d]).
- DOC shall be notified within 10 working days upon completion of the acquisition (California Government Code Section 51291[c]).
- If, after acquisition, the acquiring public agency determines that the property will not be used for the proposed public improvement, before returning the land to private ownership, DOC and the city or county administering the involved preserve shall be notified. The land shall be reenrolled in a new contract or encumbered by an enforceable restriction at least as restrictive as that provided by the Williamson Act (California Government Code Section 51295).

(b) The project proponent(s) shall coordinate with landowners and agricultural operators to sustain existing agricultural operations, at the landowners' discretion, within the project area until the individual agricultural parcels are needed for project construction.

(c) Properties that were under Williamson Act contract prior to conversion for borrow use and that are owned or acquired by the project proponent(s) shall be reenrolled under Williamson Act contract upon reclamation to agricultural use.

Responsibility:	Project proponent(s)
Timing:	Comply with policies regarding the Williamson Act before and during construction; coordinate with landowners and agricultural operators before construction; and reenroll Williamson Act contracted-lands upon reclamation of borrow sites

Implementation of this mitigation measure would potentially reduce the impacts from temporary conversion of Williamson Act–contracted lands used as borrow sources under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, but not to a less-than-significant level, because the project proponent(s) has no regulatory authority over ensuring that parcels are reenrolled. No feasible mitigation is available to lessen or fully avoid the permanent loss of land under Williamson Act contracts converted to nonagricultural use within the flood damage reduction features footprint. For these reasons, this impact would remain **significant and unavoidable**. ***(Similar)***

4.2.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative; impacts of permanent agricultural land loss due to levee failure would remain uncertain, depending on the location and number of levee breeches. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration.

The implementation of required mitigation measures would partially reduce the impacts of permanent and temporary conversion of Important Farmland to nonagricultural uses, temporary conversion of lands in Agricultural Preserves, and loss of lands under Williamson Act contracts; however, there is no feasible mitigation available that would fully reduce or avoid these losses. Therefore, residual significant and unavoidable impacts would occur under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.

4.3 LAND USE, SOCIOECONOMICS, AND POPULATION AND HOUSING

4.3.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.3.1.1 METHODOLOGY

The Phase 4b Project was evaluated in the context of adopted land use plans and policies. State, regional, and local land use plans and policies contained in adopted planning documents pertaining to the Phase 4b Project site were reviewed, including the *Sutter County General Plan* (Sutter County 1996) and zoning code, *Sacramento County General Plan* (Sacramento County 1993) and zoning code, *City of Sacramento 2030 General Plan* (City of Sacramento 2009a), the *Sacramento International Airport Master Plan* (Airport Master Plan) (Sacramento County Airport System 2007), the *Sacramento International Airport Land Use Compatibility Plan* (ALUCP), the *Natomas Basin Habitat Conservation Plan* (NBHCP), and field review and consultation with appropriate agencies. SAFCA, acting as a joint powers authority pursuant to the Joint Exercise of Power Act (California Government Code 6500 et seq.) and the SAFCA Act (California Water Code App. Section 130-1 et seq.), must consider relevant Federal and state land use policies, but is immune from compliance with local laws, regulations, and ordinances. Although exempt, SAFCA has substantially complied with adopted regional and local plans, policies, and ordinances applicable to the NLIP. Nevertheless, this EIS/EIR provides relevant local plans and policies in order to describe the land use planning and policy context in which the project exists and how local agency plans and policies address resource issues in the NLIP area, including the Phase 4b Project area, and because if USACE implements the Phase 4b Project, USACE would be bound by all regional and local laws and regulations.

The Phase 4b Project was also evaluated for potential impacts related to socioeconomics (required under NEPA), population and housing using data from the 2000 U.S. Census, and a review of land use surveys of the Phase 4b Project area.

4.3.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to land use, socioeconomics, and population and housing if they would do any of the following:

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental impact;
- conflict with any applicable habitat conservation plan or natural community conservation plan;
- physically divide an established community;
- displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

4.3.2 IMPACTS AND MITIGATION MEASURES

Impact 4.3-a: Inconsistency with Airport Master Plan, Airport Comprehensive Land Use Plan, and Airport Wildlife Hazard Management Plan

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly conflict with adopted Airport plans. This alternative would be **consistent** with adopted Airport plans. *(Lesser)*

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. In the event that a major flood event affects Airport operations, the Sacramento County Board of Supervisors has approved a *Continuity of Airport Operations Flood Contingency Plan* that would transfer limited commercial transport operations to Mather Field (Sacramento County Board of Supervisors 2008). Consistency of the No-Action Alternative with the continued implementation of Airport plans would depend on the location of any future levee failure and the extent of subsequent flooding. Assuming that the Airport is still operational after levee failure, Airport north bufferlands could be temporarily altered from managed grassland and idle fields to marsh conditions, a land use considered to be incompatible near airports. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential inconsistency is considered **too speculative for meaningful consideration**. *(Currently Unknown)*

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Sacramento International Airport Master Plan

The existing alignment of the West Drainage Canal is located on Airport property, and the proposed realignment is located on property that is planned for acquisition by the Airport as part of the Phase 1 (2007–2013) Airport Master Plan implementation. The Airport Master Plan does not include any planned improvements on the property where the West Drainage Canal would be realigned and the footprint of the proposed Phase 4b Project flood reduction facilities would not interfere with implementation of future phases of the Airport Master Plan. Implementation of the Phase 4b Project would be beneficial to completion of the Airport Master Plan because future Airport improvements would be dependent upon completion of flood damage reduction improvements for the Natomas Basin.

The Natomas Levee Class 1 Bike Trail Project is conceptual at this stage and no alignment has been selected; however, it is intended that the bike trail would generally follow the Natomas Basin perimeter levee system (**Plate 2-19**). If it is infeasible for the bike trail to be placed on the levee south of the Airport, then the bike trail alignment would potentially encroach upon Airport property adjacent to the levee. The Natomas Levee Class 1 Bike Trail Project is considered **potentially inconsistent** with the Airport Master Plan because of this potential encroachment. The final determination as to whether the Bike Trail would be an allowed use on Airport property would rest with the Airport Land Use Commission, SCAS, and the FAA.

Sacramento International Airport Land Use Compatibility Plan

The Airport Safety Zones (Overflight Zone and Approach-Departure Zone), defined by the Sacramento International Airport Land Use Compatibility Plan (ALUCP) (Sacramento Area Council of Governments [SACOG] 1994) and the Airport Perimeter B (the area within a 10,000-foot radius from the Airport Operations Area) shown in **Plate 1-7**, would overlap with the Phase 4b Project footprint, specifically with the proposed Natomas Levee Class 1 Bike Trail Project, West Drainage Canal realignment, and West Drainage Canal bank improvements.

As described above, the Natomas Levee Class 1 Bike Trail Project is conceptual at this stage and no alignment has been selected; however, it is intended that the bike trail would generally follow the Natomas Basin perimeter levee system (**Plate 2-19**). The Overflight Zone (Airport Perimeter B) would overlap with the proposed Natomas Levee Class I Bike Trail Project in Reach B–C:4A–11B and the Approach-Departure Zone would overlap with the Natomas Levee Bike Trail Project in Reach C:4A–4B and B:11A–11B of the Sacramento River east levee. The Approach-Departure Zone is the more restrictive zone with respect to compatible land uses. According to the ALUCP Land Use Compatibility Guidelines for Safety, some recreational uses are compatible in the Approach-Departure Zone, including golf courses, provided that the use does not result in a concentration of more than 25 persons per acre. While the Land Use Compatibility Guidelines for Safety consider streets, roads, and highways to be compatible in both Safety Zones, the Guidelines do not address bicycle paths or trails (SACOG 1994). The final determination of consistency with the ALUCP will be made by the Airport Land Use Commission based on the specific bike trail alignment selected. Because the proposed Natomas Levee Class I Bike Trail would intensify land use in an area where public safety is of critical concern to SCAS and the FAA, the Natomas Levee Class 1 Bike Trail Project is considered **potentially inconsistent** with the ALUCP.

Wildlife Hazard Management Plan

The *Wildlife Hazards Management Plan* notes that agricultural crops and open water are the primary wildlife attractants within the Airport Perimeter B; however, according to the ALUCP Land Use Compatibility Guidelines for Safety, field and row crops, open space and natural areas, and natural water areas would be compatible in the Approach-Departure Zone, provided the use does not present a bird hazard (SACOG 1994). (SCAS 2007). Realignment of the portion of the existing West Drainage Canal located immediately south of I-5, would move that portion of the canal farther from the Airport Operations Area; however, the realigned portion of the canal would remain in the Approach-Departure Zone and within Perimeter B. Additionally, the relocated alignment would be approximately 0.25-mile longer than the existing alignment, and slope flattening of the bank to a 3:1 slope and the creation of benches for planting of tules would increase open water within the Approach-Departure Zone and Airport Perimeter B. The increase in open water along with the creation of benches for planting of tules would potentially create additional habitat for hazardous wildlife. (See Impact 4.16-f, "Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport.") The project proponent(s) would work with SCAS to design the relocated and improved West Drainage Canal to minimize new hazardous wildlife attractants; therefore, the Phase 4b Project would be **consistent** with the *Wildlife Hazards Management Plan*.

Impact Summary

The Phase 4b Project would be **potentially inconsistent** with the Airport Master Plan because the Natomas Levee Class 1 Bike Trail Project could potentially encroach upon Airport Property; and with the ALUCP because the Natomas Levee Class 1 Bike Trail Project would be a potentially incompatible land use within Airport Perimeter B and the Approach-Departure Zone. The Phase 4b Project would be **consistent** with the *Wildlife Hazards Management Plan* because the project proponent(s) would work with SCAS to ensure that the design of the relocated and improved West Drainage Canal does not result in a an increase in wildlife attractants. ***(Similar)***

Mitigation Measure 4.3-a: Implement Mitigation Measure 4.16-g, "Consult with SCAS and the FAA during Design of the Proposed Natomas Levee Class I Bike Trail to Implement Appropriate Airport Safety Precautions"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Sacramento County Department of Transportation (SacDOT), Sutter County, and the City of Sacramento shall consult with SCAS and the FAA to ensure that the alignment of the Natomas Levee Class I Bike Trail is compatible with the Airport Master Plan and the ALUCP, and that applicable regulations and safety precautions are considered and built into construction of the proposed Natomas Levee Class I Bike Trail. These safety precautions shall include project elements that would reduce opportunities for hazards to the Airport and the public, and may include features such as fencing, increased security personnel, and special consideration of alignment and parking areas near the Airport. The Natomas Levee Class I Bike Trail shall not be opened for use until these elements are completed.

Responsibility:	SacDOT, Sutter County, and the City of Sacramento
Timing:	Before the start of construction of the proposed Natomas Levee Class I Bike Trail

SacDOT is responsible for implementing this mitigation measure, which would ensure compatibility of the bike trail with the Airport Master Plan and the ALUCP, and reduce the potential for the Natomas Levee Class I Bike Trail Project to pose an aircraft safety hazard. Site-specific (project-level) impacts of the bike trail would be assessed pursuant to CEQA requirements when the specific alignment has been selected and designed, separate from this EIS/EIR. Any such necessary environmental review would be completed before implementation of the bike trail. The proposed Natomas Levee Class I Bike Trail falls under the jurisdiction of Sacramento (SacDOT) and Sutter Counties and the City of Sacramento, and the final determination as to whether the bike trail would be an allowed use on Airport property would rest with the Airport Land Use Commission, SCAS, and the FAA. Therefore, neither USACE nor SAFCA, as the project proponent(s) would have control over the timing or implementation of the mitigation measure. Thus, this impact would remain **significant and unavoidable**. ***(Similar)***

Impact 4.3-b: Inconsistency with the Natomas Basin Habitat Conservation Plan

Consistency of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative with the NBHCP is summarized below. Refer to Impact 4.7-1 in Section 4.7, "Biological Resources," for a detailed discussion of the project's potential physical direct and indirect impacts to biological resources related to implementation of the NBHCP.

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, without Phase 4b Project levee improvements, vegetation removal from the waterside of the levee would be required to conform to USACE guidance regarding levee encroachments, eliminating habitat for several species covered by the NBHCP, including Swainson's hawk. This habitat supports the majority of Swainson's hawk nest sites in the Natomas Basin. However, the NBHCP was put in place to promote biological conservation to compensate for habitat loss largely brought about by urban development in the Natomas Basin. Without flood risk reduction provided by the Phase 4b Project, restrictions would be placed on new urban development and remaining habitat would not be at risk for conversion due to development. For these reasons, the No-Action Alternative would not directly conflict with implementation of the NBHCP. This alternative would be generally **consistent** with the NBHCP. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. The Natomas Basin Conservancy's (TNBC's) reserve infrastructure would be subject to damage in the event of levee failure; however, the extent of such damage is uncertain. Without flood protection provided by the levee improvements, restrictions would be placed on new urban development and remaining habitat would not be at risk for conversion due to development. Because there would be no habitat loss due to urban development, implementation of this alternative would not directly conflict with the implementation of the NBHCP. Impacts of the No-Action Alternative on special-status species are addressed in Section 4.7, "Biological Resources." This alternative would be generally **consistent** with the NBHCP. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action)

Plate 1-8 shows the location of TNBC lands. The Adjacent Levee Alternative (Proposed Action) could encroach onto 6.56 acres of TNBC reserves on the Bolen property located along the West Drainage Canal, and the Betts property located along the NEMDC North. The encroachment onto these properties could potentially threaten the viability of populations of certain covered species, reduce the effectiveness of the NBHCP's conservation strategy, and adversely affect attainment of the goals and objectives of the NBHCP, which could jeopardize successful implementation of the NBHCP. The Adjacent Levee Alternative (Proposed Action) would not result in the development of land outside the NBHCP permit area, but it would result in land use conversions within the permit area. Land use conversion, however, would not cause a net loss in the habitat values provided by these lands for NBHCP-covered species in the Natomas Basin. Direct and indirect physical habitat impacts of the Adjacent Levee Alternative (Proposed Action) are described in Section 4.7, "Biological Resources." Although there would be a temporal loss of woodlands in the Phase 4b Project area as the replacement woodland plantings mature within 10–15 years, the retention of the extensive mature waterside riparian woodlands coupled with the creation and preservation of landside woodlands would protect potential nesting habitat for special-status birds. Some Swainson's hawk foraging habitat would be temporarily affected by the Phase 4b Project borrow activities; however, much of this would be returned to equivalent or higher-quality Swainson's hawk foraging habitat following borrow activities with the exception of areas that would be converted to marsh or woodland habitat (see Section 2.2.2.4, "Borrow Sites," and Impact 4.7-f, "Impacts on Swainson's Hawk and Other Special-status Birds").

Compensatory habitat creation included in the Phase 4b Project is also part of USACE's and SAFCA's overall programmatic conservation strategy for the NLIP that aims to reconfigure habitat and connective corridors in the Basin at a landscape scale to help achieve NBHCP objectives (see Section 2.3.4, "Habitat Creation and Management"). The collective elements of USACE's and SAFCA's conservation strategy would aid in NBHCP implementation and provide TNBC with an opportunity to improve its overall performance towards the goals of the NBHCP.

However, without proper implementation of habitat creation/preservation and creation of a management plan in consultation with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (DFG), the Adjacent Levee Alternative (Proposed Action) would have the potential to reduce the effectiveness of the NBHCP conservation strategy and adversely affect attainment of its goals and objectives. Thus, the Adjacent Levee Alternative (Proposed Action) would be **potentially inconsistent** with the intent of the NBHCP.

Fix-in-Place Alternative

Impacts to the successful implementation of the NBHCP associated with the Adjacent Levee Alternative (Proposed Action) would also occur under the Fix-in-Place Alternative, with the exception that under this alternative, there would also be extensive removal of riparian vegetation on the waterside of the Sacramento River east levee to conform to USACE guidance regarding levee encroachments. This habitat is used by a variety of

species covered by the NBHCP, and supports the majority of Swainson's hawk nest sites in the Natomas Basin. As described under Impact 4.7-l in Section 4.7, "Biological Resources," the impact of the loss of this vegetation on Swainson's hawks would be significant and may not be fully mitigable. Impacts on nesting habitat for Swainson's hawks in the near term (i.e., before compensation woodland plantings have matured sufficiently to provide replacement nesting habitat) could substantially affect the successful implementation of the NBHCP. Physical direct and indirect impacts of the Fix-in-Place Alternative on biological resources, and mitigation measures required to reduce those impacts, are addressed in Section 4.7, "Biological Resources." The Fix-in-Place Alternative would be **inconsistent** with the NBHCP. ***(Greater)***

Mitigation Measure 4.3-b: Implement Mitigation Measure 4.7-l, "Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement Mitigation Measure 4.7-l, "Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7- h," set forth in Section 4.7, "Biological Resources." In summary, this mitigation measure requires coordination with TNBC, USFWS, and DFG to identify and implement actions to ensure that the project's small encroachment onto TNBC reserves does not jeopardize successful implementation of the NBHCP.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities

With implementation of this mitigation measure, the Adjacent Levee Alternative (Proposed Action) would be **consistent** with the NBHCP because the referenced mitigation measures would minimize impacts to woodland habitats, jurisdictional waters, and special-status species; provide for habitat improvements for Swainson's hawk and giant garter snake; and compensate for loss of habitat. Habitat improvements of the Phase 2, 3, and 4a Projects would minimize the Phase 4b Project's adverse effects on landside woodland habitat because the amount of landside woodlands that would be created and preserved as part of the Phase 2, 3, and 4a Projects along with the Phase 4b Project would result in an increase of landside woodlands in the Natomas Basin.

Under the Fix-in-Place Alternative, these replacement woodlands would not be adequate to compensate for the extensive loss of mature waterside vegetation and would not compensate for loss of SRA habitat along the NEMDC and Sacramento River east levee Reach A:16–20. Therefore, the Fix-in-Place Alternative would remain **inconsistent** with the NBHCP. This impact would be **significant and unavoidable**. ***(Greater)***

Impact 4.3-c: Inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur. However, compliance with USACE levee vegetation guidance would be required. Under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted, up to six acres of waterside woodlands would be cleared on the upper two-thirds of the levee, adjacent to the Parkway. This vegetation removal would be potentially inconsistent with Parkway policies for uses adjacent to the Parkway that serve to ensure that adjacent uses are sensitive to the Parkway's naturalistic setting and scenic values, and protect the Parkway from negative visual impacts. Physical impacts (as well as mitigation measures to help reduce those impacts) associated with vegetation removal are discussed in Sections 4.7, "Biological Resources," and 4.14, "Visual Resources."

Additionally, Parkway Plan Policy 4.9, copied below, would not be met if the Phase 4b Project is not constructed:

> Flood management agencies should continue to maintain, and improve when required, the reliability of the existing public flood-control system along the lower American River to meet the need to provide a high level of flood protection to the heavily urbanized floodplain along the lower American River consistent with other major urban areas. This effort is expected to include raising and strengthening the levees as necessary to safely contain very high flow in the river (up to 160,000 cubic feet per second) for a sustained period.

As noted above, compliance with USACE levee vegetation guidance would be required under the No-Action Alternative, and could result in up to six acres of waterside woodlands being cleared on the upper two-thirds of the levee, adjacent to the Parkway (under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted). This vegetation removal could affect the American River's classification under the Wild and Scenic Rivers Act. The determination of consistency with the Wild and Scenic Rivers Act rests with the National Park Service, the Federal agency responsible to ensure that the protections under Section 7(a) of the Federal Wild and Scenic Rivers Act are consistently applied on rivers classified as wild and scenic. A consistency determination would need to be requested from the National Parks Service as to whether compliance with USACE's levee vegetation guidance would adversely affect the characteristics qualifying the American River for the national system as required under Section 7(a) of the Wild and Scenic Rivers Act.

Therefore, this alternative would be **potentially inconsistent** with the Parkway Plan and the Wild and Scenic Rivers Act. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee breach along the American River north levee would potentially cause scour damage to the Parkway from the force of the outrushing water. Parkway infrastructure would also be subject to damage in the event of a levee failure; however, the extent of such damage is uncertain. Nonetheless, is it assumed that the Parkway would suffer damage during a levee failure and many of the Parkway Plan's policies would be violated. Similarly, in the event of a levee failure, the classification of the American River under the Wild and Scenic Rivers Act could be jeopardized depending on the magnitude of the event and the resulting damages. A precise determination of consistency is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential inconsistency is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

American River Parkway Plan

Under the Phase 4b Project, no waterside vegetation would be removed from within the Parkway to construct improvements to the American River north levee. Further, construction of cutoff walls and levee slope flattening under the Phase 4b Project would not encroach upon the Parkway. Nonetheless, the Phase 4b Project would be subject to USACE's levee vegetation guidance, which would require the removal of vegetation on the upper two-thirds of the levee, adjacent to the American River Parkway. SAFCA is requesting a variance from this guidance; however, under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted, up to six acres of waterside woodlands would be cleared on the upper two-thirds of the levee, adjacent to the Parkway. This vegetation removal would be potentially inconsistent with Parkway policies for uses adjacent to the Parkway that serve to ensure that adjacent uses are sensitive to the Parkway's naturalistic setting and scenic values, and protect the Parkway from negative visual impacts. Physical impacts associated with vegetation removal are discussed in Sections 4.7, "Biological Resources," and 4.14, "Visual Resources." It should be noted

that compliance with USACE levee vegetation guidance would be required whether or not the Phase 4b Project is approved (hence, the inclusion of this same discussion under the No-Action Alternative).

The Parkway Plan policies also address flood risk reduction and levee protection policies. The Phase 4b Project is consistent with the majority of the land use management, flood risk reduction, and levee protection policies of the American River Parkway Plan. These policies require that flood management agencies maintain and improve the existing flood control system, and manage vegetation in the Parkway to maintain the structural integrity and conveyance capacity of the flood control system, consistent with the need to provide a high level of flood risk deduction (Sacramento County 2008:4-84). In particular, American River Parkway Plan Flood Control Policy 4.10 states:

> Flood control projects, including levee protection projects and vegetation removal for flood control purposes, shall be designed to avoid or minimize adverse impacts on the Parkway, including impacts to wildlife and wildlife corridors. To the extent that adverse impacts are unavoidable, appropriate feasible compensatory mitigation shall be part of the project. Such mitigation should be close to the site of the adverse impact, unless such mitigation creates other undesirable impacts.

The project proponent(s) would comply with the above policy by (1) designing the project to avoid or minimize adverse impacts on the Parkway; (2) to the extent that adverse impacts are unavoidable, incorporating appropriate feasible compensatory mitigation into the project; and (3) locating such mitigation close to the site of the adverse impact, to the extent feasible. (See Sections 4.7, "Biological Resources," and 4.14, "Visual Resources," for a description of impacts and required compensatory mitigation.)

Wild and Scenic Rivers Act

It should be noted that compliance with USACE levee vegetation guidance would be required whether or not the Phase 4b Project is approved (hence, the inclusion of this same discussion under the No-Action Alternative). The Phase 4b Project would not be expected to alter the American River's classification under the Wild and Scenic Rivers Act because no waterside vegetation would be removed along the American River to construct levee improvements, and construction of cutoff walls and levee slope flattening under the Phase 4b Project would not encroach upon the American River or the Parkway.

Impact Summary

The Phase 4b Project would be **consistent** with the American River Parkway Plan because the project design would adhere to the Parkway Plan policies. However, should USACE require removal of waterside vegetation from the American River north levee, the Phase 4b Project would be **potentially inconsistent** with the Parkway Plan, as described for the No-Action Alternative. ***(Similar)*** (See Section 4.7, "Biological Resources," and Section 4.14, "Visual Resources," for the physical impacts that would result from vegetation removal, and the accompanying mitigation measures to help reduce these impacts.)

The Phase 4b Project would be **consistent** with the Wild and Scenic Rivers Act because the Phase 4b Project would not be expected to alter the American River's classification under the Wild and Scenic Rivers Act. However, should USACE require removal of waterside vegetation from the American River north levee, the Phase 4b Project would be **potentially inconsistent** with the Wild and Scenic Rivers Act, as described for the No Action Alternative. ***(Similar)***

Mitigation Measure: No mitigation is available.

Impact 4.3-d: Potential to Physically Divide or Disrupt an Established Community

Table 4.3-1 shows the property acquisitions that would occur under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative.

Table 4.3-1
Phase 4b Project Property[1] Acquisitions

Project Element/Location	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative
Sacramento River east levee Reaches B: 15 and A:16–18B	6 property relocations	None
Sacramento River east levee Reach A:19A–20	1 property relocation	None
American River north levee Reach 1:1–4	None	None
PGCC west levee (Reach E)	None	None
NEMDC North (Reaches F–G)	14 property relocations/demolitions	5–10 property relocations/demolitions
NEMDC South (Reach H)	None	None
Morrison Irrigation Canal relocation (NCC Reach D area)	3 property relocations along the NCC	3 property relocations along the NCC
West Drainage Canal realignment (in Sacramento River east levee Reach B)	1 mobile home relocation	1 mobile home relocation
Triangle Properties, South Fisherman's Lake, and West Lakeside borrow areas	None	None
Total	**25 property relocations/demolitions**	**9–14 property relocations/demolitions**

Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal

[1] As of this writing, USACE had not yet inventoried whether the properties in this table are residences or businesses.

Source: Data provided by USACE in 2010

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to divide or disrupt an established community. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Levee failure would have the potential to destroy residences located on or adjacent to the levee, and to isolate residents from nearby communities. The magnitude of the impact cannot be predicted and would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

The project's potential to physically divide or disrupt an established community relates to the physical division of a community and also the socioeconomic impact of permanently removing existing residences, businesses, and associated structures to accommodate the Phase 4b Project. Additionally, project construction and resulting temporary road closures and detours would temporarily disrupt the community by limiting access to residences and businesses during construction.

Permanent Community Disruption as a Result of Property Acquisition

Design of the Phase 4b Project includes measures to reduce project footprint impacts to residences and businesses, to the extent feasible given levee design and seepage remediation performance requirements. Nonetheless, along the Sacramento River east levee Reaches B:15 and A:16–20, construction of the proposed adjacent levee, seepage berm, and O&M and utility corridors would require removing properties on the landside of the levee (see **Table 4.3-1**). In Reaches B:15 and A:16–18B, some of these properties are on large lots and widely spaced, while others are in closer proximity to neighboring properties; in Reach A:19A–20, properties are located within subdivisions north of the levee.

Along the west levee of NEMDC North, several properties may be removed/demolished, depending upon final engineering design. The relocation of the Morrison Irrigation Canal, south of the NCC south levee, may require removal of several properties. Additionally, one mobile home located on the south side of the West Drainage Canal at Powerline Road may require relocation. Residences in these areas are widely scattered and generally associated with farm complexes.

No properties would be removed within the project footprint along the American River north levee Reach I:1–4, PGCC west levee (Reach E), or NEMDC South (Reach H).

A number of residences, farm complexes, and other non-agricultural land uses are located within the approximately 1,809-acre Triangle Properties Borrow Area. Excavation of borrow material would occur on approximately 290 acres within the Triangle Properties Borrow Area, and no demolition of residences or other non-agricultural uses would occur as part of borrow excavation. Excavation sites within the Triangle Properties Borrow Area would be set back at least 100 feet from existing roads, utilities, and irrigation ditches. No residences or businesses are located within the South Fisherman's Lake or the West Lakeside borrow areas; therefore, there would be no impact related to community division at these borrow areas.

All property acquisitions would be conducted in compliance with Federal and state relocation law, and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 United States Code [USC] Section 4601 et seq.), and implementing regulation, 49 Code of Federal Regulations [CFR] Part 24; and California Government Code Section 7267 et seq., California Code of Civil Procedure Sections 1263.010 to 1263.620 and 1255.010 to 1255.060, California Community and Housing Development Title 25, and State and Caltrans Right-of-Way Manual, Chapter 10. These laws require that appropriate compensation be provided to displaced residential and nonresidential landowners and tenants, and that residents be relocated to comparable replacement housing and receive relocation assistance. This law applies to residential relocations as well as farms and businesses if they would be displaced for any length of time. Refer to Section 3.3, "Land Use, Socioeconomics, and Population and Housing," and Chapter 6, "Compliance with Federal Environmental Laws and Regulations," for more details regarding these regulations.

In summary, implementation of the Phase 4b Project would require a number of property acquisitions, some of which are in established communities and others of which may not be (due to widely scattered residences in mostly rural areas). Regardless of the extent to which these communities are "established," the project's removal

of residences and bnsinesses would disrupt, but would not physically divide, these communities. This impact would be **significant**.

Temporary Community Disruption as a Result of Construction-Related Traffic Impacts

Temporary disruption to the commnnity wonld occur during construction of the Phase 4b Project. Portions of the Phase 4b Project area are located immediately adjacent to the established communities of North and South Natomas, within the City of Sacramento, as well as neighborhood communities along Garden Highway and the Valley View Acres community along the NEMDC. Garden Highway provides primary access to the waterside and landside residences and businesses located along the Sacramento River east levee. Some landside residences and at least one business located along the American River north levee also use Garden Highway for their primary access.

Landside impacts, specifically the installation of a cutoff wall, in the Valley View Acres community, located along the west levee of NEMDC South, were described in the Phase 3 EIS and EIR. Under the Phase 4b Project, proposed work in this community would be limited to waterside erosion control, which would not affect residences because all construction would take place on the waterside of the levee. Thus, the Phase 4b Project would not result in community disruption in the Valley View Acres community.

In Reach A:16–19A of the Sacramento River east levee, approximately 39 residences and one business are located on the waterside of the levee and use Garden Highway for access; the driveways of these residences and businesses wonld remain usable during construction. An apartment complex located on the landside of the levee in Reach A:20 has access from Garden Highway; however, alternate access is available to the apartments from streets to the north.

Approximately six residences are located on the landside of the levee and use Garden Highway for access; the driveways of these residences would be closed during construction. In Reach A:19B–20, approximately 11 residences, a 207-unit condominium complex, and approximately nine businesses are located on the waterside of the levee that use Garden Highway for access. One landside business in Reach A:20 relies on Garden Highway for access. The landside business does not have alternative access; however, a temporary alternative access may be feasible to construct. If alternate access cannot be provided for these residences and businesses that use Garden Highway for access, it may be necessary for residents to relocate for the duration of the construction period, and businesses may need to relocate or suspend business operations for the duration of construction.

The landside lane of Garden Highway would be closed for up to 6 months during project construction to allow for installation of a cutoff wall. The closed portion of Garden Highway would shift along the levee crown as the cutoff wall is installed. In addition, because there may be insufficient room for a two-way haul route at the toe of the existing levee in Reach A:19B–20, the waterside lane of Garden Highway may be used by haul trucks delivering materials to the project sites. This lane would only be open to local traffic, with use of traffic controls. Through-traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. In addition to the closure for cutoff wall construction, Garden Highway would also be closed at several locations, including at the City of Sacramento Sump Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B, to allow for installation of pipes that need to be raised.

This closure of Garden Highway to through-traffic, although temporary, would cause traffic delays for residents traveling to and from North and South Natomas and the vicinity, and in making connections with I-5 and other major travel routes. Businesses such as restaurants, marinas, and boat repair services that use Garden Highway for access could experience reduced activity due to traffic delays, loss of roadside parking, and construction-generated noise and dust. Loss of business activity may result in business relocations or closures, either temporary or permanent. Customers would likely seek out similar businesses in other unaffected areas of Natomas Basin when access to Garden Highway businesses is limited or precluded.

The Garden Highway/Arden-Garden Connector located on the crown of the American River north levee between I-5 and Northgate Boulevard would be closed for up to 6 months to accommodate levee work and modifications to City of Sacramento Sump Pump 58. Through-traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. Along the American River north levee Reach I:1–4, approximately four residences use Garden Highway for access. These affected residents would be required to temporarily relocate if alternate access could not be provided. The altered traffic pattern resulting from the detour around the construction area may have an effect on nearby businesses that would experience a decrease in business activity as a result of reduced drive-by traffic.

In the Triangle Properties Borrow Area, temporary, traffic-related disruptions to residents in the area would occur for the duration of project construction as a result of borrow excavation and hauling in this area. Residences and associated structures would not be removed; however, borrow activities would expose residents to noise, and haul truck traffic could result in dust and delay access in and out of their properties. Borrow activities would temporarily suspend agricultural activities in the portions of the borrow area being excavated. The farming operation may experience loss of economic activity due to the reduced area available for cultivation. No residences or businesses are located within the South Fisherman's Lake Borrow Area or the West Lakeside Borrow Site, thus there would be no requirement for relocations; however, current agricultural operations would be suspended during borrow activities, as described above.

Construction activities along the Sacramento River east levee and American River north levee would cause temporary access disruptions for residents and businesses along Garden Highway, the Garden Highway/Arden-Garden Connector, and within the Triangle Borrow Area; borrow excavation would cause temporary disruption to agricultural operations in the Triangle Borrow Area and the Fisherman's Lake Borrow Area. This would be a **significant impact**.

Fix-in-Place Alternative

Permanent Community Disruption as a Result of Property Acquisition

This alternative would require construction of a landside seepage berm and flattening of the landside levee; the width of the project footprint on the Sacramento River east levee would be approximately 15 feet narrower than the Adjacent Levee Alternative's (Proposed Action's) footprint in most reaches. In Reach A:19A–19B, the levee footprint would be 23–73 feet narrower than the Adjacent Levee Alternative's (Proposed Action's) footprint.

As shown in **Table 4.3-1**, the Fix-in-Place Alternative would result in the removal of fewer residences than would occur with the Adjacent Levee Alternative (Proposed Action). Property relocations/demolitions under this alternative would be limited to the west levee of NEMDC North (Reaches F–G), the Morrison Irrigation Canal relocation (in the NCC Reach D area), and the West Drainage Canal realignment (in Sacramento River east levee Reach B). All property acquisition would be conducted in compliance with Federal and state relocation law, and relocation services would be accomplished in accordance with the regulations cited under the Adjacent Levee Alternative (Proposed Action).

In summary, implementation of the Fix-in-Place Alternative would require a number of property acquisitions, some of which are in established communities and others of which may not be (due to widely scattered residences in mostly rural areas). Regardless of the extent to which these communities are "established," removal of residences and businesses would disrupt, but would not physically divide, these communities. This impact would be **significant**. ***(Lesser)***

Temporary Community Disruption as a Result of Construction-Related Traffic Impacts

Under the Fix-in-Place Alternative, temporary effects of construction, including construction-related traffic impacts, would be similar to the Adjacent Levee Alternative (Proposed Action), and the same businesses and

residences would be affected. However, raising the levee and constructing cutoff walls in the existing levee would require full closure of both lanes of Garden Highway in approximately 1,000-foot-long segments that would move along the levee as construction of each segment is completed. This closure would extend for the duration of the construction season—up to 6 months. Local access for residents and businesses along the Sacramento River east levee in this area would be provided, while through-traffic would be detoured around the construction. Businesses such as restaurants, marinas, and boat repair services that use the Garden Highway for access could experience reduced activity due to traffic delays, loss of roadside parking, and construction; however, loss of business activity may result in closures or relocations, either temporary or permanent. Business customers would likely seek out similar businesses in other unaffected areas of Natomas Basin when access to Garden Highway businesses is limited or precluded.

Impacts along the American River north levee, NEMDC North, NCC, PGCC, and in the Triangle Borrow Area would be the same as described under the Adjacent Levee Alternative (Proposed Action).

Temporary disruptions to access for residents and businesses along Garden Highway and the Garden Highway/Arden-Garden Connector would be a **significant** impact. ***(Greater)***

Mitigation Measure 4.3-d: Notify Residents and Businesses of Project Construction and Road Closure Schedules; and Implement Mitigation Measures 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and 4.10-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) and its primary contractors for engineering design and construction shall implement Mitigation Measures 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and 4.10-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers," set forth in full in Section 4.10, "Transportation and Circulation." Additionally, the following measures shall be implemented; notations are provided to indicate where measures differ depending upon whether the project is implemented by USACE or SAFCA:

a) Provide residents and business owners located adjacent to the construction areas with information regarding construction activities (including road closures, detour information, contact information, and complaint procedures) and a construction timeline, and post the construction schedule on the project proponent's Web site. The schedule shall be updated on a regular basis.

b) Apply the following measures to power line relocations: To the extent that the main electrical power transmission lines and poles serving Garden Highway must be relocated or replaced to accommodate the project, the relocation or replacement shall occur east of the new adjacent levee and in a manner that appropriately accommodates private landside improvements and properties. Existing main electrical power transmission lines and poles on the waterside of the existing Garden Highway levee that do not need to be relocated or replaced to accommodate the project may be left in place. The project proponent(s) will avoid placing utilities on the waterside of the Garden Highway levee, where feasible. Consistent with sound engineering practices that prioritize the following, individual services shall: (1) use existing configurations and facilities, and (2) place any new poles on the landside of Garden Highway, subject to the approval of the Central Valley Flood Protection Board (CVFPB) and any other relevant regulatory public agencies and utility companies. USACE would also need to approve the implementation of this measure if SAFCA implements the project.

c) Implement the following measures before and during construction:

Project Implementation by either USACE or SAFCA

- Provide local residents and businesses with a timeline for the phased completion of the project that indicates the role of the various agencies involved in implementing or permitting the project. The project proponent(s) shall post the construction schedule for the project on the project proponent's Web site. The schedule shall be updated on a monthly basis. In addition, the project proponent(s) shall post a "60-day notice" of planned construction on the project proponent's Web site. "Planned construction" shall not include construction in the event of an emergency or construction necessary to remedy a condition discovered after completion of the project. However, the project proponent(s) shall provide whatever notice is possible under the circumstances to affected, adjacent landowners prior to any emergency or remedial work.

Project Implementation by USACE

- USACE shall conduct a free preconstruction inspection of the property, but only if requested by the affected property owner. The scope of the inspection and documentation shall be determined by project proponent in consultation with the property owner. For property owners who request prior inspections/ documentation, the inspection/documentation must be scheduled prior to the start of construction within the specified reach of the Sacramento River east levee where project construction will commence.

- USACE shall require the contractor(s) to follow the construction specifications, which will include all USACE safety regulations.

Project Implementation by SAFCA

- SAFCA shall give property owners within the project area an informational package advising the property owners that pre-project inspections of their properties are important and that project proponent will conduct a free preconstruction inspection of the property, but only if requested by the affected property owner. The scope of the inspection and documentation shall be determined by SAFCA in consultation with the property owner. For property owners who request prior inspections/documentation, the inspection/documentation must be scheduled prior to the start of construction within the specified reach of the Sacramento River east levee where project construction will commence.

- If requested by a property owner within the project area, SAFCA shall test the owner's domestic well water before and after project construction for the presence of bentonite, concrete, and cement.

- SAFCA shall cooperate with a construction monitoring committee established by local residents and businesses to resolve reasonable complaints regarding the project proponent's or its contractors' construction activities in accordance with this provision. A complaint procedure and hierarchy shall be developed by the committee and the project proponent's Ombudsperson in time to be included in the informational packet referenced in subsection (i), above. In addition, the information packet shall include project proponent's instructions to its contractors regarding appropriate use of Garden Highway. The project proponent(s) shall resolve all complaints pertaining to dangerous activities immediately, and shall resolve all other reasonable complaints in

an expeditious manner.

- SAFCA shall prohibit the use of earth-moving equipment or haul trucks on Garden Highway in conjunction with project construction to the extent feasible.

d) Where a property owner occupies a residence on property to be acquired for the project, SAFCA, as the local sponsor, shall allow up to 12 months, rather that the statutory allowance of 3 months, for the owner to relocate off the property. The 12-month period shall be counted from the first written offer.

e) Provide notice as feasible for emergency construction or remedial construction.

f) Provide assistance for residents and businesses that are required to relocate during the construction period. The project proponent(s) shall compensate residents for reasonable rent and living expenses incurred due to relocation. Residents will have the right to decent, safe, and sanitary housing in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act.

g) Provide 24-hour security patrols for residences and businesses that must be vacated during the construction period.

Responsibility:	Project proponent(s)
Timing:	Before and during the start of construction activities

Implementing these mitigation measures would reduce impacts resulting from temporary community division caused by planned road closures, but not to a less-than-significant level. Because no feasible mitigation measures are available to fully reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable** under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Because of the full closure of the Garden Highway, impacts under the Fix-in-Place Alternative would be more severe. ***(Greater)***

There are no feasible mitigation measures available to fully reduce impacts related to community disruption as a result of removing residences and businesses to a less-than-significant level. This impact would therefore remain **significant and unavoidable** under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Because of the fewer number of residences and businesses that would need to be removed, impacts under the Fix-in-Place Alternative would be slightly reduced compared to the Adjacent Levee Alternative (Proposed Action). ***(Lesser)***

Impact 4.3-e: Displacement of Residences and Businesses

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to displace existing housing or people. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Levee failure would have the potential to destroy residences located on or adjacent to the levee, and to require relocation of residents to nearby communities. The magnitude of the impact cannot be

predicted and would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Project implementation would require removal of residences and business as shown in **Table 4.3-1**.

As noted in Chapter 3, "Affected Environment," the project vicinity has housing stock available for sale and rent. The 2000 Census data indicate that the average vacancy rate for Census Tracts in North Natomas was 12.2% and in South Natomas was 7.0%; and 2007 showed the average rental vacancy rate for North Natomas was 7.0% and for South Natomas was 5.2%. (City of Sacramento 2009b: 5-6). Vacancy rates for the Census Tracts adjacent to the Sacramento River east levee were as high as 18.9%, much higher than the overall rate for South Natomas. Additionally, the downturn in the housing market has resulted in additional inventory of for-sale homes in the area (Long 2008).

The project proponent(s) would minimize the project footprint to avoid residences to the extent feasible (see Chapter 2, "Alternatives"), and all relocations of residents would be conducted in compliance with Federal and state relocation law. Acquisition and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC Section 4601 et seq.), and implementing regulation, 49 CFR Part 24; and California Government Code Section 7267 et seq., California Code of Civil Procedure Sections 1263.010 to 1263.620 and 1255.010 to 1255.060, California Community and Housing Development Title 25, and State and Caltrans Right-of-Way Manual, Chapter 10. These laws require that appropriate compensation be provided to displaced residential and nonresidential landowners and tenants, and that residents be relocated to comparable replacement housing and receive relocation assistance. This law applies to residential relocations as well as farms and businesses if they would be displaced for any length of time. Refer to Section 3.3, "Land Use, Socioeconomics, and Population and Housing," and Chapter 6, "Compliance with Federal Environmental Laws and Regulations," for more details regarding these regulations.

The existing housing stock in the project vicinity has sufficient available and comparable housing for rent and purchase to accommodate displaced residents. Therefore, no new construction of replacement housing would be required to accommodate the relocation of residents and impacts related to housing displacement and relocation of residents are considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

4.3.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, there would be no direct conflict with implementation of adopted Airport plans. In the event of a levee failure, continued implementation of Airport plans would depend on the location of any future levee failure and the extent of subsequent flooding; therefore, consistency with Airport plans is considered too speculative for meaningful consideration under the potential levee failure scenario.

After mitigation, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would be consistent with the ALUCP and the *Wildlife Hazards Management Plan*, but would remain inconsistent with the Airport Master Plan because the Natomas Levee Class 1 Bike Trail Project could potentially encroach upon Airport Property, and Mitigation Measure 4.3-a(1) would be the responsibility of SacDOT and, therefore, outside the project proponent's control. This impact would remain significant and unavoidable.

The No-Action Alternative and Adjacent Levee Alternative (Proposed Action) would be consistent with the NBHCP; however, under the Fix-in-Place Alternative, because of the likely loss of a substantial amount of

nesting habitat for Swainson's hawk, this alternative would remain potentially inconsistent with the NBHCP following mitigation.

Under the No-Action Alternative, compliance with USACE levee vegetation guidance would be required and could result in up to six acres of waterside woodlands being cleared on the upper two-thirds of the levee, adjacent to the Parkway (under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted). This vegetation removal would render the No-Action Alternative potentially inconsistent with the American River Parkway Plan and Wild and Scenic Rivers Act. Because mitigation cannot be required for the No-Action Alternative, this impact would remain significant and unavoidable. In the event of a levee failure, continued implementation of the American River Parkway Plan and the American River's designation under the Wild and Scenic Rivers Act would depend on the location of any future levee failure and the extent of subsequent flooding; therefore, consistency with the American River Parkway Plan and Wild and Scenic Rivers Act is considered too speculative for meaningful consideration under the potential levee failure scenario.

The Phase 4b Project would be consistent with the American River Parkway Plan; however, should USACE require removal of waterside vegetation from the adjacent American River north levee, the Phase 4b Project would be potentially inconsistent with the Parkway Plan. (See Section 4.7, "Biological Resources," and Section 4.14, "Visual Resources," for the physical impacts that would result from vegetation removal, and the accompanying mitigation measures to help reduce these impacts.) This impact would remain significant and unavoidable.

Under the No-Action Alternative Potential Levee Failure scenario, potential impacts due to community disruption and displacement of residences and businesses are considered too speculative for meaningful consideration, given the uncertainties involved as a result of a levee failure.

The Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would temporarily disrupt established communities in the Phase 4b Project by restricting access to residences and businesses during construction. Even with mitigation, this impact would remain significant and unavoidable because no feasible mitigation measures are available to fully reduce this impact to a less-than-significant level. This impact would be greater for the Fix-in-Place Alternative because, under this alternative, sections of Garden Highway would be fully closed for extended periods of time. Similarly, there are no feasible mitigation measures available to fully reduce impacts related to community disruption as a result of removing residences and businesses to a less-than-significant level. This impact would therefore remain significant and unavoidable under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Because fewer residences and businesses would need to be removed, impacts under the Fix-in-Place Alternative would be slightly reduced compared to the Adjacent Levee Alternative (Proposed Action).

No residual impacts would remain concerning the displacement of residences and businesses under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.

4.4 GEOLOGY, SOILS, AND MINERAL RESOURCES

4.4.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.4.1.1 METHODOLOGY

This section addresses issues related to geologic hazards, specifically seismicity and soil erosion, soils, and mineral resources. Impacts associated with geology, soils, and mineral resources that could result from project-related activities were evaluated based on expected construction practices, materials used to construct the proposed improvements, general locations of improvements, and the nature of proposed operations.

This analysis relies on review of the *Soil Survey of Sutter County, California* (NRCS 1988), the *Soil Survey of Sacramento County* (NRCS 1993), *Mineral Land Classification: Portland Cement Concrete-Grade Aggregate and Kaolin Clay Resources in Sacramento County, California* (Dupras 1999), as well as published geologic maps and literature.

4.4.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) and alternatives under consideration were determined to result in a significant impact related to geology, soils, and mineral resources if they would do any of the following:

- expose people or structures to potential substantial adverse impacts, including risk of loss, injury, or death through the rupture of a known earthquake fault, strong seismic shaking, seismic-related ground failure, soil liquefaction, or landslides;
- result in substantial soil erosion or the loss of topsoil;
- locate project facilities on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed action, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- locate project facilities on expansive soil, creating substantial risks to property;
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- create a substantial flooding risk as a result of a seismic seiche;
- destroy a unique geologic feature;
- 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; or
- result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Because the project area is not located within an Alquist-Priolo Earthquake Fault Zone, fault ground rupture is highly unlikely and, therefore, this issue is not addressed further in this EIS/EIR.

All levee and canal improvements and borrow site excavation and reclamation would be designed based on the results of detailed geotechnical engineering studies performed previously (summarized in Kleinfelder 2008) and would be required to comply with standard engineering practices for levee design. The Central Valley Flood Protection Board's (CVFPB's) standards are the primary state standards applicable to the proposed levee improvements; these are stated in Title 23, Division 1, Article 8, Sections 111–137 of the California Code of Regulations. CVFPB's standards direct that levee design and construction be in accordance with USACE's *Engineering Design and Construction of Levees* (USACE 2000), the primary Federal standards applicable to levee improvements. Because the design, construction, and maintenance of levee improvements must comply with the regulatory standards of USACE and CVFPB, it is assumed that the design and construction of all levee modifications under the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would meet or exceed applicable design standards for static and dynamic stability, seismic ground shaking, liquefaction, subsidence, and seepage.

Because the project area is relatively flat, there would be no adverse impacts related to landslides. Therefore, this issue is not addressed further in this EIS/EIR.

Because the project would not involve the use of wastewater disposal systems of any kind, there would be no impact related to the ability of project area soils to support the use of septic systems. Therefore, this issue is not addressed further in this EIS/EIR.

While a seiche in the project area could be damaging, the risk of seiches is low, given the distance from active faults and the anticipated short duration of any seismic ground shaking in the area. Therefore, this issue is not addressed further in this EIS/EIR.

There are no unique geologic features in the project area. Therefore, the project would not destroy such features, and this issue is not discussed further in this EIS/EIR.

4.4.2 Impacts and Mitigation Measures

Impact 4.4-a: Potential Temporary Localized Soil Erosion during Construction

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for construction-related soil erosion. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of the flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Any levee failures would likely result in soil scouring and permanent loss of topsoil in localized areas within several hundred feet of a levee breach. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Therefore, a precise determination of significance is not possible and cannot be made. This impact could be offset by soil deposition resulting from inundation of the Natomas Basin by sediment-laden flood waters. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Phase 4b Project would include a substantial amount of construction activity along the Sacramento River east levee Reach A:16–20, the American River north levee Reach I:1–4, the northern portion of the NEMDC west levee from just south of Elkhorn Boulevard to Sankey Road, the PGCC west levee, the NCC south levee, at the Brookfield borrow site (conversion to managed marsh), at the Chappell Ditch and Drain, at the West Drainage Canal, at the proposed new borrow sites listed in **Table 2-23**, at bank protection sites in the NEMDC and PGCC, and at pumping plants throughout the Phase 4b Project area. Construction activities would be conducted continuously, to the extent feasible, between April and November.

Borrow activity is subject to regulation under SMARA, which is administered by the county in which the borrow site is located (i.e., Sacramento and Sutter Counties) (see "California Surface Mining and Reclamation Act" under Section 3.4.1, "Regulatory Setting"). Soil excavation from borrow sites would involve preserving and replacing topsoil on these parcels. Upon completion of soil excavation, the excavated parcels would be reclaimed as agricultural land, natural habitat, or detention basins (see **Table 2-23** for a list of the new borrow sites proposed as part of the Phase 4b Project, as well as their proposed post-reclamation use).

As part of the borrow operations, the upper 6–12 inches of topsoil from the borrow sites would be set aside and replaced on-site after project construction in each construction season. After the project is complete, the borrow sites would be recontoured and reclaimed. These borrow operations would support levee construction involving soil stripping and site grading in the footprint of the adjacent levee and seepage berms along the Sacramento River east levee.

Structures and trees would need to be removed from a portion of the Phase 4b Project footprint of the adjacent levee and berms along the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, the west levee of NEMDC North, and the PGCC west levee. In addition, power poles adjacent to the Sacramento River east levee Reach A:16–20 and the American River north levee Reach I:1–4 would need to be removed and relocated. Both of these activities would temporarily disturb soil.

Borrow site excavation; conversion of the Brookfield borrow site to managed marsh; and improvements to levees, canals, and pumping plants would result in the temporary disturbance of soil, and could expose disturbed areas to erosion due to wind or early-season rainfall events. Wind or rainfall of sufficient intensity could dislodge soil particles from the soil surface. Once particles are dislodged, substantial localized erosion could occur. The potential for substantial erosion or loss of topsoil during construction of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative is considered a **potentially significant** impact. ***(Similar)***

Mitigation Measure 4.4-a(1): Implement Mitigation Measure 4.6-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement Mitigation Measure 4.6-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions," set forth in full in Section 4.6, "Water Quality." The final design and construction specifications for all project components, including borrow sites, shall include implementation of standard erosion, siltation, and soil stabilization Best Management Practices (BMPs). In summary, this mitigation measure requires filing a Notice of Intent (NOI) with the Central Valley Regional Water Quality Control Board (RWQCB); implementing standard erosion, siltation, and BMP measures; preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP); and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities

Implementing this mitigation measure would reduce the impacts related to erosion from construction activities to a **less-than-significant** level because a SWPPP and BMPs to prevent erosion and siltation would be implemented. ***(Similar)***

Mitigation Measure 4.4-a(2): Secure and Implement the Conditions of the California Surface Mining and Reclamation Act Permit or Exemption

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	In the event that any activity is defined as surface mining (under PRC Section 2735, 14 California Code of Regulations Section 3501) and determined to be subject to SMARA (PRC Section 2714), the project proponent(s) shall either seek an exemption or secure, and implement the conditions contained in the SMARA permit as administered and issued by the local agency (applicable county).

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities

Implementing this mitigation measure would reduce the impacts related to erosion from construction activities on borrow sites to a **less-than-significant** level because the project proponent(s) would secure a SMARA permit (if required) and implement its conditions, or would seek an exemption, if applicable. ***(Similar)***

Impact 4.4-b: Potential Soil Erosion During Project Operations

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project activities would occur and levee operations would remain the same as existing conditions. Soil erosion is an existing threat to the structural integrity of the Natomas perimeter levee system due to seepage issues and riverbank erosion. If left unrepaired, erosion sites may become larger, increasing the chances of levee failure. In addition, because there is currently inadequate levee height within the Phase 4b Project footprint, the risk of levee overtopping during a flood event remains high. Levee overtopping would likely result in soil erosion and the loss of topsoil in localized areas within several hundred feet of a levee breach. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Because implementation of the No-Action Alternative would result in continued soil erosion, this impact is considered **potentially significant**. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of the flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Potential levee failure could result from further deterioration of existing erosion sites, levee overtopping, or seepage issues, as described above under "No Phase 4b Project Construction." Levee failure could result in soil scouring and permanent loss of topsoil in localized areas within several hundred feet of a levee breach. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. While a precise determination of significance is not possible, soil erosion within the Phase 4b Project footprint is an existing condition and is expected to continue. This impact would be **potentially significant** for the same reasons as described above. ***(Greater)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would address inadequate levee height, through-seepage and underseepage, and riverbank erosion—issues that are directly related to soil erosion and/or the loss of topsoil (see Chapter 2, "Alternatives," for detailed information). Overtopping and wind wave action could cause substantial soil erosion and the loss of topsoil within the Natomas Basin.

Additional levee height is required along the NCC south levee and Reaches C:1–4B and B:5A–11 of the Sacramento River east levee to meet the minimum requirements established by FEMA as part of the Natomas Flood Insurance Program or the minimum requirements established by the State. As part of these requirements, 3 feet of levee height would be constructed to reduce the potential of overtopping and erosion from wind-induced waves. Implementation of the Phase 4b Project would bring the levees surrounding the Natomas Basin into compliance with applicable standards and requirements, and substantially reduce the potential for substantial soil erosion and/or the loss of topsoil during elevated water events.

As described in Section 1.4.2.1, "Flood Problems and Needs," seepage beneath and through segments of the Natomas levee system has been identified as a substantial risk to the stability and reliability of the system. Seepage is characterized as either underseepage or through-seepage, both of which result in soil erosion. Underseepage problems occur in locations where levees are constructed on low-permeability foundation soil (silt and clay) underlain by higher-permeability layers (sand and gravel). Under these conditions, seepage travels horizontally under the levee and then is forced vertically upward through the low-permeability foundation layer, often referred to as the "blanket." Failure of the blanket can occur either by uplift, a condition in which the blanket does not have enough weight to resist the confined pressure acting upon the bottom of the blanket, or by piping (internal erosion) caused by water flowing under high vertical gradients through the erodible blanket and carrying fine soil particles out of the foundation materials. Soil erosion can also occur as through-seepage, which is seepage through a levee embankment that can occur during periods of high river stage. When through-seepage occurs, soil erosion on the landside of the levee may result. Implementation of the Phase 4b Project would address seepage issues along the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, and NEMDC west levee (Reaches F–G). With these improvements, the potential for through-seepage and underseepage, thus potential for soil erosion, would be substantially reduced.

Riverbank erosion, caused by bed or toe scour and wave wash, is a current problem within the Phase 4b Project footprint. Implementation of the Phase 4b Project would include construction of bank protection structures along the west levee of NEMDC South (Reach H) and the PGCC (Reach E). Riverbank erosion sites are located within the Phase 4b Project footprint; however, these erosion sites are not anticipated to intrude into the projected levee slope of the new adjacent levee. Thus, project elements of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would decrease riverbank erosion issues existing within the Natomas Basin levee system.

As discussed above, implementation of the Phase 4b Project would bring the levees surrounding the Natomas Basin into compliance with applicable standards and requirements. These standards and requirements include repairs that would address inadequate levee height, seepage, and riverbank erosion, and thus the potential for soil erosion and the loss of topsoil. This impact would be **beneficial** and, therefore, **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.4-c: Potential Loss of Mineral Resources

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for loss of mineral resources. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of the flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Within those areas of the Natomas Basin that are zoned MRZ-1, where no mineral resources are present, there would be no impact as a result of a flood event. For those areas that are zoned MRZ-3, where it is unknown whether mineral resources exist, a precise determination of significance is not possible. Because of this uncertainty, this potential impact to areas of the Natomas Basin that are zoned MRZ-3 is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Phase 4b Project would include excavation of soil from the West Lakeside borrow site, which contains a small area zoned MRZ-3 by the California Department of Conservation (DOC), Division of Mines and Geology. As discussed in Section 3.4, "Geology, Soils, and Mineral Resources," the MRZ-3 designation indicates that the significance of mineral deposits in that area cannot be evaluated from existing data. Excavation of borrow materials from the West Lakeside borrow site would not be expected to exceed a depth of 2 feet. Because the depth at which an economically viable source of aggregate is unknown in areas designated MRZ-3, mineral deposits could be encountered during borrow activities within the West Lakeside borrow site.

Borrow materials needed for project implementation, however, would be limited to earthen materials (i.e., soils) and would not consist of sediments that would be considered aggregate resources. As described in Section 2.3.3.8, "Environmental Commitments for Borrow Sites," suitable borrow material would be classified as soil based upon geotechnical data obtained before the start of borrow activities and the Phase 4b Project would not excavate material considered to be construction aggregate. Thus, economically valuable minerals, if present in the West Lakeside borrow site, would not be considered suitable material, and would be avoided. Therefore, this impact would be **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

4.4.3 RESIDUAL SIGNIFICANT IMPACTS

In the event of levee failure under the No-Action Alternative, the magnitude of impacts due to temporary soil erosion from construction and potential loss of mineral resources is uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be fully mitigated.

Without construction of the Phase 4b Project, soil erosion within the project area would continue and could be exacerbated by factors such as wind and wave runoff and severe storms. Implementation of the Phase 4b Project would reduce soil erosion associated with levee operation.

Implementation of Mitigation Measures 4.4-a(1) and 4.4-a(2) would reduce to less-than-significant levels the temporary potentially significant impacts associated with soil erosion due to construction activities under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.

4.5 HYDROLOGY AND HYDRAULICS

4.5.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.5.1.1 METHODOLOGY

This section addresses flood management as a defining element of the physical environment in the project area and evaluates the potential hydraulic impacts of the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration on the operations of the Sacramento River Flood Control Project (SRFCP) and interior drainage within the Natomas Basin. It also evaluates the potential impact of proposed cutoff walls on existing groundwater wells.

Technical Planning Studies

This analysis relies on information provided by various public agencies, as well as the following site-specific technical planning studies generated to support the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration in this EIS/EIR:

- *Sacramento Area Flood Control Agency, Natomas Levee Improvement Program, Summary Report on Hydraulic Impact Analyses, Phase 4b Project,* MBK Engineers 2010 (**Appendix C1**);
- *Shaded Riverine Aquatic Habitat Mitigation Memo for SAFCA NLIP Phase 2 and 3 Projects*, AECOM 2009 (**Appendix C1**);
- *Evaluation of Potential Groundwater Impacts Due to Proposed Construction for Natomas Levee Improvement Program,* Luhdorff & Scalmanini Consulting Engineers 2009 (**Appendix C2**);
- *Evaluation of Cutoff Walls Impacts on Groundwater Recharge, Sacramento East Levee, Natomas Levee Improvement Program*, Kleinfelder 2007, revised 2009 (**Appendix C3**);
- *Potential Impacts of Slurry Cutoff Walls Proposed for Phase 4B of the Natomas Levee Improvement Program*, Luhdorff & Scalmanini Consulting Engineers 2010 (**Appendix C4**);
- *Natomas East Main Drainage Canal Erosion Protection Design,* Northwest Hydrologic Consultants 2009 (**Appendix C5**); and
- *Draft Pleasant Grove Creek Canal Erosion Analysis,* Northwest Hydrologic Consultants 2008 (**Appendix C5**).

These reports have been updated to include datum conversion from National Geodetic Vertical Datum of 1929 (NGVD29) to North American Vertical Datum of 1988 (NAVD88) in accordance with USACE's requirement that all vertical datum for USACE inland levee projects and Federal levees within USACE's Inspection of Completed Works be in NAVD88.

Hydraulic Modeling

The surface hydrology analysis evaluates the potential flood-related impacts of the action alternatives on water surface elevations in the stream and river channels in the project area and in the larger watershed within which the project is situated. Specifically, a UNET hydraulic computer model was used to compare existing conditions in the waterways surrounding the Natomas Basin and in the larger SRFCP both with and without the Adjacent Levee Alternative (Proposed Action) (with-project and without-project [i.e., No-Action Alternative], respectively) assuming no levee failure and other reasonably foreseeable improvements to Folsom Dam and the urban levees

outside the Natomas Basin. A sensitivity analysis was also performed to show impacts assuming that levees would fail if water reaches the top of the levee. These analyses were conducted by MBK Engineers and are contained in a summary report in **Appendix C1**.

The existing conditions analysis provided in **Tables 4.5-3** through **4.5-8** is based on an evaluation of the levee and reservoir system as it existed in December 2009. The No-Action (without-project) condition assumed implementation of Federally authorized improvements to Folsom Dam and anticipated "early implementation" improvements to the levees protecting existing urban areas outside the Natomas Basin (i.e., American River Basin, West Sacramento, Yuba Basin, and Sutter Basin) so as to provide these areas with 200-year flood risk reduction (0.005 annual exceedance probability [AEP]). The with-project condition added the improvements proposed as part of the entire NLIP, including the Phase 4b Project, to the No-Action condition to display the individual and cumulative impacts of the Adjacent Levee Alternative (Proposed Action) when added to the other reasonably foreseeable urban levee improvement projects in the Sacramento Valley. The NLIP includes additional levee raising already evaluated in the Phase 2 EIR, Phase 2 EIS, Phase 3 EIS and EIR, and Phase 4a EIS and EIR. The Phase 4b Project (both action alternatives) include levee raising above the 0.005 AEP water surface profile along the NEMDC and PGCC (**Plates 2-11** and **2-13**).

In addition to levee raising, the Phase 4b Project is designed to address several waterside erosion sites and to reduce damage to the levee from burrowing animals through construction of bank protection features along the PGCC and NEMDC South at the locations shown on **Plates 2-13** and **2-14**. The details of the proposed erosion repairs on the NEMDC and the details of the analysis of erosion potential on the PGCC are included in **Appendix C5**. Erosion repair and rock slope protection would be constructed at locations where erosion around the outfall structures has been observed. Construction of bank protection features would increase channel roughness and may contribute to a minor amount of channel constriction from the addition of rock protection. Erosion repair and rock bank protection on the PGCC and NEMDC, and low-flow channel realignment in the NEMDC at I-80, were addressed in the UNET hydraulic computer model. In addition, the model assumed creation of shaded riverine aquatic (SRA) habitat mitigation on the Sacramento River (Reach C1), which was in the Phase 3 FEIS. The NEMDC erosion repair sites, which would include rock berms along the low-flow channel, were modeled by modifying the affected cross-sections in the model to reflect these improvements. SRA habitat mitigation along the Sacramento River east levee Reach C:1 (**Appendix C1**), which consists of increased bank vegetation, was modeled by increasing the bank's roughness coefficient. PGCC erosion repair was not included in the hydraulic model because it is in an area that is controlled by backwater from the Sacramento River during large flood events and therefore would not affect peak flood stages on the PGCC. Likewise, low-flow channel realignment was not included in the hydraulic model because it would not change the cross-sectional areas of the NEMDC and therefore would not affect the hydraulic capacity of the NEMDC.

The analysis consisted of calibrating the hydraulic model to historic flood events using high-water marks and stream gauge data gathered in connection with the 1997 flood, and modeling the existing Adjacent Levee Alternative (Proposed Action) and No-Action conditions under the following flood scenarios: (1) the 1957 water surface profiles that serve as the minimum design standard for the SRFCP; (2) the 0.01 AEP (100-year) design flood elevation that affects management of SRFCP-protected floodplains under the National Flood Insurance Program (33 CFR Section 65.10); (3) the 0.005 AEP (200-year) design flood elevation that is likely to affect implementation of the floodplain management standards recently adopted by the California Legislature (Chapter 364, Statutes of 2008 [adding Water Code Section 9602(i)]); and (4) the 0.002 AEP (500-year) design flood elevation that represents an extreme flood event and is the largest flood event for which hydrologic input data have been developed for the hydraulic simulation model. Each of these scenarios was modeled assuming that levees outside the project area would not fail when overtopped. However, for comparison purposes, an additional sensitivity analysis was conducted to estimate impacts with the assumption that levee failures would occur if water reaches the top of levee.

4.5.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to hydrology and hydraulics if they would do any of the following:

- 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;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- place housing within a 100-year flood hazard area (0.01 AEP) or place within a 100-year flood hazard area (0.01 AEP) structures that would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury, or death involving flooding; or
- substantially alter the existing drainage pattern of a site or an area, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site.

In determining whether a project would expose people or structures to a significant risk as a result of flooding, the project proponent(s) use the following thresholds:

- whether the project would cause encroachment on SRFCP design levee height for the SRFCP design flow for a project levee outside the project area, or
- whether the project would cause a significant increase in flooding in an area that is outside the protection of the SRFCP.

For purposes of these thresholds, "flood hazard area" means an area that does not meet the minimum level of flood protection required by Federal or state law, whichever is more stringent. The 0.01 AEP (100-year flood risk reduction) will be the standard applicable until 2015, or perhaps earlier, depending on when the Central Valley Flood Protection Plan takes effect. At that point, the applicable standard would be governed by Senate Bill 5, namely, either 0.005 AEP protection (200-year flood risk reduction) or "adequate progress" towards meeting this standard by 2025.

4.5.2 IMPACTS AND MITIGATION MEASURES

Impact 4.5-a: Hydraulic Impacts on Other Areas and Exposure to Flood Risk

Table 4.5-1 summarizes the conditions and assumptions associated with each of the UNET model runs. Modeling was conducted under existing conditions, future conditions without the Phase 4b Project, and future conditions with construction of the Phase 4b Project. **Table 4.5-2** shows the number of levee failures predicted by the model under these conditions for three design floods: 0.01 AEP (100-year), 0.005 AEP (200-year), and 0.002 AEP (500-year). **Tables 4.5-3** through **4.5-8** show the modeling outputs (predicted water surface elevations) generated by conditions expected under the target flood scenarios analyzed.

Table 4.5-1
Definition of Hydraulic Model Assumptions for Various Conditions

Condition	Top of Levee Assumption	Levee Failure Assumption	Reservoir Operations Assumption
Existing	Existing top of levee grade December 2009 (including California Levee Database information)	Levees overtop without failing	Existing reservoirs and current (2009) operation criteria
Without-project	Same as the Existing Condition with the following changes: Federally authorized improvements to Folsom Dam are implemented and urban area levees outside the Natomas Basin are assumed to have levees at 200-year (0.005 AEP) water surface +3 feet of levee height; NLIP levees same as the existing condition	Levees overtop without failing	Same as the existing condition except Folsom Dam would be operated in accordance with the Joint Federal Project currently under construction
With-project [1]	Same as the without-project condition except NLIP levees raised to design level	Levees overtop without failing	Same as the without-project condition
Existing Sensitivity Analysis	Same as the existing condition	Levees fail when water reaches top of levee	Same as the existing condition
Without-project Sensitivity Analysis	Same as the without-project condition except that SRFCP levees with top elevations below SRFCP design standard are assumed to be raised to meet this standard	Levees fail when water reaches the top of the levee	Same as the without-project condition
With-project Sensitivity Analysis	Same as the with-project condition except that SRFCP levees with top elevations below SRFCP design standard are assumed to be raised to meet this standard	Levees fail when water reaches the top of the levee	Same as the without-project condition

Notes: AEP = Annual Exceedance Probability; NLIP = Natomas Levee Improvement Program; SRFCP = Sacramento River Flood Control Project

[1] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition, including levee raises on the Sacramento River, NCC, PGCC and NEMDC in the locations shown in Figure 3 of **Appendix C1**. Levee raises as part of the Phase 4b Project would be located on the PGCC and NEMDC (**Plates 2-11** and **2-13** in this EIS/EIR).

Source: **Appendix C1**

Table 4.5-2
Extent of Levee Overtopping, Without-Project Conditions
(Levees Overtop Without Failing, All Values Approximate)

River	Leveed Length (miles)	Approximate Length of Overtopped Levee (miles)					
		Left Bank[1]			Right Bank[1]		
		0.01 AEP (100-Year)	0.005 AEP (200-Year)	0.002 AEP (500-Year)	0.01 AEP (100-Year)	0.005 AEP (200-Year)	0.002 AEP (500-Year)
American River	13	0	0	5.1	0	0	7.8
Feather River	50	0	0	5.9	0	0	7.5
Natomas Cross Canal	5	0	2.0	3.3	0.1	2.0	2.3
Sacramento Bypass	1.7	0	0	0	0	0	0.2
Sacramento River upstream of Natomas Cross Canal	90	0	1.0	5.1	0.5	1.6	3.6
Sacramento River adjacent to Natomas	18	0	<0.1	2.3	0	2.6	3.5
Sacramento River downstream of American River	60	0	0.2	0.5	0	0	0.9
Sutter Bypass	30	0	1.4	2.0	0	2.4	3.9
Tisdale Bypass	4	0	0	1.4	0	0	2.0
Wadsworth Bypass	4	0	0	0	1.6	1.9	2.9
Yolo Bypass	37	0	0.3	2.3	0	0	0

Notes: AEP = Annual Exceedance Probability

[1] Left and right bank reference based on downstream-facing orientation.

Source: **Appendix C1**

Table 4.5-3
0.01 AEP (100-Year) Maximum Water Surface Elevation Summary
(No Levee Failures)

Location (USACE Comprehensive Study River Mile)	Maximum Water Surface Elevation (Feet NAVD88[1])			Change (Feet)	
	Existing	Without-project	With-project[2]	Existing to without-project	Without-project to with-project
Sacramento River					
at Knight's Landing (90.22)	44.55	44.53	44.53	-0.02	0
at Fremont Weir, west end (84.75)	42.60	42.56	42.56	-0.04	0
at Natomas Cross Canal (79.21)	43.44	43.38	43.39	-0.06	+0.01
at I-5 (71.00)	39.18	38.94	38.92	-0.24	-0.02
at Sacramento Bypass (63.82)	34.27	33.69	33.69	-0.58	0
at NEMDC (61.0)	34.81	34.25	34.24	-0.56	-0.01
at I Street (59.695)	34.54	33.97	33.96	-0.57	-0.01
at Freeport Bridge (46.432)	28.19	27.78	27.78	-0.41	0
Natomas Cross Canal					
at SR 99/70 (4.82)	43.50	43.44	43.45	-0.06	+0.01
Pleasant Grove Creek Canal					
at Sankey Road (3.65)	43.36	43.30	43.30	-0.06	0
at Fifield Road (1.49)	43.50	43.44	43.44	-0.06	0
at Howsley Road (0.40)	43.51	43.45	43.45	-0.06	0
Natomas East Main Drainage Canal					
at Elverta Road (10.35)	34.26	34.26	34.26	0	0
at Elkhorn Boulevard (8.35)	33.47	33.48	33.48	+0.01	0
at Main Avenue (6.09)	39.71	39.69	39.69	-0.02	0
at West El Camino Avenue (2.96)	36.85	36.18	36.18	-0.67	0
Feather River					
at Nicolaus Gage (8.00)	50.98	50.97	50.97	-0.01	0
Yolo Bypass					
at Woodland Gage (51.10)	35.59	35.48	35.48	-0.11	0
American River					
at H Street (6.471)	45.40	43.11	43.11	-2.29	0

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

[1] Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).

[2] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: **Appendix C1**

Table 4.5-4
0.005 AEP (200-Year) Maximum Water Surface Elevation Summary
(No Levee Failures)

Location (USACE Comprehensive Study River Mile)	Maximum Water Surface Elevation (Feet NAVD88[1])			Change (Feet)	
	Existing	Without-project	With-project[2]	Existing to without-project	Without-project to with-project
Sacramento River					
at Knight's Landing (90.22)	45.20	45.20	45.20	0	0
at Fremont Weir, west end (84.75)	44.04	44.02	44.03	-0.02	+0.01
at Natomas Cross Canal (79.21)	44.91	44.89	44.92	-0.02	+0.03
at I-5 (71.00)	40.66	40.35	40.35	-0.31	0
at Sacramento Bypass (63.82)	37.19	35.76	35.76	-1.43	0
at NEMDC (61.0)	37.97	36.34	36.34	-1.63	0
at I Street (59.695)	37.68	36.05	36.05	-1.63	0
at Freeport Bridge (46.432)	30.76	29.64	29.64	-1.12	0
Natomas Cross Canal					
at SR 99/70 (4.82)	44.94	44.92	44.95	-0.02	+0.03
Pleasant Grove Creek Canal					
at Sankey Road (3.65)	44.69	44.68	44.70	-0.01	+0.02
at Fifield Road (1.49)	44.89	44.88	44.90	-0.01	+0.02
at Howsley Road (0.40)	44.93	44.91	44.94	-0.02	+0.03
Natomas East Main Drainage Canal					
at Elverta Road (10.35)	38.25	38.23	38.33	-0.02	+0.10
at Elkhorn Boulevard (8.35)	38.11	38.09	38.19	-0.02	+0.10
at Main Avenue (6.09)	44.18	41.05	41.05	-3.13	0
at West El Camino Avenue (2.96)	42.28	38.44	38.44	-3.84	0
Feather River					
at Nicolaus Gage (8.00)	53.32	53.32	53.32	0	0
Yolo Bypass					
at Woodland Gage (51.10)	36.93	36.87	36.88	-0.06	+0.01
American River					
at H Street (6.471)	49.61	46.72	46.72	-2.89	0

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

[1] Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).

[2] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: **Appendix C1**

Table 4.5-5
0.002 AEP (500-Year) Maximum Water Surface Elevation Summary
(No Levee Failures)

Location (USACE Comprehensive Study River Mile)	Maximum Water Surface Elevation (Feet NAVD88[1])			Change (Feet)	
	Existing	Without-project	With-project[2]	Existing to without-project	Without-project to with-project
Sacramento River					
at Knight's Landing (90.22)	45.49	45.51	45.52	+0.02	+0.01
at Fremont Weir, west end (84.75)	44.91	44.95	44.99	+0.04	+0.04
at Natomas Cross Canal (79.21)	45.57	45.59	45.77	+0.02	+0.18
at I-5 (71.00)	41.54	41.55	41.61	+0.01	+0.06
at Sacramento Bypass (63.82)	38.66	38.71	38.72	+0.05	+0.01
at NEMDC (61.0)	39.57	39.68	39.68	+0.11	0
at I Street (59.695)	39.24	39.38	39.38	+0.14	0
at Freeport Bridge (46.432)	31.74	31.91	31.91	+0.17	0
Natomas Cross Canal					
at SR 99/70 (4.82)	45.54	45.55	45.76	+0.01	+0.21
Pleasant Grove Creek Canal					
at Sankey Road (3.65)	45.35	45.35	45.48	0	+0.13
at Fifield Road (1.49)	45.59	45.60	45.75	+0.01	+0.15
at Howsley Road (0.40)	45.60	45.61	45.79	+0.01	+0.18
Natomas East Main Drainage Canal					
at Elverta Road (10.35)	41.90	41.90	42.23	0	+0.33
at Elkhorn Boulevard (8.35)	41.75	41.75	42.10	0	+0.35
at Main Avenue (6.09)	47.03	47.09	47.09	+0.06	0
at West El Camino Avenue (2.96)	45.32	45.41	45.41	+0.09	0
Feather River					
at Nicolaus Gage (8.00)	55.79	55.93	55.94	+0.14	+0.01
Yolo Bypass					
at Woodland Gage (51.10)	38.03	38.08	38.21	+0.05	+0.13
American River					
at H Street (6.471)	50.54	50.61	50.61	+0.07	0

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

[1] Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).

[2] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: **Appendix C1**

Table 4.5-6
0.01 AEP (100-Year) Maximum Water Surface Elevation Summary
(Levees Fail When Water Reaches Top of Levee—Sensitivity Analysis)

Location (USACE Comprehensive Study River Mile)	Maximum Water Surface Elevation (Feet NAVD88[1])			Change (Feet)	
	Existing	Without-project	With-project[2]	Existing to without-project	Without-project to with-project
Sacramento River					
at Knight's Landing (90.22)	43.95	43.95	43.95	0	0
at Fremont Weir, west end (84.75)	42.22	42.19	42.19	-0.03	0
at Natomas Cross Canal (79.21)	42.87	42.82	42.82	-0.05	0
at I-5 (71.00)	38.74	38.50	38.48	-0.24	-0.02
at Sacramento Bypass (63.82)	34.04	33.43	33.42	-0.61	-0.01
at NEMDC (61.0)	34.55	33.96	33.96	-0.59	0
at I Street (59.695)	34.28	33.69	33.68	-0.59	-0.01
at Freeport Bridge (46.432)	28.00	27.51	27.50	-0.49	-0.01
Natomas Cross Canal					
at SR 99/70 (4.82)	42.94	42.94	42.95	0	+0.01
Pleasant Grove Creek Canal					
at Sankey Road (3.65)	42.80	42.82	42.83	+0.02	+0.01
at Fifield Road (1.49)	42.91	42.92	42.93	+0.01	+0.01
at Howsley Road (0.40)	42.91	42.93	42.93	+0.02	0
Natomas East Main Drainage Canal					
at Elverta Road (I0.35)	34.26	34.34	34.35	+0.08	+0.01
at Elkhorn Boulevard (8.35)	33.47	33.49	33.49	+0.02	0
at Main Avenue (6.09)	39.70	39.74	39.74	+0.04	0
at West El Camino Avenue (2.96)	36.81	36.16	36.15	-0.65	-0.01
Feather River					
at Nicolaus Gage (8.00)	50.87	50.86	50.86	-0.01	0
Yolo Bypass					
at Woodland Gage (51.10)	35.22	35.13	35.13	-0.09	0
American River					
at H Street (6.471)	45.39	43.08	43.08	-2.31	0

Notes: I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

[1] Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29).Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).

[2] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: **Appendix C1**

Table 4.5-7
0.005 AEP (200-Year) Maximum Water Surface Elevation Summary
(Levees Fail When Water Reaches Top of Levee—Sensitivity Analysis)

Location (USACE Comprehensive Study River Mile)	Maximum Water Surface Elevation (Feet NAVD88[1])			Change (Feet)	
	Existing	Without-project	With-project[2]	Existing to without-project	Without-project to with-project
Sacramento River					
at Knight's Landing (90.22)	43.96	43.96	43.96	0	0
at Fremont Weir, west end (84.75)	42.80	42.82	42.82	+0.02	0
at Natomas Cross Canal (79.21)	43.29	43.28	43.30	-0.01	+0.02
at I-5 (71.00)	39.58	39.30	39.30	-0.28	0
at Sacramento Bypass (63.82)	36.39	35.10	35.10	-1.29	0
at NEMDC (61.0)	37.13	35.66	35.66	-1.47	0
at I Street (59.695)	36.84	35.38	35.38	-1.46	0
at Freeport Bridge (46.432)	30.02	28.88	28.89	-1.14	+0.01
Natomas Cross Canal					
at SR 99/70 (4.82)	43.42	43.45	43.47	+0.03	+0.02
Pleasant Grove Creek Canal					
at Sankey Road (3.65)	43.43	43.48	43.51	+0.05	+0.03
at Fifield Road (1.49)	43.52	43.57	43.60	+0.05	+0.03
at Howsley Road (0.40)	43.49	43.53	43.56	+0.04	+0.03
Natomas East Main Drainage Canal					
at Elverta Road (10.35)	34.66	34.66	34.66	0	0
at Elkhorn Boulevard (8.35)	33.78	33.78	33.78	0	0
at Main Avenue (6.09)	43.70	41.03	41.03	-2.67	0
at West El Camino Avenue (2.96)	42.28	38.31	38.30	-3.97	-0.01
Feather River					
at Nicolaus Gage (8.00)	52.42	52.48	52.48	+0.06	0
Yolo Bypass					
at Woodland Gage (51.10)	35.91	35.85	35.86	-0.06	+0.01
American River					
at H Street (6.471)	49.28	46.62	46.62	-2.66	0

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

[1] Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).

[2] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: **Appendix C1**

Table 4.5-8
0.002 AEP (500-Year) Maximum Water Surface Elevation Summary
(Levees Fail When Water Reaches Top of Levee—Sensitivity Analysis)

Location (USACE Comprehensive Study River Mile)	Maximum Water Surface Elevation (Feet NAVD88[1])			Change (Feet)	
	Existing	Without-project	With-project[2]	Existing to without-project	Without-project to with-project
Sacramento River					
at Knight's Landing (90.22)	44.10	44.11	44.12	+0.01	+0.01
at Fremont Weir, west end (84.75)	43.62	43.64	43.64	+0.02	0
at Natomas Cross Canal (79.21)	44.21	44.24	44.24	+0.03	0
at I-5 (71.00)	39.92	39.45	39.47	-0.47	+0.02
at Sacramento Bypass (63.82)	37.10	36.71	36.70	-0.39	-0.01
at NEMDC (61.0)	37.93	37.40	37.38	-0.53	-0.02
at I Street (59.695)	37.62	37.10	37.08	-0.52	-0.02
at Freeport Bridge (46.432)	30.49	30.16	30.15	-0.33	-0.01
Natomas Cross Canal					
at SR 99/70 (4.82)	44.42	44.43	44.44	+0.01	+0.01
Pleasant Grove Creek Canal					
at Sankey Road (3.65)	44.45	44.45	44.46	0	+0.01
at Fifield Road (1.49)	44.59	44.59	44.60	0	+0.01
at Howsley Road (0.40)	44.57	44.57	44.58	0	+0.01
Natomas East Main Drainage Canal					
at Elverta Road (10.35)	34.46	36.72	37.04	+0.26	+0.32
at Elkhorn Boulevard (8.35)	35.97	36.35	36.75	+0.38	+0.40
at Main Avenue (6.09)	45.62	45.28	45.28	-0.34	0
at West El Camino Avenue (2.96)	43.49	43.25	43.25	-0.24	0
Feather River					
at Nicolaus Gage (8.00)	54.27	54.27	54.27	0	0
Yolo Bypass					
at Woodland Gage (51.10)	36.57	36.62	36.62	+0.05	0
American River					
at H Street (6.471)	49.39	50.11	50.11	+0.72	0

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

[1] Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).

[2] With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: **Appendix C1**

The 0.002 AEP (500-year), no levee failure flood scenario represents the worst-case scenario for the Sacramento River and the NCC under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Under the much more likely assumption that upstream levees would fail when water reaches the top of the levee, the water surface elevations around the Natomas Basin would be the same or dramatically lower than the 200-year (0.005 AEP) (no levee failure) and 500-year (0.002 AEP) (no levee failure) water surface elevations that were

used for the design of the NLIP, with the one exception of a predicted 0.05-foot water surface elevation increase on the NEMDC at Elkhorn Boulevard during a 500-year (0.002 AEP) profile. The 500-year (0.002 AEP) (with levee failures) water surface elevations predicted in the Sacramento River channel under the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative are essentially the same as the 200-year (0.002 AEP) (no levee failure) water surface elevations predicted in the Sacramento River channel without the project (No-Action Alternative).

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction or operational activities would occur; therefore, hydrology or hydraulics within water bodies within the project area would not be altered. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Wind and wave run-up or seepage conditions could cause portions of this system to fail, triggering widespread flooding and extensive damage to property within the Basin. Residences on the waterside of the Sacramento River levee in the vicinity of a levee breach could be engulfed, access to residences on the waterside of the levee and within the Basin could be cut off, and interior roadways and other infrastructure damaged. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. While a precise determination of significance is uncertain, due to the uncontrolled consequences of levee failure, this impact is still assumed to be **significant** because nearly any type of levee failure in the Natomas Basin would have a high potential for substantial effects on channel hydrology, hydraulics, and flooding. As discussed in Section 4.1, "Approach to the Environmental Analysis," no mitigation is required. This impact would remain **significant and unavoidable**. ***(Greater)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, levee raises would occur on the west levees of the PGCC and NEMDC (**Plates 2-11**, **2-13**, and **2-14**) to provide the required 3 feet of levee height above the 0.005 AEP (200-year) design water surface profile. This levee height requirement originates in National Flood Insurance Program regulations and the engineering practice of the California Department of Water Resources, and this requirement has been established by FEMA to develop design standards for providing a 0.005 AEP (200-year) level of flood damage reduction for urban areas protected by levees in the Central Valley. Analysis of hydraulic impacts of these levee raises is cumulative and includes the levee raises on the Sacramento River east levee and NCC south levee that were analyzed as part of the Phase 2, Phase 3, and Phase 4a Projects.

Tables 4.5-3 through **4.5-5** show the change in water surface elevations from "without-project to with-project" that would result from construction of the Phase 4b Project in the 0.01 AEP (100-year), 0.005 AEP (200-year), and 0.002 AEP (500-year) model runs. In the 0.01 AEP (100-year) and 0.005 AEP (200-year) model simulations, most locations in the waterways around the Natomas Basin would see little or no change in maximum water surface elevations, with most increases ranging from 0.01 feet to 0.03 feet (less than one-half inch). In the 0.005 AEP (200-year) event, the results show a slight increase (0.1 feet or slightly over one inch) in the NEMDC at Elverta Road and Elkhorn Boulevard. In this section of the NEMDC, there is no east levee, and flood waters back up into a largely undeveloped area between the NEMDC and a railroad berm. This change in water surface elevation would be too small to affect the few structures located on high ground in this area. It should be noted

that changes in water surface elevations of 0.1 feet are not detectable in typical conditions of major flood events, where waves of several feet can be generated by wind or turbulence caused by currents.

In the 0.002 AEP (500-year) event (**Table 4.5-5**), predicted water surface elevation increases would range up to 0.18 feet along the Natomas reach of the Sacramento River, up to 0.21 feet in the NCC, up to 0.18 feet in the PGCC, and up to 0.35 feet in the NEMDC. However, this event, with the assumption of no levee failures in non-urban areas, is extremely unlikely, given that the predicted number of levee failures in the system for the 500-year event (with-project) would be 133 (**Table 4.5-2**). With the reasonable and more defensible assumption that levees fail when water reaches to the levee top, predicted changes in water surface elevations are lower (**Tables 4.5-7** through **4.5-9**), with some water surface elevations reduced slightly in relation to the "existing without-project" condition for the 0.01 AEP (100-year) event. However, in the NEMDC at Elverta Road and Elkhorn Boulevard, water surface elevations would increase to 0.32 and 0.40 feet (approximately 4 to 5 inches, respectively) in the 0.002 AEP (500-year) event under the Proposed Action or Fix-in-Place Alternative when compared to the No-Action Alternative.

In summary, implementation of the action alternatives would not measurably alter water surface elevations except in the most extreme circumstances [0.002 AEP (500-year) flood event] and only at the NEMDC at Elverta Road and Elkhorn Boulevard. The action alternatives would not change the existing geometry of the channels surrounding the Natomas Basin and therefore would not cause significant changes to water flow in these channels, or cause adverse hydraulic effects upstream or downstream of the project area during peak flows. In addition, these alternatives would not expose people or structures to a significant risk of flooding. Rather, this risk would be alleviated because seepage remediation measures would reduce the potential for seepage-induced failure, the waterside erosion repair measures would address existing and potential future erosion to protect levee stability, and additional remediation measures would protect against risks to levee integrity caused by beavers and burrowing animals. Because the action alternatives would replace or upgrade existing levees using up-to-date design and construction standards, implementation of either of these action alternatives would substantially reduce the risk of flooding of the Natomas Basin, which would be a **less-than-significant (beneficial)** impact. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.5-b: Alteration of Local Drainage

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, construction activities related to the project would not alter the local drainage systems described in Chapter 2.0, "Alternatives." There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could alter local drainage systems. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related effects on local drainage systems cannot be predicted. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The primary source of soil borrow material that would be used for the Phase 4b Project levee improvements along the Sacramento River east levee and the American River north levee would be the South Fisherman's Lake Borrow Area and the West Lakeside School Site, with the Fisherman's Lake Borrow Area as a back-up source. The primary source of borrow material for levee improvements along the PGCC and NEMDC North would be the Triangle Properties Borrow Area, the Krumenacher Borrow Site, and the Twin Rivers Unified School District Stockpile Site as back-up borrow sources. The Krumenacher Borrow Site and the Twin Rivers Unified School District Stockpile Site were previously analyzed as part of the Phase 3 Project EIS and EIR (see Section 4.1.3, "Summary of Previous NEPA and CEQA Analyses of Borrow Sites"). After excavation of the borrow material, these sites would be graded to allow positive draining by gravity, with no ponded open water, then returned to agricultural uses. Portions of the Triangle Properties Borrow Area, however, could be converted to detention basins to provide replacement storage for stormwater drainage for properties east of the PGCC, as shown on **Plate 2-13**. Five culverts underneath the PGCC currently allow some stormwater to drain from the area east of the PGCC into the northeast corner of the Natomas Basin. The Phase 4b Project includes an option to remove these culverts to address a potential risk to the integrity of the PGCC west levee.

Depending on the design of the detention basins, pumping stations may be needed to discharge water out of the basins and into the PGCC. Installation of culverts under Pierce-Roberts drain, Pleasant Grove Creek, and Curry Creek may also be needed to interconnect drainage subbasins. If constructed, detention basins would be located in the Triangle Properties Borrow Area after it is excavated to provide soil borrow materials for levee improvements. The detention basins and pumping facilities would be sized to handle runoff volumes of a 10-day storm event with a 0.01 AEP to protect structures, although temporary flooding of agricultural fields may be allowed during such an event.

A 200-acre managed marsh would be developed within the Brookfield Borrow Site **(Plate 2-13)**, which was previously excavated to provide soil borrow for construction of the NCC south levee. To provide irrigation to the site following the marsh creation and to eliminate the need to replace all of the on-site wells, the Chappell Ditch and Drain would be upgraded and extended to provide surface water to the Brookfield marsh and adjacent rice fields to the south and east (see **Plate 2-13**). The marsh would be managed to maintain a relatively consistent water level within the confines of the marsh and would not interrupt irrigation or drainage services to adjacent properties or change the route water levels in surrounding irrigation and drainage canals.

In addition to the Chappell Ditch discussed above, several other irrigation infrastructure components would be relocated or realigned to accommodate levee improvements and reduce underseepage potential: the West Drainage Canal, the Riego Road Canal, the Vestal Drain, the Morrison Canal, and private irrigation ditches and buried piping. The NEMDC low-flow channel would also be realigned at the I-80 overcrossing. As noted above, an NCMWC irrigation canal south of the Brookfield Borrow Site would supply water to the proposed managed marsh. The canal would be widened and extended to the east to service the marsh and increase availability of irrigation service in the area. This expansion could potentially affect the function of an adjacent drainage canal **(Plate 2-13)**. Drainage would need to be rerouted to new replacement canals before the existing canals are decommissioned to ensure that local drainage and ponding areas would not be adversely affected as a result of project construction. To prevent disruption of irrigation service, the private irrigation systems would be replaced with in-kind facilities. Detailed engineering and design plans for these replacements are still under development.

Up to 40 acres of woodlands, consisting of native riparian and valley oak woodland species, would be planted in the Lower Dry Creek drainage immediately east of the NEMDC **(Plate 2-14)**. During major storm events, portions of this area fill with runoff from Dry and Robla Creeks that backs up as it drains into the NEMDC downstream of the NEMDC Stormwater Pumping Station. Without careful selection of planting areas to avoid adverse hydraulic effects, such as increased channel roughness or displacement of flood storage capacity, this component of the Phase 4b Project could potentially contribute to local flooding of surrounding residential and

commercial areas during periods when the Lower Dry Creek drainage is acting as a floodway and/or flood storage area.

As part of the extension of the adjacent levee raise in Reach B:10–12A (Station 632+00 to Station 662+00), the drainage swale would be constructed between the levee and Garden Highway. No new waterside drainage outlets would be needed beyond the range of 7–10 outlets that were analyzed as part of the Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f), but the spacing between the outlets would increase, and one of the outlets would be located downstream of Powerline Road.

Because the action alternatives would temporarily or even potentially permanently alter the existing drainage pattern of the project area, localized flooding could occur, resulting in a **potentially significant** impact. ***(Similar)***

Mitigation Measure 4.5-b(1): Coordinate with Landowners and Drainage Infrastructure Operators, Prepare Final Drainage Studies as Needed, and Implement Proper Project Design

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

During project design, the project proponent's project engineers shall coordinate with owners and operators of local drainage systems and landowners served by the systems. This coordination shall enable the project engineers to evaluate the preproject and postproject drainage needs and the design features to consider in project design to prevent any substantial project-related drainage disruption or alteration in runoff that would increase the potential for local flooding. If substantial alteration of runoff patterns or disruption of a local drainage system could result from a project feature, a final drainage study shall be prepared to identify alternative means to provide equivalent irrigation and drainage services that would be implemented as part of project design. The study shall consider the design flows of any existing facilities that would be crossed by project features and shall develop appropriate plans for relocation or other modification of these facilities and construction of new facilities, as needed, to ensure that the altered systems provide drainage services during and after construction that are equivalent to the drainage services that were provided prior to construction. Any necessary features to remediate project-induced drainage problems shall be constructed before the project is completed or as part of the project, depending on site-specific conditions. Any additional coordination with landowners and drainage infrastructure operators related to future selection of borrow sites in the Fisherman's Lake Area shall be completed by the Project Proponent(s) before commencement of any earth-moving activities.

Responsibility:	Project proponent(s)
Timing:	Before construction

Implementing this mitigation would reduce the potentially significant impacts to local drainage to a **less-than-significant** level by enabling the project engineers to evaluate the preproject and postproject drainage needs and ensuring that the project is designed appropriately to prevent a substantial project-related drainage disruption, alteration of runoff patters, or disruption of the local drainage system. ***(Similar)***

Mitigation Measure 4.5-b(2): Prepare Hydraulic Study, and Design and Implement Lower Dry Creek Woodland Planting Areas to Avoid Adverse Hydraulic Effects

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

During project design, the project proponent(s) shall conduct a hydraulic analysis of the Lower Dry Creek Drainage. Woodlands shall only be planted in areas determined by the hydraulic analysis to have no adverse effects on the function of the drainage to provide flood services or otherwise contribute to local flooding in the surrounding areas.

Responsibility:	Project proponent(s)
Timing:	Before construction

Implementing this mitigation would reduce adverse hydraulic impacts of woodland plantings in the Lower Dry Creek Drainage through the preparation of a hydraulic study and the implementation of its recommendations to a **less-than-significant** level. ***(Similar)***

Impact 4.5-c: Effects on Groundwater

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly disturb groundwater recharge or flow. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding of the Basin, should it occur in the absence of improvements to the perimeter levee system, would not inhibit groundwater recharge. Therefore, there would be **no impact**. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Effects of Groundwater Well Relocations

A total of 18 private irrigation wells would need to be relocated outside of the Phase 4b Project levee improvements footprint. One well is located in the Sacramento River east levee Reach A:18B, nine wells are located along the west levee of the NEMDC, and eight wells are located along the west levee of the PGCC. Before levee construction commences, these existing wells would be abandoned, and replacement wells would be drilled at least 100 feet from the landside toe of the widened levees. Existing wells would be abandoned in accordance with the applicable state, county requirements to prevent future groundwater contamination. Because the replacement wells would be drilled in close proximity to the existing wells, and would be drilled to a similar depth within the aquifer, impacts to groundwater levels and yields would be negligible. The replacement wells would also have the same capacity as the existing wells and would be operated in a similar fashion. As a result, no substantial decrease in groundwater levels or well yields, or increase in pumping costs are expected to be caused by the relocation of the 18 private irrigation wells; therefore, this impact is considered **less than significant**.

Effects of Cutoff Walls on Existing Groundwater Wells

Cutoff walls would be installed in Sacramento River east levee Reach A:19B–20B (and potentially in Reach A:16–19A), American River north levee Reach I:1–4, and the west levees of the PGCC and NEMDC North. The cutoff wall in the PGCC west levee was originally proposed as part of the AEP 0.01 (100-year) levee raise analyzed as part of the Phase 3 Project, but would be constructed as part of the AEP 0.005 (200-year) levee addressed in the Phase 4b Project. The presence of cutoff walls could restrict the movement of groundwater in either direction (away from or toward the Sacramento River or NCC), potentially increasing or decreasing localized near-surface groundwater levels in areas immediately adjacent to the cutoff wall. A significant drop in groundwater levels could decrease the yields of nearby wells or increase the pumping costs of those wells. The combined effect of all of the NLIP construction activities (including the contribution of the Phase 4b Project) on the overall groundwater budget for the Natomas Basin under both existing and future conditions is discussed in Chapter 5, "Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements."

Luhdorff & Scalmanini Consulting Engineers (LSCE) conducted an analysis of the potential effect of the proposed cutoff walls on existing wells located within the Phase 4b Project area (**Appendix C4**). Along the NEMDC North, 13 domestic wells, 11 irrigation wells, and 2 industrial wells are located within the project footprint (Mead and Hunt 2009). The domestic wells mapped along the NEMDC North are 96–220 feet deep, with an average of 153 feet deep. The irrigation and industrial wells are 133–952 feet deep, with an average of 358 feet deep. Most of the drillers' logs available for these domestic wells do not show the perforated intervals, but the top of the perforations would likely be below the tip of the adjacent cutoff wall for almost all wells. The proposed cutoff walls would be about 20–60 feet deep from the toe of the levee, with a maximum depth of 110 feet. Most of the cutoff wall depths would be above the estimated average water table elevation. The combination of relatively deep wells and relatively shallow cutoff walls signifies that no impacts to nearby domestic wells would be expected.

Cutoff walls are proposed for Sacramento River east levee Reach A:19B–20. Seepage berms are the preferred method of seepage remediation in Reach A:16–19A, as shown on **Plate 2-7a**. However, use of cutoff walls in Reach A:16–19A has not been ruled out because geotechnical analysis and recommendations have not been finalized. As shown in Table 7 of the LSCE technical memorandum (**Appendix C4**), 18 domestic wells have been mapped along Sacramento River east levee Reach A:16–20, and these wells would potentially be in the vicinity of cutoff walls constructed as part of the Phase 4b Project. These wells range in depth from 90–180 feet, with an average of depth of 131 feet. Measurable impacts from installation of cutoff walls are considered unlikely in this portion of the Phase 4b Project area based on one or more of the following criteria for each well analyzed:

- the well is considerably deeper than the tip of the adjacent cutoff wall,
- the top of the perforated interval is below or only slightly above the tip of the proposed cutoff wall,
- the well is located relatively far away from the levee,
- the well is unused, or
- the well is scheduled for replacement because it is within the footprint of proposed levee improvements.

Most of the wells mapped along Sacramento River east levee Reach A:16–20 would not be affected by proposed cutoff walls because the wells would be deeper than the bottom of the cutoff walls, or the wells would be located far enough away from the cutoff wall that they would not experience any changes in local groundwater conditions. One irrigation well, located in Reach A:18 is within the proposed levee construction footprint and is currently scheduled for replacement. The replacement well would be drilled deep enough to avoid potential cutoff wall impacts. Some of the other wells within the construction footprint (see Figure 3 of the LSCE technical memorandum in **Appendix C4**) may also be replaced, although this has not yet been determined.

A few of the mapped and unmapped wells could be affected by planned slurry cutoff walls because they do not meet at least one of the above criteria. However, any decreases in well yield or other impacts to private wells as a result of cutoff wall installation would be expected to be small and not significantly affect well production. Well capacity data are limited in Sacramento River east levee Reach A:16–20, but the capacities of domestic wells located further north along the Sacramento River east levee average more than 60 gallons per minute (gpm) based on initial well test results shown on well completion reports contained in **Appendix C4**. The only well capacity estimate available for a domestic well in Reach A:16–20 is also 60 gpm. With such high capacities, domestic wells only need to pump for a few minutes a day to meet normal water demands. Therefore, very localized individual cones of depression for these wells would most likely not reach the adjacent cutoff wall, and no interference with pumping would occur. If a well's cone of depression were to reach the cutoff wall, there could be some additional drawdown and decrease in pumping capacity. However, because of the short pumping cycles, impacts would not be expected to be measurable.

As a result, no substantial decrease in well yields or increase in pumping costs is expected to be caused by the cutoff walls along the Sacramento River east levee and the west levee of NEMDC North; therefore, this impact is considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

4.5.3 RESIDUAL SIGNIFICANT IMPACTS

Because mitigation would not be required for the No-Action Alternative, impacts related to the continued exposure of the Natomas Basin to a significant residual risk of flooding are assumed to be significant and unavoidable. Under the No-Action Alternative, impacts to local drainage systems are uncertain. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration.

Implementation of the mitigation measures described in this section for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would reduce residual hydraulic impacts to a less-than-significaut level.

As noted in Section 2.5.1, "Residual Risk of Flooding," implementation of the Phase 4b Project would substantially lessen the probability of a flood in the Natomas Basin due to a levee failure. However, the Basin would remain subject to a residual risk of flooding, which would be the same under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. The project proponent(s) would be required to maintain a safety plan, as detailed in Section 2.5.1.

4.6 WATER QUALITY

4.6.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.6.1.1 METHODOLOGY

Water quality impacts that could result from project construction activities and project operation were evaluated based on the construction practices and materials that would be used, the location and duration of the activities, and the potential for degradation of water quality or beneficial uses of project area waterways.

4.6.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to water quality if they would violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality.

4.6.2 IMPACTS AND MITIGATION MEASURES

Impact 4.6-a: Temporary Impacts on Water Quality from Stormwater Runoff, Erosion, or Spills

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to directly degrade water quality from stormwater runoff. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Potential flooding and inundation of the Natomas Basin could introduce large quantities of agricultural pesticides, oil, gasoline, and other hazardous materials into waters and subsequently into stream channels and groundwater. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related impacts on water quality cannot be predicted. A precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Project implementation would include extensive ground-disturbing activities during construction, many of them near local drainages and waterways that could become contaminated by soil or construction substances. These waterways include the Sacramento River, the American River, the NEMDC, the PGCC, the NCC, and the West Drainage Canal. The Sacramento River is a receiving water for much of the drainage from the Natomas Basin (including agricultural drainage).

The Adjacent Levee Alternative (Proposed Action) would involve construction of an adjacent levee and seepage remediation along Reach A:16–20 of the Sacramento River east levee (including construction of cutoff walls,

seepage berms, relief wells, and landside slope flattening); installation of cutoff walls and slope flattening along Reach I:1–4 of the American River north levee; levee raising, levee widening, and seepage remediation (including installation of cutoff walls) along the west levee of the NEMDC between the NEMDC Stormwater Pumping Station and Sankey Road; and levee raising and slope flattening along the west levee of the PGCC. The Fix-in-Place Alternative would be the same as the Adjacent Levee Alternative (Proposed Action), but the width of the adjacent levee along Reach A:16–20 of the Sacramento River east levee would be reduced by 15 feet.

Both action alternatives would also involve waterside erosion protection improvements along the PGCC and NEMDC South; conversion of the Brookfield borrow site to managed marsh and improvements to the adjacent Chappell Ditch and Drain; West Drainage Canal realignment and bank improvements; relocation of the Riego Road Canal and Vestal Drain; modifications to RD 1000 Pumping Plant Nos. 1A,1B, 6, and 8 and City of Sacramento Sump Pumps 58, 102, and 160; borrow site excavation and reclamation at the South Fisherman's Lake Borrow Area, West Lakeside School Site, and the Triangle Properties Borrow Area; and landside vegetation removal in preparation for the levee improvements described above. The Fix-in-Place Alternative would require removal of vegetation on the waterside of the Sacramento River east levee in Reach A:16–20.

Fill material for levee construction would be excavated from sites in the South Fisherman's Lake Borrow Area, the West Lakeside School Site borrow area , and the Triangle Properties Borrow Area (see **Plates 2-7a**, **2-17**, and **2-13**, respectively). Following excavation, the South Fisherman's Lake Borrow Area would be returned to agricultural production. The Triangle Properties Borrow Area would be returned to agricultural production, although portions adjacent to the PGCC east levee would be converted to detention basins to store PGCC overflow. The West Lakeside School Site would be used for agricultural production or habitat. Some of these lands are bordered by active agricultural canals or ditches.

Planned construction activities would coincide with part of the rainy season. These activities have the potential to temporarily impair water quality if disturbed and eroded soil, petroleum products, or construction-related wastes (e.g., cement and solvents) are discharged into receiving waters or onto the ground where they can be carried into receiving waters. Soil and associated contaminants that enter receiving waters through stormwater runoff and erosion can increase turbidity, stimulate algae growth, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Accidental spills of construction-related substances such as oils and fuels can contaminate both surface water and groundwater. The extent of potential impacts on water quality would depend on the following factors: tendency for erosion of soil types encountered, types of construction practices, extent of the disturbed area, duration of construction activities, timing of particular construction activities relative to the rainy season, proximity to receiving water bodies, and sensitivity of those water bodies to construction-related contaminants.

Slurry that would be used for construction of new cutoff walls in the Sacramento River east levee, American River north levee, and the west levee of NEMDC North has a fluid consistency when being placed. Improper handling or storage could result in releases to nearby surface water, thereby degrading water quality.

Replacement of discharge pipes at the RD 1000 pumping plants and City of Sacramento sump pumps listed above would involve excavation and grading on the waterside of the Sacramento River east levee, American River north levee, and NEMDC west levee. These activities could result in discharge of sediment and construction-related substances such as oils and fuels into these waterways.

Excavated areas that fill with surface or groundwater during project construction (such as areas along the NEMDC west levee, the American River north levee, and the Sacramento River east levee) would require dewatering. Surface or groundwater extracted from dewatering operations typically contains high levels of suspended sediment and often high levels of petroleum products and other construction-related contaminants. This extracted water could be directly released to local receiving waters, thereby degrading water quality.

The potential for release of soil or construction-related materials into the NEMDC, the PGCC, the NCC, the West Drainage Canal, local drainages, and ultimately the American or Sacramento Rivers could adversely affect river water quality. This temporary construction-related impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.6-a: Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall file a Notice of Intent (NOI) to discharge stormwater associated with construction activity with the Central Valley RWQCB. Final design and construction specifications shall require the implementation of standard erosion, siltation, and good housekeeping BMPs. Construction contractors shall be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) and comply with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity (Order No. 2009-0009-DWQ). The SWPPP shall describe the construction activities to be conducted, BMPs that will be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that shall be conducted.

The SWPPP shall include the following:

- pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills),
- demonstration of compliance with all applicable Central Valley RWQCB standards and other applicable water quality standards,
- demonstration of compliance with regional and local standards for erosion and sediment control,
- identification of responsible parties,
- detailed construction timelines, and
- a BMP monitoring and maintenance schedule.

BMPs shall include the following:

- conduct all work according to site-specific construction plans that identify areas for clearing, grading, and revegetation so that ground disturbance is minimized;
- install silt fences near riparian areas or streams to control erosion and trap sediment, and reseed cleared areas with native vegetation;
- stabilize disturbed soils of the new or raised levees, existing levee removal areas, and borrow sites before the onset of the winter rainfall season; and
- stabilize and protect stockpiles from exposure to rain and potential erosion.

The SWPPP also shall specify appropriate hazardous materials handling, storage, and spill response practices to reduce the possibility of adverse impacts from use or accidental spills or releases of contaminants. Specific measures applicable to the project include, but are not limited to, the following:

- develop and implement strict on-site handling rules to keep potentially contaminating construction and maintenance materials out of drainages and other waterways;

- conduct all refueling and servicing of equipment with absorbent material or drip pans underneath to contain spilled fuel, and collect any fluid drained from machinery during servicing in leak-proof containers and deliver to an appropriate disposal or recycling facility;
- maintain controlled construction staging and fueling areas at least 100 feet away from channels or wetlands to minimize accidental spills and runoff of contaminants in stormwater;
- prevent substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses;
- maintain spill cleanup equipment in proper working condition. Clean up all spills immediately according to the spill prevention and response plan;
- develop a slurry spill contingency plan to respond to a potential for bentonite slurry spill and prevent slurry from entering the Sacramento River, American River, the NEMDC, or the NCC; and
- immediately notify the California Department of Fish and Game (DFG) and the Central Valley RWQCB of any spills and cleanup procedures.

BMPs shall be applied to meet the "maximum extent practicable" and "best conventional technology/best available technology" requirements and to address compliance with water quality standards. A monitoring program shall be implemented during and after construction to ensure that the project is in compliance with all applicable standards and that the BMPs are effective.

The project proponent(s) shall also file an NOI to discharge construction wastewater from dewatering operations with the Central Valley RWQCB. Construction contractors shall be required to comply with the conditions of the general NPDES permit for construction dewatering and other low threat discharges to surface waters (Order No. R5-2008-0081).

The project proponent(s) shall demonstrate compliance with applicable City of Sacramento stormwater management and erosion control regulations:

- The City's Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code), which includes preparing erosion, sediment, and pollution control plans for each construction phase and postconstruction, if necessary. The project's grading plans shall be approved by the City of Sacramento Utilities Department.
- The City's Stormwater Management and Discharge Control Code (Chapter 13.16 of the City Code), which regulates stormwater and prohibits nonstormwater discharges except where regulated by a NPDES permit.

Responsibility:	Project proponent(s)
Timing:	Prepare NOI and SWPPP before the start of project construction; implement SWPPP and BMPs during construction; and monitor effectiveness of measure during and at completion of construction
Enforcement:	Central Valley RWQCB and City of Sacramento

Several technical studies have been conducted regarding water-quality control feature impacts on groundwater (e.g., *California Stormwater Best Management Practices Handbooks* prepared by the California Stormwater

Quality Association [DWR 2007]) and surface water (e.g., *Truckee River Basin Stormwater Management Program-Program Years 2007–2012* [Lahontan RWQCB 2007]). These studies have determined that water-quality control features such as revegetation, erosion control measures, and detention and infiltration basins have been successful in avoiding water quality impacts (e.g., metals and organic compounds associated with stormwater are typically lost within the first few feet of the soil of the retention basins associated with groundwater). Technical studies associated with the Lahontan Development (residential and golf course development) demonstrated that the use of a variety of BMPs (e.g., source control, detention basins, revegetation, and erosion control) have been able to maintain surface water quality conditions in adjacent receiving waters (Martis Creek). Implementation of Mitigation Measure 4.6-a would reduce water quality impacts from temporary construction activities under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative because the project proponent(s) would conform with applicable local and state regulations regulating construction discharges, which would reduce temporary potentially significant impacts to a **less-than-significant** level. ***(Similar)***

Impact 4.6-b: Impacts to Sacramento River Water Quality from Pleasant Grove Creek Canal Detention Basin Discharges

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, the detention basins and pumping stations in the area between the PGCC east levee and the Union Pacific Railroad would not be constructed and operated; therefore, no potential exists for the Phase 4b Project to degrade the water quality of the Sacramento River from area drainage water and agricultural tailwater runoff. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Impacts to water quality as a result of levee failure would be the same as described in Impact 4.6-a under the No-Action Alternative (Potential Levee Failure). The potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would involve upgrades to or the removal of five culverts that currently drain the area east of the PGCC by passing water under the canal to drainage ditches along the landside of the PGCC west levee. The purpose of these culverts is to drain the area east of the PGCC when the PGCC is experiencing high flows. To mitigate for the loss of a drainage outfall area for properties east of the PGCC, five detention basins would be constructed in the area between the PGCC east levee and the Union Pacific Railroad to provide replacement storage for drainage (as shown on **Plate 2-13**). Depending on the design of the detention basins, pumping stations may be needed to discharge water out of the basins and into the PGCC. The detention basins and pumping facilities would be sized to handle runoff volumes of a 10-day storm event to protect structures, although temporary flooding of agricultural fields may be allowed during such events. The PGCC conveys drainage water south to the NEMDC, which conveys drainage water from Dry Creek, Arcade Creek, and the PGCC to an outfall on the Sacramento River near the confluence of the Sacramento and American Rivers.

Depending upon the time of year, water that would be pumped from the detention basins into the PGCC would be either agricultural tailwater or stormwater from areas east of the PGCC. These waters may contain excessive concentrations of pesticides, herbicides, nutrients, disease-carrying microorganisms, or salts. Without treatment,

discharges from the detention basin pumping stations could degrade the water quality of the Sacramento River. This impact would be **potentially significant**. ***(Similar)***

Mitigation Measure 4.6-b: Implement Best Management Practices and Comply with NPDES Permit Conditions for a Point-Source Discharge

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Prior to operation of the detention basin pumping stations for discharge of water into the PGCC (and ultimately the Sacramento River), the project proponent(s) shall file a report of waste discharge with the Central Valley RWQCB and comply with NPDES permit conditions for a point-souree discharge.

Responsibility:	Project proponent(s)
Timing:	File report of waste discharge prior to operation of the detention basin pumping stations; implement BMPs during construction; and monitor effectiveness of BMPs during and at completion of construction
Enforcement:	Central Valley RWQCB

Implementing this mitigation measure would reduce to a **less-than-significant** level the potential impact of detention basin pump discharges violating waste discharge requirements or substantially degrading water quality in the Sacramento River. ***(Similar)***

Impact 4.6-c: Effects on Water Quality from Groundwater Discharged by Relief Wells

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no relief wells would be installed; therefore, no potential exists for the Phase 4b Project to degrade water quality from groundwater discharged by relief wells. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Impacts to water quality as a result of levee failure would be the same as described in Impact 4.6-a under the No-Action Alternative (Potential Levee Failure). The potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

During major storm events, groundwater from relief wells used for seepage remediation under both action alternatives would be directed to existing RD 1000 or City of Sacramento pumping stations via pipes that would collect this drainage near the landside toe of seepage berms along Sacramento River east levee Reach A:16–19A. The water from the drainage pipe system, including the groundwater released from the relief wells, would ultimately be pumped into the Sacramento River. Groundwater may exceed contaminant levels under the Basin Plan's water quality objectives. Information about the quality of the groundwater in the areas where the wells are proposed is limited, although DWR has reported that an area between the Airport and the Bear River to the north has high levels of TDS, chloride, sodium, bicarbonate, manganese, and arsenic. It should be noted that relief wells are typically drilled to a shallower depth (approximately 50 feet) than the groundwater wells used by DWR for

water sampling (200 feet deep or greater); therefore, the data from the sample wells in the Natomas Basin may not reflect the quality of water at the shallow depths that would be in contact with the proposed relief wells. In addition, during the high surface-water events in which the relief wells discharge, the groundwater would be highly diluted with water that has seeped under the levee from the Sacramento River. The actual quality of groundwater released by the relief wells would not be known until tests at or in the vicinity of potential well sites are conducted. Because the release of untreated groundwater into the Sacramento River could adversely affect river water quality, this impact would be **potentially significant**. ***(Similar)***

Mitigation Measure 4.6-c: Conduct Groundwater Quality Tests, Notify the Central Valley RWQCB, and Comply with the Central Valley RWQCB's Waste Discharge Requirements and NPDES Permit

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s), in coordination with RD 1000, shall ensure that groundwater in the vicinity of potential relief well locations near the Sacramento River east levee is tested during project design and before well construction to ensure that discharge of extracted groundwater does not exceed maximum contaminant levels specified in Title 22. The project proponent(s) shall provide the Central Valley RWQCB with the results of these water quality tests and a conceptual plan for how the relief wells will be used (e.g., extracting and discharging groundwater), and shall comply with any waste discharge requirements and the NPDES permit issued by the Central Valley RWQCB.

Responsibility:	Project proponent(s)
Timing:	During project design and before well construction
Enforcement:	Central Valley RWQCB

Implementing this mitigation measure would reduce the potential impact on water quality in the Sacramento River from relief well discharges to a **less-than-significant** level because groundwater quality tests would be conducted, notification to the Central Valley RWQCB would be provided, and the project proponent(s) would comply with the Central Valley RWQCB's Waste Discharge Requirements and NPDES permit. ***(Similar)***

4.6.3 RESIDUAL SIGNIFICANT IMPACTS

Because mitigation cannot be required for the No-Action Alternative, water quality impacts related to the continued exposure of the Natomas Basin to a significant risk of flooding are uncertain. Because of this uncertainty, the potential impacts remain too speculative for meaningful consideration.

With implementation of Mitigation Measures 4.6-a, 4.6-b, and 4.6-c, there would be no residual significant impacts associated with the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative related to temporary and short-term stormwater runoff, erosion or spills, long-term discharges from PGCC detention basins, and long-term relief well discharges because the project proponent(s) would comply with applicable NPDES permit conditions and conduct groundwater quality tests.

4.7 BIOLOGICAL RESOURCES

4.7.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.7.1.1 METHODOLOGY

This section presents the methodology used to assess the potential impacts of the Phase 4b Project on biological resources, including sensitive habitats, terrestrial special-status species, and fisheries and aquatic resources.

Impacts to biological resources resulting from implementation of the Phase 4b Project were analyzed based on data collected during field surveys and review of existing documentation that addresses biological resources on or near the Phase 4b Project area. Biologists conducted multiple reconnaissance-level surveys of the project area during 2004–2009 as part of NLIP-related studies and planning efforts. Specific documents reviewed to support the analysis in this section include the NBHCP (City of Sacramento, Sutter County, and TNBC 2003); TNBC's annual monitoring reports; and multiple draft and USACE-verified wetland delineation reports that cover portions of the Phase 4b Project area (see Section 3.7.2.2, "Sensitive Biological Resources," under "Sensitive Aquatic Habitats").

The methodology used to preliminarily identify irrigation, drainage, and field canals and ditches within the Phase 4b Project area is consistent with the USACE-approved delineation methodology. Consistent with the overall approach to this document and for purposes of NEPA and CEQA compliance, the analysis of jurisdictional wetlands presented below encompasses all known potential borrow sites for the Phase 4b Project, including some that may not be used for the project. In addition to the potential impacts at the identified borrow sites, if any additional borrow sites are needed, they would need to be analyzed under separate supplemental environmental compliance documentation.

The California Natural Diversity Database ([CNDDB] 2009), the NBHCP, and TNBC monitoring reports were used as the primary sources to identify previously reported occurrences of special-status species in the project area and vicinity.

Impacts resulting from levee improvement activities were based on the assumption that disturbance could occur within a worst-case levee corridor footprint in Sacramento River east levee Reach A:16–20 that would be up to 460 feet wide under the Adjacent Levee Alternative (Proposed Action) and up to 445 feet wide under the Fix-in-Place Alternative. Worst-case footprints for the Phase 4b Project are shown in **Plates 2-7a**, **2-7b**, **2-9**, **2-11**, **2-13**, **2-14**, **2-16**, and **2-17**. It is likely that in many cases, however, engineering refinements, including measures to minimize habitat impacts, would reduce these worst-case levee corridor footprints further. Therefore, impacts in this section likely overestimate the magnitude of impacts associated with the levee footprint, which is permitted under NEPA and CEQA to ensure that the EIS/EIR does not underestimate the magnitude and intensity of anticipated impacts.

Natomas Levee Improvement Program Programmatic Conservation Strategy

The impact analysis methodology also considers the NLIP's programmatic conservation strategy developed by USACE and SAFCA, in consultation with other affected regulatory agencies, to offset impacts to sensitive habitats and special-status species that may be temporarily or permanently affected by the overall NLIP (Phase 1–4b Projects).

As discussed in Section 2.3.4, "Habitat Improvements," the programmatic conservation strategy would, in its entirety, substantially contribute toward the establishment of a valuable habitat reserve in the increasingly urbanized landscape of the Natomas Basin. The conservation strategy takes advantage of a unique opportunity provided by the NLIP, including the Phase 4b Project, to reconfigure and protect large nodes of habitat and connective corridors in the Basin at a landscape scale that would help to advance the goals and objectives of the

NBHCP and assist the Federal Aviation Administration (FAA) and the local Reclamation Districts (RD 1000 and RD 1001) in achieving their management goals. To date, other projects in the Basin have only provided piecemeal approaches to habitat protection and connectivity.

The NLIP's conservation strategy would create, restore, and preserve sensitive habitats in the Basin. The strategy would expand the amount of habitat protected in the Basin, establish the components that tie the preserves and disparate mitigation sites together in perpetuity under public ownership, and increase the quality and viability of this emerging habitat reserve. (See Section 2.3.4.3, "Phase 4b Project Habitat Elements," for a detailed description of conservation measures, monitoring components, and performance criteria associated with the conservation strategy.)

The conservation strategy has four primary goals:

1. Increase the amount of protected habitat and habitat corridors available for NBHCP-covered species.

2. Consolidate large areas of habitat to assist in the expansion of TNBC reserve blocks in the northwestern and southwestern regions of the Basin.

3. Improve the connectivity between core habitat reserves and other existing natural habitats distributed throughout the Basin, improve linkages between isolated wildlife populations, and substantially increase acreage and patch size of these critical habitats.

4. Meet regulatory compensatory mitigation requirements.

To meet these goals, managed marsh, managed grasslands, canals and associated uplands, valley oak woodlands and savannah, rice fields, and agricultural field crops would be preserved and/or created as part of the NLIP, including the Phase 4b Project. These elements provide important habitat for NBHCP-covered species, including aquatic and upland habitat for giant garter snake and other aquatic species, nesting and foraging habitat for Swainson's hawk and other raptors, and potential habitat for valley elderberry longhorn beetle.

Key programmatic conservation strategy elements relating to giant garter snake include:

- creating the GGS/Drainage Canal and improvements to the West Drainage Canal to enhance habitat functionality by linking known concentration of giant garter snakes in the Basin and TNBC properties in the northern and southern reserve areas that are managed for giant garter snake habitat,

- reclaiming and preserving existing rice fields within the Basin to compensate for any temporary losses of habitat, and

- creating managed marsh in the vicinity of Fisherman's Lake to expand and consolidate marsh habitat on TNBC preserves in the area and to compensate for permanent effects to rice fields and aquatic and upland features considered giant garter snake habitat.

Key programmatic conservation strategy elements relating to Swainson's hawk include:

- retaining the mature riparian tree corridor along the Sacramento River east levee and the NCC, which provide important nesting habitat for Swainson's hawk;

- increasing woodland acres, patch size, and connectivity (including creation of potential nesting habitat near Swainson's hawk foraging habitat); and

- preserving and creating foraging habitat (including grassland and agricultural upland).

Implementation of the NLIP conservation strategy would result in a net gain in aquatic habitat for giant garter snake (including canals, rice, and managed marsh); a net gain in foraging habitat (overall acreage of grassland and upland agriculture) for Swainson's hawk; and a net gain in woodlands that would provide more potential nesting and perching habitat for Swainson's hawk in the Basin than currently exists, and bring potential nesting and perching sites in closer proximity to areas that are managed as foraging habitat for this species in the Basin.

Although land acquisition and habitat preservation is a key component of the NLIP, including the Phase 4b Project, the primary benefit of the NLIP programmatic conservation strategy is the increased functionality and connectivity of habitat in the Natomas Basin. The NLIP, including the Phase 4b Project, would contribute to the large-scale conservation planning and substantial Basin-wide benefits to NBHCP-covered species through providing substantially better quality habitat. Examples include:

- designing new and replacement canals that require less maintenance, and thus less disturbance, through increased canal flow capacity and reduced erosion resulting from higher stability 3H:1V slopes;
- securing water supply for managed marshes and canals through long-term contracts with NCMWC;
- installing rock pile refugia and expanding upland banks along the new GGS/Drainage Canal providing giant garter snake habitat;
- improving precise and dependable water level control for managed marshes and canals provided by check structures and operational criteria;
- enhancing the West Drainage Canal, which currently provides low-quality habitat;
- preserving rice and agricultural field crops to the benefit of NBHCP-covered species in the Basin;
- creating landside woodland corridors; and, most of all,
- creating permanent linkages between giant garter snake populations in the southern and northwestern portions of the Basin.

These benefits would substantially reduce the collective impacts of the NLIP, including the Phase 4b Project, and would create a larger contiguous area protected and managed for giant garter snake, valley elderberry longhorn beetle, Swainson's hawk, and other NBHCP-covered species than currently exists.

Table 4.7-1 provides, by project phase, the habitat acreages that would be temporarily and permanently affected by implementation of the NLIP, and also shows the habitat acreages that would be preserved and/or created to compensate for temporary construction-related and permanent project footprint impacts. This information provides context to the overall impact assessment. The acreage estimates in **Table 4.7-1** are summarized for the Adjacent Levee Alternative (Proposed Action) only; impacts to habitat for all alternatives under consideration are addressed in Section 4.7.2 for each impact area.

As discussed in Section 2.3.4, "Habitat Improvements," the NLIP includes overall habitat conservation goals and strategies and improvements specific to each project phase. The following analysis considers the Phase 4b Project at a project level, as well as implementation of the NLIP programmatic conservation strategy covering all of the project phases. The programmatic biological opinion (BO) and project-level amended BO issued by the USFWS (**Appendix D1**), and the Phase 2 Project California Fish and Game Code Section 2081 incidental take permit issued by DFG, considered the entire NLIP habitat conservation strategy. Specific elements of the Phase 2 Project were included in the programmatic permitting documents, and subsequent project-level permits have been issued for the Phase 3 Project and will be issued for the Phase 4a and 4b Projects. The Phase 4b Project will require issuance of a project-level BO (see **Appendix D1**) and a Section 2081 incidental take permit. This approach was

Table 4.7-1
Habitat Impacts, Creation, and Preservation for the Natomas Levee Improvement Program by Project Phase

Species/ Habitat Type	Temporary Habitat Loss				Permanent Habitat Loss				Permanent Habitat Creation/Preservation				Permanent Habitat Net Gain/Loss				Total
	Project Phase				Project Phase				Project Phase				Project Phase				
	2	3	4a	4b	2	3	4a	4b	2	3	4a	4b	2	3	4a	4b	
Giant Garter Snake Habitat																	
Canals – aquatic	0.5	5.5	4	35	9	9	6	23	12.5	12.5	10.2	13	3.5	3.5	4.2	-10	**-1**
Canals – associated upland	21	36	1	48	3	6	-	58	29	27	48	100[1]	26	21	48	42	**137**
Non-canal aquatic/upland habitat (i.e., temporary impacts to rice)	180	-	48[2]	145	-	-	-	-	Up to 90	-			Up to 90	-			**Up to 90**
Non-canal aquatic/upland habitat (i.e., permanent impacts to rice or created detention basins and managed marsh)	-	-	-	-	23	45	1	259[3]	-	-	100	Up to 200	-	-	55	-59	**Up to -4**
Swainson's Hawk Habitat																	
Field/row crop	-	-	-	309	163	111	473	82	90	Up to 60[4]	127	-	-73	Up to -51	Up to -346	-82	**-552**
Grassland/ruderal	-	-	27	270	162	65	66	171	330	260	287	161	168	195	221	-10[5]	**574**
Landside woodlands	-	-	-	-	15	35	18	36	61	21	78	72	46	-14	60	35	**127**
Waterside riparian woodland[7]	-	-	-	-	0.5	1.4	3.64	7[6]	-	-	-	-	-0.5	-1.4	-3.64	Up to -7	**-13**

Notes: Net gain = acres permanent habitat loss – acres permanent habitat creation/preservation

GGS = giant garter snake; NEMDC = Natomas East Main Drainage Canal; O&M = operations and maintenance; PGCC = Pleasant Grove Creek Canal

[1] Assumes up to 200 acres of rice would be converted to managed marsh at the Brookfield property; excavation of the Brookfield borrow site was analyzed in the Phase 2 EIR and EIS.

[2] No-net-loss of habitat function because of concurrent conversion to managed marsh and subsequent long-term management, as part of the Phase 4a Project.

[3] 147 acres of detention basin would be created from rice habitat in the Triangle Properties Borrow Area; total impacts to rice within the Natomas Basin would be 84.45 acres.

[4] The combined total acreage for field/row crop created/preserved as part of the Phase 3 and 4a Projects (which could occur as part of one or both of these project phases) would be 60 acres, which would combine with the 90 acres created/preserved as part of the Phase 2 Project to reach a total of 150 acres for the Phase 2, 3, and 4a Projects.

[5] Grassland/ruderal habitat created includes levee slopes and seepage berm along the Sacramento River east levee Reach A:16–18B and the newly created levee slopes along the NEMDC. Swainson's hawk foraging habitat does not include the O&M corridor at the levee toe. No Swainson's hawk foraging habitat would be created along the PGCC because the impacts to habitat are calculated only on the Phase 4b Project, subtracting out the Phase 3 Project footprint. The O&M corridor along the PGCC would encroach on the Phase 3 Project footprint, resulting in only developed habitat (the new O&M corridor) within the Phase 4b Project footprint along the PGCC.

[6] Includes removal of waterside riparian woodland that could potentially be affected by implementation of USACE's encroachment policy for the NEMDC west levee; worst-case scenario is assumed that all trees along the NEMDC South would be removed from the levee crown to within 15 feet of the waterside levee toe. This also assumes removal of woody vegetation on the upper 2/3 of the American River north levee (Reach 1:1–4; Reach H from Northgate Blvd to Arden-Garden Connector).This portion of the impact would not result from temporary construction-related impacts. Under the Adjacent Levee Alternative (Proposed Action), it is assumed that woodland removal along the Sacramento River east levee and American River north levee would not be required because the levee prism would be wide enough.

[7] Waterside riparian woodland removal would occur along the west levee of NEMDC North and NEMDC South; and within the project footprint for RD 1000 Pump Plant Nos. 1A and 1B, and City Sumps 160, 120, and 58.

Source: Estimates calculated by AECOM in 2010

used because elements of the conservation strategy implemented in earlier phases of the NLIP included compensation for impacts from future project phases (including the Phase 4a and 4b Projects), and habitat creation and preservation that is part of the Phase 4b Project may provide compensation for impacts to habitat disclosed in environmental documents for the previous project phases.

4.7.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact if they would do any of the following:

- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS;
- substantially reduce the habitat of a fish species or cause a fish species to drop below self-sustaining levels;
- have a substantial adverse effect on native woodland habitats;
- have a substantial adverse effect on waters of the United States, including wetlands; or
- conflict with the provisions of the NBHCP.

4.7.2 IMPACTS AND MITIGATION MEASURES

Impact 4.7-a: Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, there would be no Phase 4b Project improvements to the Natomas perimeter levee system. Conformance with USACE guidance regarding levee encroachments, however, could require removal of riparian vegetation and woodlands (see **Table 4.7-2** for acreage) on the waterside of the Sacramento River east levee Reach A:16–20 and the NEMDC west levee; waterside riparian woodlands are not present along the PGCC. In addition, compliance with this guidance would also require removal of landside vegetation along Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, and the NEMDC west levee. These woodland habitats provide important wildlife habitat and movement corridors and contribute to Shaded Riverine Aquatic (SRA) habitat functions important for fish. Removal of waterside riparian woodland habitat would adversely affect important SRA habitat, including moderation of water temperatures, recruitment of woody debris, and introduction of insects that provide food for aquatic species. Removal of this habitat would also adversely affect terrestrial wildlife that use riparian woodlands, including Swainson's hawks that frequently nest in waterside woodlands. This impact would be **potentially significant**. ***(Greater)***

Table 4.7-2
Estimated Phase 4b Project Impacts on Woodland and Shaded Riverine Aquatic Habitats

Location	No-Action Alternative (acres)	Adjacent Levee Alternative (Proposed Action) (acres)	Fix-in-Place Alternative (acres)
Landside Woodland Removal [1]			
Sacramento River east levee (Reach A:16–20)	0.05	25.62	24.42
American River north levee (Reach 1:1–4)	6.91	6.91	6.91
West levee of NEMDC North	0.11	0.46	0.46
West levee of NEMDC South	1.98	1.98	1.98
Alignment of relocated West Drainage Canal	No impact	1.02	1.02
Subtotal	**9.05**	**35.99**	**34.79**
Waterside (SRA) Woodland Removal [2]			
Sacramento River east levee (Reach A:16–20)	19.2	No impact[3]	19.2
American River north levee – without variance (Reach 1:1–4; Reach H from Northgate Boulevard to Arden-Garden Connector)[4]	6.11	6.11	6.11
American River north levee – with variance (Reach 1:1–4; Reach H from Northgate Boulevard to Arden-Garden Connector) [5]	No impact	No impact	No impact
West levee of NEMDC North	0.01	0.01	0.01
West levee of NEMDC South – without variance[6]	1.15	1.31	1.31
West levee of NEMDC South – with variance[7]	0.57	0.73	0.73
City Sump 160	No impact	0.28	0.28
City Sump 102	No impact	0.09	0.09
City Sump 58	No impact	0.08	0.08
RD 1000 Pumping Plant Nos. 1A and 1B	No impact	0.02	0.02
Subtotal[8]	**25.89**	**7.32**	**26.52**
Total Losses (approximate)[9]	**35 acres**	**43 acres**	**61 acres**

Notes: NEMDC = Natomas East Main Drainage Canal; RD = Reclamation District; SRA = Shaded Riverine Aquatic habitat; USACE = U.S. Army Corps of Engineers

[1] All entries under No-Action Alternative assume that woodlands within 15 feet of the existing levee toe would be removed to comply with USACE levee vegetation requirements. All entries under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative assume that woodlands along the landside would be removed within the project footprint, including 15 feet from the landside toe of the widened levee.

[2] Assumes a variance is granted and woodlands are only removed from the crown of the levee to the upper 1/3 of the waterside slope, unless otherwise noted.

[3] Assumes that by moving the designated levee section landward, the adjacent levee design would create a hypothetical waterside levee slope that has a perpendicular separation of at least 5 feet from the waterside slope of the existing levee. The zone created by this separation contains the root structure of the woody vegetation on the waterside slope of the existing levee and allows the adjacent levee section to retain the safety, structural stability and functionality of a traditionally designed vegetation free levee section. The adjacent levee design thus reduces the conflicts between applicable USACE levee operation and maintenance requirements and waterside vegetation and structural encroachments.

[4] Assumes a worst-case scenario that no variance from USACE levee vegetation guidance is granted and the upper 2/3 of the waterside levee slope must be cleared.

[5] Assumes a variance from USACE Engineering Technical Letter such that no waterside vegetation removal would be required.

[8] Assumes removal of riparian woodlands from the waterside levee crown to within 15 feet of the waterside levee toe. Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, an additional 0.16-acre of woodland would be removed from the waterside of NEMDC South as required for the placement of erosion protection.

[7] Assumes a variance from the USACE engineering technical letter regarding levee vegetation such that only the waterside slope to the levee toe would have to be cleared. Approximately 18 trees would be removed. Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative; an additional 0.16-acre of woodland would be removed from the waterside of NEMDC South as required for the placement of erosion protection.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, an additional 0.16-acre of woodland would be removed from the waterside of NEMDC South as required for the placement of erosion protection.

[8] Assumes a worst-case scenario of woodland removal with no variance along the NEMDC South west levee.

[9] Approximate losses are calculated using the worst-case scenario for waterside woodland removal.

Source: Estimates calculated by AECOM in 2010 based on construction data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009

Potential Levee Failure

Without Phase 4b improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely or beneficially affect woodland habitats and SRA habitat, depending on timing, location, and duration of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of the impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Landside woodlands and waterside (riparian) woodlands in and adjacent to the Natomas Basin are considered sensitive habitats. They provide important nesting and roosting habitat for a wide variety of wildlife species (including special-status species such as Swainson's hawk) and serve as movement corridors for these species within the Basin. Waterside woodlands in particular are rich in biological fauna and flora and provide the primary source of nesting habitat for Swainson's hawk in the Natomas Basin. Waterside woodlands on the Sacramento River also provide SRA habitat function, which is important for fish and other Sacramento River aquatic resources.

SRA habitat includes the near shore aquatic habitat occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this cover type are: (1) an adjacent bank composed of natural, eroding substrates supporting riparian vegetation that either overhangs or protrudes into the water; and (2) water that contains variable amounts of woody debris, such as leaves, logs, branches, and roots and has variable depths, velocities, and currents. SRA habitat provides structure and food for various fish species. Shade decreases water temperatures, while low overhanging branches can provide sources of food by attracting terrestrial insects. As riparian areas mature, the vegetation sloughs off into the rivers, creating structurally complex habitat consisting of large woody debris that furnishes refugia from predators, creates higher water velocities, and provides habitat for aquatic invertebrates. For the Phase 4b Project, SRA loss is estimated as the acreage of canopy coverage from any trees or shrubs (woodlands) on the waterside of the existing Sacramento River east levee, American River north levee, or NEMDC waterside levee that would be affected by construction activities or compliance with USACE guidance regarding levee encroachments. Woody vegetation along the waterside of the PGCC and NCC does not qualify as SRA habitat because special-status fish species (i.e., anadromous salmonids) have limited access to these channels because of passage obstacles and the channels do not serve as migration pathways to upstream habitat areas. Further, the habitat quality in these waterways is limited by several other factors including water quality and warm water temperatures.

The Adjacent Levee Alternative (Proposed Action) would include removal of woodlands as follows: (1) on the landside of the Sacramento River east levee in the proposed adjacent levee footprint (Reach A:16–20); (2) on the landside and waterside of the American River north levee Reach I:1–4 and (3) on the landside and waterside along the NEMDC west levee as required for the levee modifications; (4) Sacramento River east levee, NEMDC west levee, and PCGG southwest levee as required for pumping plant modifications; and (5) in the footprint of the realigned West Drainage Canal. **Table 4.7-2** presents these impacts.

Impacts from loss of woodlands include short-term effects that would occur during the period it takes replacement plantings to mature. Although woodland habitat would be created to compensate for the loss of woodlands, replacement plantings do not provide habitat functions equivalent to the mature woodlands that would be removed for a minimum of 10–15 years. In the case of Heritage oaks, it would take several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed, which in some cases are likely 100 years old or older. Long-term impacts take into consideration compensation provided by replacement plantings, once created woodlands provide functional replacement habitat.

Temporal Loss (Minimum 10–15 Years) of Landside and Waterside Woodland Habitats (Except Heritage Oaks)

Construction of the adjacent levee under the Adjacent Levee Alternative (Proposed Action) would reduce the potential need to remove waterside woodlands (including those that provide SRA habitat function) along Sacramento River east levee Reach A:16–20 to meet USACE levee guidelines on vegetation clearance because it would shift the Sacramento River east levee prism landward. The Adjacent Levee Alternative (Proposed Action) would nevertheless result in the need for removal of several landside woodland groves and individual trees (see **Table 4.7-2** for acreages). It is anticipated that the small areas of woodlands that occur in the Triangle Properties Borrow Area can be avoided and that borrow activities would not result in loss of woodlands. In addition, as described in Section 2.3.1, "Flood Risk Reduction Components," the project proponent(s) would take measures to reduce and avoid impacts to Heritage oaks where feasible under levee design and seepage remediation performance requirements.

On the waterside of the levees that are part of the proposed Phase 4b Project, modifications to RD 100 Pump Plant Nos. 1A and 1B and City Sump 160 along the existing Sacramento River east levee, City Sump 58 along the American River, and RD 1000 Pump Plant Nos. 6 and 8, and City Sump 102 along the NEMDC would require removal of small amounts of riparian vegetation or woody material (see **Table 4.7-2** for acreages). Removal of riparian vegetation or woody material would also occur at erosion sites location on the NEMDC. Additionally, riparian vegetation and woody material along the waterside of the NEMDC west levee could potentially be removed to satisfy vegetation removal requirements of USACE encroachment policy. If implemented, this would result in the loss of individual trees that may provide SRA habitat function. The potential loss of trees (and associated potential SRA habitat) would result in reduced quality and quantity of important habitat for fish species and/or their prey species and potential nest trees for Swainson's hawks.

The Phase 4b Project would offset the loss of landside woodlands by preserving and creating landside woodlands (see **Table 4.7-3** for acreages); however, there would be a temporal loss of woodland habitat as the replacement plantings mature within a minimum 10–15 years, not including Heritage oaks, which require up to 100 years to reach maturity. This temporal impact due to loss of existing woodland habitat while the replacement plantings are maturing would be **significant**.

Long-Term and Permanent Impacts Due to Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats

The plan for compensation for impacts to landside woodland would include transplanting suitable trees from the Phase 4b Project area, where feasible, as well as planting a variety of native tree species to create woodland habitat. Potential sites for plantings to compensate for landside woodland impacts would include locations along Reach A:16 of the Sacramento River east levee, and along Lower Dry Creek, immediately east of the NEMDC.

These proposed compensatory measures would complement woodland preservation and creation activities carried out as part of the programmatic compensation strategy for the NLIP as shown in **Table 4.7-3**. When completed, the programmatic conservation strategy would result in a net gain in the amount of woodland habitat in the Natomas Basin. In addition, the conservation strategy would result in increased woodland grove size and connectivity, which would provide higher-quality habitat for fish and wildlife species that depend on woodlands and oak savannah. However, if habitat creation/preservation is not effectively implemented, the long-term loss of woodlands (including Heritage oaks) would result in a **potentially significant** impact.

Table 4.7-3
Estimated Phase 4b Project Impacts on Woodlands and Shaded Riverine Aquatic Habitats Following Compensation

Project Activity	Phase 4b Project Alternatives (acres)			Programmatic NLIP (Proposed Action–All Project Phases)[1] (acres)
	No-Action Alternative	Adjacent Levee Alternative (Proposed Action)	Fix-in-Place Alternative	
Landside				
Woodlands removed	15	36	35	90
Woodlands preserved	0	0	0	27
Woodlands created	0	72	70	210
Total Compensation	**0**	**Up to 72**	**Up to 70**	**Up to 237**
Net Gain or (Loss)	**0**	**36**	**35**	**247**
Waterside				
Woodlands removed[2]	17	19	15	16
Total Compensation[3]	**0**	**0**	**0**	**3.5**
Net (Loss)				**12.5**

Notes: Net Gain = Woodland Loss - (woodlands preserved + woodlands created)
NEMDC = Natomas East Main Drainage Canal; NLIP = Natomas Levee Improvement Program
[1] Programmatic NLIP acreages are based on impacts calculated in Table 6 of the Phase 4a Biological Assessment for impacts resulting from the Phase 2, 3, and 4a Projects; and includes impacts from the Phase 4b Project.
[2] Includes removal of waterside riparian woodland (assumes worst-case) that could potentially be affected by implementation of the USACE encroachment policy for the NEMDC west levee (approximately 17.35 acres) and project-related impacts. This portion of the impact would not result from construction-related impacts. Assumes that the Sacramento River east levee, American River north levee, and the portion of the NEMDC west levee between Northgate Boulevard and the Arden-Garden Connector would be wide enough under the Adjacent Levee Alternative (Proposed Action) that waterside woodland removal would not be required.
[3] Waterside woodlands (SRA) would not be created under the Phase 4b Project. However, 3.5 acres of waterside woodlands (SRA) was planted as part of the Phase 3 Project.
Source: Data compiled by AECOM in 2010

Fix-in-Place Alternative

The Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action), except that no adjacent levee would be constructed along Sacramento River east levee Reach A:16–20; instead, the existing levee would be widened in place. Under this alternative, however, in addition to the removal of landside woodland on the Sacramento River east levee, mature riparian woodland vegetation (i.e., trees and shrubs) along the waterside of the levee that provides SRA function would likely be removed to degrade the levee crown to construct cutoff walls and to conform with USACE guidance regarding levee encroachments (see **Table 4.7-2** for acreages).

The adverse effects of vegetation removal for the Fix-in-Place Alternative would be greater than under the Adjacent Levee Alternative (Proposed Action), particularly in terms of the quality of the habitat lost, but also in the amount of habitat lost. The loss of waterside riparian woodlands, including those that provide SRA habitat functions on the Sacramento River, would be much greater compared to that under the Adjacent Levee Alternative (Proposed Action).

The extensive riparian vegetation removal associated with the Fix-in-Place Alternative could substantially and adversely affect the wildlife that depend on waterside riparian woodlands for foraging and nesting habitat and could substantially adversely affect SRA habitat functions important for fish, including special-status fish. This impact would be **significant**. ***(Greater)***

Mitigation Measure 4.7-a: Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on woodland habitat, the project proponent(s) shall implement the following measures, which shall be in compliance with USACE levee vegetation guidance:

- Native woodland areas shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing shall be used during construction to prevent disturbance of native trees that are located adjacent to construction areas but can be avoided.

- The project proponent(s) shall coordinate with USFWS, National Marine Fisheries Service (NMFS), DFG, and the Sacramento County Airport System (SCAS) (if on Airport property) to ensure that all woodland habitat improvements of the NLIP are created and managed. The project proponent(s) shall prepare a project-specific Mitigation and Monitoring Plan (MMP) and append the programmatic Long-Term Management Plan (LTMP) to ensure the creation and long-term management of these components before construction commences. The project proponent(s) shall enter into agreements with the appropriate local entity responsible for long-term management of these created woodland habitats and shall coordinate with USFWS, NMFS, and DFG to ensure that performance criteria and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the MMP and LTMP. All performance criteria and long-term management goals will be in full compliance with the Endangered Species Act (ESA) and California Endangered Species Act (CESA). The project proponent(s) shall implement all terms and conditions of the agreements.

- Waterside riparian woodland along the Sacramento River, American River (e.g., Lower American River Mile 0.5 mitigation site), and NEMDC that provide SRA habitat functions shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing shall be used during construction to prevent disturbance of trees and shrubs that are located adjacent to construction areas but can be avoided.

- Waterside riparian forest and scrub (canopy acreage) shall be replaced using ratios established by NMFS. Mitigation shall be 1:1 for in-kind mitigation and 3:1 for out-of-kind mitigation. For example, if waterside removal of vegetation occurs on the lower portion of the levee slope below the ordinary high water mark (OHWM) and mitigation planting sites are only available above the levee bench hinge (located at the top of the lower slope), then mitigation shall increase to 3:1. Mitigation shall be conducted using native plant species, including an assemblage of grasses, sedges, shrubs, and trees. At

maturity, the riparian vegetation community would provide SRA functions. The project proponent(s) shall develop a detailed woodland planting design and management protocols in coordination with USFWS, NMFS, and DFG. A monitoring plan with performance criteria shall be developed and implemented to determine the progress of the woodland habitats towards providing adequate mitigation.

- The criteria for measuring performance shall be used to determine if the habitat improvement is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, shall be developed in consultation with USFWS, NMFS, and DFG, and shall include, but not be limited to:

  - percent survival of planted trees (from 65–85%),
  - percent survival of transplanted trees (from 60–85%), and
  - percent relative canopy cover (from 5–35%).

- The project proponent(s) shall also enter into agreements with entities responsible for long-term management of created SRA habitats to ensure that performance criteria and long-term management goals are met. The project proponent(s) shall provide assurances for habitat creation and management goals that are required by regulatory agencies with jurisdiction over these resources, and these assurances will be specifically detailed and outlined in the LTMP and MMP. Such agreements shall be coordinated with USFWS, NMFS, and DFG. The project proponent(s) shall implement all terms and conditions of the agreements.

- If SRA mitigation requirements cannot be met through restoration on-site, credits shall be purchased at a mitigation bank approved by the resource agencies (e.g., USFWS, NMFS, and DFG) for selling SRA credits.

- A Section 1602 Streambed Alteration Agreement from DFG shall be obtained before any trees within a stream zone under DFG jurisdiction are removed. The project proponent(s) shall comply with all terms and conditions of the streambed alteration agreement including measures to protect fish habitat or to restore, replace, or rehabilitate any SRA habitat on a no-net-loss basis.

- USACE shall initiate Section 7 consultation with NMFS under Section 7 of the Federal ESA, and the project proponent(s) shall consult or coordinate with DFG under CESA regarding potential impacts of the loss of SRA habitat on Federally listed fish species and state-listed fish species, respectively. The project proponent(s) shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes, including Section 2081 permit conditions, to ensure no net loss of SRA habitat functions.

Responsibility: Project proponent(s)

Timing: Before construction

Implementing this mitigation measure, along with the habitat improvements included as part of the Phase 2, 3, and 4a Projects, would reduce the Phase 4b Project's adverse effects on landside woodland habitat because the amount of landside woodlands that would be created and preserved as part of the Phase 2, 3, and 4a Projects along with woodland created as part of the Phase 4b Project would increase landside woodlands in the Basin (see **Table**

4.7-2 for acreages). The habitat improvements from mitigation implementation would reduce long-term impacts to landside woodland habitats loss to a **less-than-significant** level. However, this impact would remain **significant and unavoidable** for many years before reaching a less-than-significant level because replacement plantings would require a minimum of 10–15 years before providing important habitat components such as shade and structure and decades to replace old growth trees, such as Heritage oaks.

Impacts to woodlands and SRA habitat would remain **significant and unavoidable** for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because (1) replacement plantings would not reduce the temporary loss of mature trees to a less-than-significant level, and no feasible mitigation is available to fully reduce the magnitude of this impact; (2) replacement woodlands on the landside would not compensate for the extensive loss of mature waterside vegetation or for the loss of SRA habitat along the NEMDC and a portion of the American River north levee (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative), as well as along the waterside of Sacramento River east levee Reach A:16–20 under the Fix-in-Place Alternative; and (3) it may not be possible to create enough suitable SRA habitat to compensate for SRA losses, especially under the Fix-in-Place Alternative. ***(Greater)***

Impact 4.7-b: Disruption to and Loss of Existing Wildlife Corridors

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, there would be no Phase 4b Project improvements to the Natomas perimeter levee system. However, extensive removal of woodland located on the waterside of the Sacramento River east levee and NEMDC west levee would be required to conform with USACE guidance regarding levee encroachments (see **Table 4.7-2**). Removing a large portion of this riparian vegetation would adversely affect existing wildlife corridors by disrupting the movement and dispersal of the native birds and wildlife species that depend on woodland cover. This impact would be **potentially significant**. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely affect wildlife corridors by direct mortality to migrating species or the destruction rearing locations, including den and nest sites. Levee failure could also result in beneficial affects to wildlife corridors by increasing debris piles which may provide forage or resting locations for some species. The impact of flood waters on wildlife corridors is dependent upon the timing, location, and duration of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether adverse or beneficial, is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Disruption to and Loss of Aquatic Movement Corridors for Giant Garter Snake

Irrigation/drainage ditches and canals within the Phase 4b Project area and larger Natomas Basin serve as critical corridors for movement of aquatic species, particularly the giant garter snake. Adverse impacts on these corridors under the Adjacent Levee Alternative (Proposed Action) would consist of temporary disturbance and permanent loss of canals, ditches, and their associated habitat values due to filling, redesigning, and reconfiguring these facilities to accommodate project improvements.

Under the Adjacent Levee Alternative (Proposed Action), a small amount of canal habitat would be temporarily affected or permanently lost as a result of construction of proposed levee improvements along the Sacramento River east levee, NEMDC west levee, and PGCC west levee; and filling and relocating West Drainage Canal, Riego Road Canal, Vestal Drain, Morrison Drain, and portions of associated lateral supply pipes and private irrigation ditches (see **Table 4.7-1**). Along the PGCC west levee, the proposed levee raise overlaps with the footprint of the raise that was addressed as part of the Phase 3 Project, as shown in **Plate 2-13**. Only impacts from the increment of the Phase 4b Project footprint are addressed in **Table 4.7-1**. The relocation of the Riverside Canal was addressed as part of the Phase 4a Project EIS and EIR; however, the filling of the Riverside Canal to construct the adjacent levee along the Sacramento River east levee south of where the Phase 4a project ended is proposed as part of the Phase 4b Project and analyzed in this EIS/EIR. SAFCA, in consultation with USACE, proposes to offset temporary impacts to the existing West Drainage Canal, Riego Road Canal, Vestal Drain, and Morrison Drain through creation of the realigned and extended West Drainage Canal and the relocated Riverside Canal, which were analyzed under the Phase 4a Project in the Phase 4a EIS and EIR. The West Drainage Canal is expected to provide a higher habitat value relative to the canal that would be filled. The realigned West Drainage Canal would be designed to reduce maintenance requirements and resulting habitat degradation, and snake injury and mortality that could occur.

New canal habitat created as part of the programmatic conservation strategy of the NLIP (including creation of the GGS/Drainage Canal under the Phase 2 and Phase 3 Projects and proposed improvements to the West Drainage Canal as part of the Phase 4b Project) would provide new movement corridors for giant garter snake, partially offsetting the permanent loss of canal habitat. The configuration and preliminary design of these new corridors were specifically formulated to enhance giant garter snake movement opportunities between populations in the northern and southern portions of the Natomas Basin (see Section 2.3.4 for additional details). This is anticipated to provide an overall, long-term enhancement in the quality of aquatic movement corridors throughout the Basin. A detailed design of the West Drainage Canal is being developed by SAFCA, in consultation with USACE, and will be provided to USFWS and DFG for agency review. Protective mechanisms and specific management protocols are currently being prepared by SAFCA, in consultation with USACE and in coordination with USFWS and DFG. To provide adequate compensation for the canal habitat that would be lost, new canal and managed marsh habitat must be created and managed in a manner that provides the essential functions of habitat that would be lost. If this objective is not achieved, project impacts on aquatic movement corridors would be considered **significant**.

Disruption to and Loss of Movement Corridors for Bird Species

The existing woodland corridor along the landside of the Sacramento River east levee (Reach A:16–20), the waterside and landside of the American River north levee (I:1–4), and the waterside of the NEMDC west levee provides valuable nesting and rearing habitat for a variety of bird species. Under the Adjacent Levee Alternative (Proposed Action), substantial landside and waterside woodland would be removed (see **Table 4.7-2** for acreages).

To offset this impact from the loss of landside woodlands, the Phase 4b Project would plant up to 60 acres of woodland in mitigation planting sites described in Section 2.3.4.2, "Woodland Compensation," which would complement the woodlands created as part of NLIP programmatic conservation strategy, as shown in **Table 4.7-3**. However, this compensatory vegetation would not mature for a minimum of 10–15 years (and as long as 100 years for Heritage oaks), and its habitat value would therefore be limited in the near term when compared with the value of the existing landside woodlands that would be removed. The Adjacent Levee Alternative (Proposed Action) would leave the higher-quality waterside riparian woodland along Sacramento River east levee Reach A:16–20 largely undisturbed; thus, substantially preserving the integrity of the existing woodland corridors during the interim 10- to 15-year period while the new woodland plantings mature. The result of the Adjacent Levee Alternative (Proposed Action) (both at the project level and when considered in combination with the NLIP programmatic conservation strategy) would be a net increase in landside woodland habitat (see **Table 4.7-3**). Nevertheless, because of the time required for the woodland plantings to mature, especially to the level that would

replace Heritage oaks, and because the Phase 4b Project woodland planting program would not address the loss of waterside woodlands along the NEMDC, this impact would be **potentially significant**.

Fix-in-Place Alternative

Disruption to and Loss of Aquatic Movement Corridors for Giant Garter Snake

Impacts on the amount and quality of canal habitat under the Fix-in-Place Alternative would be the same as described for the Adjacent Levee Alternative (Proposed Action). Therefore impacts associated with the disruption to and loss of aquatic movement corridors is the same as described under the Adjacent Levee Alternative (Proposed Action). ***(Similar)***

Disruption to and Loss of Movement Corridors for Bird Species

Under the Fix-in-Place Alternative, the loss of landside woodlands would be slightly less than under the Adjacent Levee Alternative (Proposed Action). However, because the adjacent levee would not be constructed under the Fix-in-Place Alternative, extensive removal of large woody vegetation from the riparian corridor on the waterside of the Sacramento River east levee (Reach A:16–20) would be required to conform with USACE guidance regarding levee encroachments. As a result, the total amount of woodland acreage removed in Reach A:16–20 of the Sacramento River east levee would be greater under the Fix-in-Place Alternative. The impacts to large woody vegetation under the Fix-in-Place Alternative along the American River north levee and NEMDC west levee would be the same as the Adjacent Levee Alternative (Proposed Action) (see **Table 4.7-2**). The American River north levee is overbuilt and it is expected that vegetation removal along the waterside would not be required under either the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative.

Removal of a substantial portion of riparian vegetation would adversely affect the movement and dispersal of the native birds and wildlife species that depend on woodland cover. Therefore, the Fix-in-Place Alternative could adversely affect wildlife movement corridors and this impact would be **significant**. ***(Greater)***

Mitigation Measure 4.7-b: Implement Mitigation Measures 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code," and 4.7-e, "Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Improvements and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, and Obtain Incidental Take Authorization"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	To reduce impacts on wildlife corridors, the project proponent(s) shall implement Mitigation Measures 4.7-a, above, and 4.7-e, below.	
	Responsibility:	Project proponent(s)
	Timing:	See Mitigation Measures 4.7-a and 4.7-e

Implementing Mitigation Measure 4.7-a would ensure that significant adverse impacts on woodlands that provide wildlife movement corridors are minimized through the creation and preservation of landside woodlands, which would facilitate wildlife movement. These replacement woodlands would reduce effects on wildlife movement and dispersal to a **less-thau-significant** level.

Implementing Mitigation Measure 4.7-e would ensure that significant adverse impacts on irrigation/drainage ditches and canals that provide wildlife movement corridors are minimized through the creation of replacement

aquatic corridors, which would facilitate wildlife movement. Created canals that would serve as aquatic corridors would reduce effects on wildlife movement and dispersal to a **less-than-significant** level.

Implementing Mitigation Measures 4.7-a and 4.7-e would ensure that adverse effects on landside woodlands and irrigation/drainage ditches and canals that provide wildlife movement corridors are minimized through the creation of replacement woodland and aquatic corridors, which would facilitate wildlife movement. Created woodlands and canals along the landside would partially reduce the effects of wildlife movement and dispersal, but not to a less-than-significant level for impacts to landside woodlands and irrigation/drainage ditches and canals. However, because there is no known feasible mitigation that would adequately and fully compensate for the likely loss of waterside vegetation along the NEMDC South west levee under the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative and the Sacramento River east levee under the Fix-in-Place Alternative this impact would remain **significant and unavoidable**. ***(Greater)***

Impact 4.7-c: Direct and Indirect Impacts on Jurisdictional Waters of the United States

Potential temporary and permanent impacts on jurisdictional waters of the United States resulting from the Phase 4b Project are identified in **Table 4.7-4**.

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, the Natomas perimeter levee system would not be improved as a result of the Phase 4b Project and the proposed landscape and irrigation/drainage system modifications would not be implemented. There would be **no impact** on waters of the United States under USACE jurisdiction. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely or beneficially affect waters of the United States that occupy approximately 930 acres, or 1.7%, of the Basin (TNBC 2007). Because the exact level of impact would be dependent on the flooding duration, depth, rate, timing, and location, this impact is considered uncertain and a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Three primary borrow sources have been identified for the Phase 4b Project: West Lakeside School Site, the South Fisherman's Lake Borrow Area, and the Triangle Properties Borrow Area. The Phase 4b Project could also use borrow material from sources analyzed as part of the Phase 4a Project in the Phase 4a EIS and EIR—the Twin River Unified School District Stockpile Site, the Krumenacher Borrow Site, and the Fisherman's Lake Borrow Area (see Section 4.1.3, "Summary of previous NEPA and CEQA Analyses of Borrow"). Under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, use of new Phase 4b Project borrow sites would require the permanent fill of waters of the United States including drainage ditches, irrigation canals, and irrigated wetlands. The total acreage of fill is not known at this time. Impacts associated with haul road construction across various drainage canals would be temporary, and these resources would be restored to pre-project conditions after project completion.

Table 4.7-4
Estimated Potential Direct and Indirect Impacts of the Phase 4b Project on Jurisdictional Waters of the United States

Project Feature	Functional Value[1]	Adjacent Levee Alternative (Proposed Action)		Fix-in-Place Alternative	
		Temporary Impact (acres)	Permanent Impact (acres)	Temporary Impact (acres)	Permanent Impact (acres)
Construction of Sacramento River east levee, American River north levee, NEMDC west levee[2], and PGCC west levee[2] Improvements					
Irrigation and drainage ditches (fill)[2]	Low	-	1.40	-	1.40
Wetlands (fill)[2]	Low	-	0.3	-	0.3
Construction of Erosion Repair					
Irrigation and drainage ditches (fill)[2]	Low	-	-	-	-
PGCC waterside erosion control rip rap (fill)	High	-	14.50	-	14.50
NEMDC waterside erosion control rip rap (fill)	High	-	5.49	-	5.49
Erosion repair (dewatering of PGCC)	High	14.50	-	14.50	-
Erosion repair (dewatering of NEMDC)	High	5.49	-	5.49	-
Construction of Relocated West Drainage Canal					
Irrigation and drainage ditches (fill)	Low	-	0.19	-	0.19
Irrigation ditches (Dewater of Existing West Drainage)[3]	Low	12.96	-	12.96	-
Construction of Relocated Riego Road Canal Vestal Drain, Morrison Canal, Chappell Ditch, and Private Irrigation					
Irrigation and drainage ditches (fill)	Low	-	0.02	-	0.02
Dewater of existing Riego Road canal	Low	-	0.68	-	0.68
Construction of Flood Protection at SR 99					
Dewater and fill of NCC	Low	0.69	0.69	0.69	0.69
Fill of seasonal wetland	Low	-	0.43	-	0.43
Fill of irrigated wetland[4]	Low		<27		<27
Replacement of RD 1000's Pumping Plant Nos. 6 and 8 and City Sump Pumps 102 and 160					
Intake channel modification (dewater)	High	-	0.50	-	0.50
Sacramento River waterside outfall construction (fill)[5]	High	-	0.03	-	0.03
NEMDC waterside outfall construction (fill)	High	-	0.76	-	0.76
Borrow Site and Haul Road Construction					
South Fisherman's Lake drainage ditches and canals (fill/dewater)	Low	-	1.38	-	1.38
West Lakeside School Site Borrow Area	Low	0.26	-	0.26	-
Irrigated wetlands in Triangle Properties Borrow Area (fill)[6]	Low	<290	<147	<290	<147
Total (approximate)		**324**	**199**	**324**	**199**

Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; SR = State Route

[1] Functional value definitions: High = Natural structure and function of biotic community maintained, with minimal changes evident. Moderate = Moderate changes in structure and function of biotic community—i.e., moderate level of disturbance. Low = Severe changes in structure and/or function of biotic community evident—i.e., high level of disturbance. See Section 3.3.7 in Chapter 3, "Affected Environment," for additional information.

[2] A portion of the Phase 4b Project area along the PGCC west levee overlaps within the previously analyzed Phase 3 EIS and EIR. Only impacts unique to the Phase 4b Project are reported here.

[3] The entire West Drainage Canal would be dewatered for improvements; however, only a 3.99-acre/4,700-foot-long section would be relocated.

[4] Chappell Ditch and Drain improvements would occur in areas that are currently in rice production; irrigated wetlands are generally a small component of actively farmed rice fields.

[5] Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act authorizations are required for work on the waterside of the levee.

[6] Approximately 290 acres of rice is present on the Triangle Properties Borrow Area; irrigated wetlands are generally a small component of actively farmed rice fields. Permanent impact assumes the worst-case scenario that 147 acres of shallow detention basins could not be returned to rice production.

Source: Data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009; data compiled by AECOM in 2010

A wetland delineation has not been completed for the Triangle Properties Borrow Area; however, it is expected that the rice fields in the Triangle Properties Borrow Area could contain irrigated wetlands. For the purposes of this analysis, the impacts described above are considered permanent. Vernal pools are present within the Triangle Properties Borrow Area on approximately 85 acres; areas with vernal pool complex would not be used for borrow source material and this habitat would remain undisturbed. The total acreage for temporary impacts noted in **Table 4.7-4** is the potential acreage of temporary impacts if all borrow sites are completely disturbed within their excavation footprints, which is up to 290 acres (worst-case) within the larger borrow area.

Construction of the adjacent levee along Sacramento River east levee Reach A:16–20 under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would result in potential impacts to waters of the United States, including wetlands (fill of irrigation and drainage ditches). Impacts to waters of the United States, including wetlands, would also occur from:

- raising and widening the west levee of NEMDC North;
- bank protection in the PGCC and NEMDC (including relocation of the low-flow channel in NEMDC South);
- relocating irrigation ditches along the NCC south levee and the west levees of PGCC and NEMDC North; and
- removing culverts under the PGCC.

Fill associated with levee modifications would occur in irrigated wetlands along the PGCC and NEMDC. Fill of seasonal wetlands and vernal pools would occur along NEMDC North as a result of levee raising and widening. Relocation and extension of the West Drainage Canal, Riego Road Canal, Vestal Drain, and Morrison Canal would result in permanent fill of drainage and irrigation ditches, and irrigated wetlands in rice fields.

Under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, the discharge pipes associated with RD 1000's Pumping Plant Nos. 1A and 1B along the Sacramento River east levee, Pumping Plant No. 6 along the NEMDC North, Pumping Plant No. 8 along the NEMDC South, City Sump 160 along the Sacramento River east levee, City Sump 102 along the NEMDC South, and City Sump 58 along the American River north levee would be replaced. Additionally, dewatering and new outfall construction would be required for all pumping plants except RD 1000 Pumping Plant Nos. 1A and 1B. Most of the outfalls would be placed above the OHWM and would not be expected to qualify as fill of waters of the United States under Section 404 of the CWA. Outfall installation, however, would result in temporary impacts due to dewatering within waters of the United States. The installation of these outfalls would result in the removal of some minor amounts of riparian vegetation (see Impact 4.7-a, above).

Replacement of the discharge pipes would consist of raising the pumping plants' discharge pipes, extending the pipes to tie into existing discharge pipes within the waterside bench, and replacing or modifying pumps and motors. Seepage remediation in these locations may be required, including relocating the landside stations away from the levee to accommodate the raised discharge pipes. Modifications to the landside intake channel of RD 1000 Pumping Plant Nos. 6 and 8 may also be required. The waterside levee slope of RD 1000 Pumping Plant No. 8 would require partial regrading to accommodate the raised pump discharge pipes.

Lower Dry Creek, located east of the NEMDC, has been identified as a planting area to compensate for the Phase 4b Project's removal of landside trees. Seasonal wetlands, vernal pools, freshwater marsh, and intermittent drainages are present within the planting area. Woodland mitigation plantings would not result in fill to waters of the United States; however, temporary impacts may occur from hauling woodland plantings and associated materials to planting sites.

A detailed design of aquatic habitat for the realigned and enhanced portion of the West Drainage Canal would be developed, and protective mechanisms and specific management protocols are currently being prepared by SAFCA, in consultation with USACE, USFWS, and DFG. To provide adequate compensation, these aquatic habitats would need be created and managed in a manner that would provide the essential functions of the habitats that would be lost. Therefore, an overall adverse impact on waters of the United States could occur if habitat

creation and management are not properly implemented. This impact is considered **potentially significant**. *(Similar)*

Mitigation Measure 4.7-c: Minimize Effects on Jurisdictional Waters of the United States; Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled or Dewatered; and Comply with Section 404, Section 401, Section 10, and Section 1602 Permit Processes

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce impacts related to loss or fill of waters of the United States, including wetlands:

- Waters of the United States, including wetlands, shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist(s), that construction is implemented in a manner that minimizes disturbance of canals, ditches, and seasonal wetlands. Temporary fencing shall be used during construction to prevent disturbance of waters of the United States that are located adjacent to construction areas, but can be avoided.

- To mitigate for permanent impacts to sensitive aquatic resources, at least 1 acre of aquatic habitat (irrigation/drainage canal) or 1 acre of seasonal wetland/vernal pool shall be created for every acre that is lost to ensure no-net-loss of sensitive aquatic habitat. The mitigation ratio that is ultimately required will be determined by USACE through the Section 404 permitting process or USACE internal equivalent process. Features planned in the Phase 4b Project (under both action alternatives), would provide aquatic habitat that has been designed to offset the effects described above. These features include the creation of aquatic habitat resulting from construction of the relocated West Drainage Canal; creation of managed marsh at the Brookfield borrow site; and creation of managed marsh at Fisherman's Lake, which was included as part of the Phase 4a Project and analyzed in the Phase 4a EIS and EIR. Most acreage associated with the relocated West Drainage Canal, the managed marsh habitat at the Brookfield borrow site, and at Fisherman's Lake would meet the criteria for waters of the United States, including wetlands.

- Develop and implement a Mitigation and Monitoring Plan and Long-Term Management Plan in coordination with and subject to approval of USACE (only if SAFCA implements the Phase 4b Project), USFWS, and DFG. The MMP and LTMP shall provide complete detailed designs of habitat creation components, performance criteria, and management protocols. The project proponent(s) shall also enter into agreements with entities responsible for long-term management of created canals and marsh habitats to ensure that performance criteria and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be met and specifically detailed and outlined in the LTMP and MMP. All performance criteria and long-term management goals will be in full compliance with ESA and CESA.

  The project proponent(s) shall secure all such agreements and implement all conditions of the agreements as follows: obtain the following applicable permits before the start of construction activities that would affect the resources covered by these permits: an individual permit pursuant to Section 404 of the CWA and Section 10 of the Rivers and Harbors Act from USACE (if the Phase 4b Project is implemented by SAFCA), Section 401 certification from the Central Valley RWQCB, and a Section 1602 Streambed Alteration Agreement from DFG (which applies to either USACE or SAFCA). All requirements of these permitting processes shall be implemented by the project proponent(s), as identified above.

Responsibility:	Project proponent(s)
Timing:	Before construction

Overall, the action alternatives would include creating waters of the United States that are expected to be more extensive than those filled by the Phase 4b Project, and implementing this mitigation measure, including coordination with and issuance of the permits by the aforementioned resource/regulatory agencies, would ensure no-net-loss of sensitive aquatic habitats occurs and that new jurisdictional waters would be managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost. Therefore, both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, with implementation of this mitigation measure, would have a **less-than-significant (beneficial)** impact on the overall acreage and function of waters of the United States in the Natomas Basin. ***(Similar)***

Impact 4.7-d: Potential Loss of or Disturbance to Special-Status Plant Species and Their Habitats

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project improvements would occur; therefore, there would be **no impact** on special-status plant species and their habitats. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely or beneficially affect special-status plants and their habitats, depending on timing, location, and duration of flooding. For example, flooding could destroy existing marsh habitats but at the same time create new riparian habitats. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether beneficial or adverse is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Of the six special-status plant species that were determined to have the potential to occur in the Phase 4b Project area (rose mallow, Delta tule pea, Sanford's arrowhead, dwarf downingia, Bogg's Lake hedge-hyssop, and legenere), all would occur in aquatic habitats (see Section 3.7.2.2, "Special-Status Plant Species," for further discussion). Focused surveys were conducted by AECOM botanists in July 2009 within the Phase 4a and 4b Project areas for rose mallow, Delta tule pea, and Sanford's arrowhead. No special-status plants were found in the areas surveyed; however, the survey was conducted outside of the blooming period for dwarf downingia, Bogg's Lake hedge-hyssop, and legenere. Habitat quality for these three species is considered low within the Phase 4b Project area. The Triangle Properties Borrow Area (**Plate 2-13**) has not been surveyed for special-status plants. Because no surveys have been conducted within the Triangle Properties Borrow Area, the potential for special-status plant species occurrence cannot be entirely dismissed. Therefore, this impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.7-d: Minimize Impacts on Special-Status Plant Species

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce impacts to special-status plant species:

- Areas that have the potential to support special-status plant species shall be surveyed by a qualified botanist. To identify special-status species in accordance with DFG and CNPS protocol, the focused rare plant survey shall be conducted during the appropriate time of year when the target species would be clearly identifiable. If no evidence of special-status plants is found in the survey area, no further mitigation is necessary.

- If special-status plants are found, information on the special-status plant populations shall be recorded in the field on CNDDB data forms. These forms shall be submitted to the CNDDB upon completion of the survey. If the populations can be avoided, they shall be clearly marked in the field by a qualified botanist for avoidance during construction activities. If special-status plant populations cannot be avoided, consultations with USFWS and/or DFG may be required depending on the listing status of the species present. These consultations shall determine appropriate mitigation measures for any special-status species populations that would be affected by the implementation of the project. Appropriate measures may include the creation of off-site populations through seed collection or transplanting, preservation and enhancement of existing populations, or restoration or creation of suitable habitat in sufficient quantities to compensate for the impact. Performance criteria would include replacement ratios and rate of survival for replacement populations designed to achieve no net loss of the special-status plant population. The project proponent(s) shall implement all mitigation measures determined necessary during this consultation.

Responsibility:	Project proponent(s)
Timing:	Before construction

Implementation of Mitigation Measure 4.7-d would reduce the impact of the Phase 4b Project on potential special-status plant species that may be encountered in the Triangle Properties Borrow Area to a **less-than-significant** level because focused rare plant surveys would be conducted to determine presence/absence and appropriate measures to avoid or reduce impacts to such species would be implemented. ***(Similar)***

Impact 4.7-e: Giant Garter Snake Mortality, Injury, and/or Disturbance to Habitat

Table 4.7-5 summarizes the Phase 4b Project's permanent impacts on giant garter snake habitat.

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project improvements would occur. Because no habitat would be affected, there would be **no impact** on giant garter snake. ***(Lesser)***

Table 4.7-5
Permanent Impacts of the Phase 4b Project on Giant Garter Snake Habitat

Location	No-Action Alternative	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative (acres)
Habitat Impacts		
Canal/ditch (Sacramento River east levee, NEMDC west levee, PGCC west levee, Vestal Drain, Morrison Canal, West Drainage Canal, and NCC)	Unknown, but losses of The Natomas Basin Conservancy preserve habitat and other agricultural habitats in the event of flooding could be substantial	23
Rice (PGCC west levee, NEMDC west levee, West Drainage Canal, Vestal Drain, Morrison Canal, Riego Road Canal, Chappell Ditch, private irrigation relocation, and creation of detention basins within the Triangle Properties Borrow Area)	Unknown, but losses of rice in the event of flooding could be substantial	259[1]
Total Permanent Impacts	**Unknown, but potentially substantial**	**Canal/Ditch: 23 Rice: 259**
Habitat Creation (Phase 4b Project)		
West Drainage Canal improvements and realignment[2]	-	Up to 13
Creation of managed marsh at Brookfield borrow site[3]	-	Up to 200
Total Habitat Creation	-	**Up to 213**
Net Habitat Gain	**Unknown**	**GGS/Drainage Canal: 13 Managed Marsh: up to 200**

Notes: EIR = environmental impact report; EIS = environmental impact statement; GGS = giant garter snake; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal

[1] Assumes worst-case scenario that excavated detention basins cannot be returned to rice. If detention basins can be returned to rice, impacts would be substantially reduced (by approximately 147 acres).

[2] Created canal habitat is considered to provide higher quality habitat than rice or canals for giant garter snake.

[3] Excavation of the Brookfield borrow site was analyzed in the Phase 2 EIS and EIR and Phase 3 EIS and EIR. As part of the Phase 4b Project, up to 200 acres of this property may be converted from rice to managed marsh habitat to compensate for the Phase 4b Project's impacts to 112 acres of rice. Creation of managed marsh is considered to provide higher quality habitat than rice for giant garter snake.

Source: Construction data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009; data compiled by AECOM in 2010

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure could result in an adverse impact on the Natomas Basin giant garter snake population. Giant garter snakes require upland refugia and may not be able to escape flood waters during their inactive season (October–April), depending on the velocity and depth of the floodwaters and the speed with which the floodwaters inundate the Basin. A catastrophic flood of the Natomas Basin could result in direct mortality of a substantial portion of the Basin's giant garter snake population, as well as extensive damage to habitat for the species, including TNBC preserves and the infrastructure that supports operation of the preserves. The magnitude of the impacts would depend upon the flooding duration, depth, rate, timing, and location; therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction-Related Impacts to Giant Garter Snake

Project construction and implementation would result in permanent and temporary loss and disturbance of potential giant garter snake habitat. Temporary loss of habitat is defined as habitat being unavailable or unusable for one giant garter snake active season. Fill, temporary and permanent dewatering, land conversion, and staging and other construction disturbances could disturb, injure, or kill snakes using affected habitats, including irrigation ditches, drainage canals, rice fields, and associated uplands. Project construction activities in areas of potentially suitable habitat, as well as geotechnical and cultural resource investigations conducted near suitable habitat, could also result in direct disturbance and loss of individual giant garter snakes. Construction-related adverse impacts on giant garter snake habitat within the Phase 4b Project footprint would occur along Sacramento River east levee Reach A:16–18B as a result of the realignment of a portion of the West Drainage Canal and bank improvements to the rest of the canal; along the NCC, PGCC, and NEMDC as a result of relocation of Riego Road Canal, Vestal Drain, and Morrison Canal; and within the South Fisherman's Lake and Triangle Properties Borrow Areas.

Permanent loss of aquatic giant garter snake habitat in the Phase 4b Project area would include the loss of lateral canals that would be abandoned as a result of the realignment of a portion of the West Drainage Canal (**Plate 2-17**), as well as a small area of cultivated rice within the relocated West Drainage Canal alignment. The relocation of the Vestal Drain and the Riego Road Canal would result in permanent impacts to cultivated rice along the south levee of the NCC and the west levee of NEMDC North, respectively. Levee widening would result in a permanent loss of cultivated rice habitat along the west levees of the PGCC and NEMDC North. Permanent loss of aquatic giant garter snake habitat would also occur in the Triangle Properties Borrow Area from creation of detention basins in cultivated rice (**Plate 2-13**). Six erosion sites have been identified on the waterside of the PGCC and NEMDC for levee slope erosion repair, placement of rip rap, and/or channel realignment (**Plates 2-13** and **2-14**). The low-flow channel of the NEMDC south of City Sump Pump 157 requires realignment, and a rock berm would be installed between the City sump pump and the realigned low-flow channel. Installation of a beaver wall along the PGCC, and erosion site repair along the PGCC and NEMDC South, would result in permanent impacts to giant garter snake habitat below the OHWM of the PCGG and NEMDC (see **Table 4.7-5** for acreage).

Temporary loss/disturbance of giant garter snake habitat would result from relocating and extending the West Drainage Canal. This impact would be temporary because the new (realigned) West Drainage Canal would be constructed and would be functional at least one giant garter snake season before impacts occur to the existing West Drainage Canal. The realigned West Drainage Canal is expected to provide a higher habitat value relative to that of the canal that would be filled, and the realigned West Drainage Canal would be designed to minimize maintenance requirements, thus reducing the likelihood of snake injury and mortality associated with canal maintenance. A small amount of aquatic habitat could also be temporarily disturbed in areas where the replacement of irrigation/drainage canals connect to existing lateral canals and in areas where pumping plants are relocated or modified. This impact would be **potentially significant**.

A portion of the Triangle Properties Borrow Area supports rice fields that provide giant garter snake habitat. Because these rice fields would be returned to rice production, the impacts of borrow activities on these rice fields are considered temporary as the habitat would be unsuitable as giant garter snake habitat for one active season and restored to a similar or higher-quality habitat upon the completion of borrow activities. Managed marsh is considered higher quality habitat than rice fields because rice provides suitable habitat only for one-third of the year (when it is flooded) and does not generally provide suitable habitat year-round (e.g., winter upland refugia are absent). Mitigation would be required to ensure that impacts to giant garter snake from overlapping uses of borrow areas are temporary and do not affect current habitat in borrow areas for more than one construction season. A portion of the Triangle Properties Borrow Area used for borrow would be restored to rice fields that also serve as detention basins for winter stormwater. If these rice field/detention basins cannot be restored to

workable rice fields during reclamation, the result would be the permanent loss of giant garter snake habitat (see **Table 4.7-5** for acreage). This impact would be **potentially significant**.

Up to 200 acres of the Brookfield borrow site may be converted from rice to managed marsh habitat as part of the Phase 4b Project, resulting in a beneficial impact to giant garter snake. Excavation of the Brookfield borrow site was previously analyzed in the Phase 2 EIS and EIR and Phase 3 EIS and EIR. The conversion of 200 acres of rice habitat to managed marsh habitat would be a **beneficial** impact to giant garter snake.

Beneficial impacts to giant garter snake would also result from implementation of the NLIP and its associated programmatic conservation strategy (see Section 4.7.1.1, "Methodology"). The NLIP conservation strategy is expected to result in an overall net gain in garter snake habitat in the Basin (**Table 4.7-1**) and an overall improvement in habitat conditions for giant garter snake. Benefits to giant garter snake in the NLIP programmatic conservation strategy that were included in earlier project phases are the creation of giant garter snake habitat resulting from construction of the new West Drainage Canal, the relocation of Elkhorn Canal (Phase 3 Project), and the relocation of Riverside Canal (Phase 4a Project). These canals have been designed to minimize the intensity and frequency of maintenance activities, thus reducing habitat degradation and snake injury and mortality. The habitat quality of the new West Drainage Canal is anticipated to eventually be substantially higher than that of the canal habitat that would be lost. In addition to providing habitat, this canal would provide connectivity between known giant garter snake population centers within the Natomas Basin. Loss and deterioration in the quality of existing travel corridors has been identified as a primary concern in maintaining a genetic connection among the snake populations in the Natomas Basin.

Managed marsh would be created in the Fisherman's Lake Borrow Area as part of the Phase 4a Project to compensate for Phase 4a and 4b Project impacts to giant garter snake habitat, as well as for impacts to giant garter snake habitat from the Phase 2 and 3 Projects. This proposed managed marsh creation, as described in the Phase 4a EIS and EIR, and as summarized in Section 4.7.1.1 above, would also aid in the overall goal of sustaining giant garter snake populations in the Natomas Basin. Creating marsh habitat would not only increase the amount of giant garter snake habitat over what currently exists, but would also help to consolidate and provide connectivity between marsh habitat on TNBC preserve lands managed for giant garter snake in the Fisherman's Lake Area. The approach of converting Fisherman's Lake Borrow Area to managed marsh habitat would be consistent with the NBHCP's goal of sustaining giant garter snake populations in the southern reserve area. Giant garter snakes have been recorded on TNBC lands that were converted from rice to managed marsh, thus demonstrating that giant garter snake would use restored managed marsh habitats. Overall, impacts to giant garter snake related to Phase 4b Project construction activities would be **potentially significant**. ***(Similar)***

Operational Impacts to Giant Garter Snake

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, RD 1000's Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 would require pump upgrades to pump the water from the interior of the Basin out. Intakes would be operated seasonally to pump out agricultural drainage and stormwater from the interior of the basin to the Sacramento River, NEMDC, and PGCC. The interior drainage canals are considered giant garter snake habitat.

Giant garter snakes swimming near intake structures could potentially be trapped by the intake velocities. However, because modifications to the pumps and intakes would not produce a change in the rate and volume of water pumped, an increase in entrapment of aquatic fauna above the existing condition is not expected. In addition, giant garter snakes, which typically swim near the water surface, are likely to avoid entrapment through their strong swimming skills and behavioral avoidance of areas that are routinely disturbed (Hansen pers. comm. 2008; Hansen and Brode 1993). Therefore, because giant garter snakes are likely to avoid the area, operational activities at modified pump stations are not likely to cause disturbance or injury to the snake. Impacts to giant garter snake related to operation of relocated or modified pump stations following project construction are considered **less than significant**. ***(Similar)***

Mitigation Measure 4.7-e: Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Improvements and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, and Obtain Incidental Take Authorization

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on the giant garter snake, the project proponent(s) shall implement the following measures:

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of giant garter snake habitat (e.g., temporary fencing shall be used during construction to protect all aquatic and adjacent upland habitat that is located adjacent to construction areas that can be avoided).

- Additional measures consistent with the goals and objectives of the NBHCP shall be implemented to minimize the potential for direct injury or mortality of individual giant garter snakes during project construction. Such measures shall be finalized in consultation with USFWS and DFG, and are likely to include conducting worker awareness training, timing initial ground disturbance to correspond with the snake's active season (as feasible in combination with project needs and minimizing disturbance of nesting Swainson's hawks), dewatering aquatic habitat before fill, conducting pre-construction surveys, erecting fencing around habitat features that can be avoided to ensure that these remain undisturbed by construction vehicles and personnel, conducting biological monitoring during construction, and removing any temporary fill or construction debris and restoring temporarily disturbed areas to their pre-project conditions according to the USFWS's *Guidelines for the Restoration and/or Replacement of Giant Garter Snake Habitat* (USFWS 1997).

- The project proponent(s) shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that the NLIP's aquatic and upland habitat improvements are created and managed. The project proponent(s) shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components before construction commences. The project proponent(s) shall enter into agreements with the appropriate local entity responsible for long-term management of these created giant garter snake habitats and shall coordinate with USFWS and DFG to ensure that performance criteria and long-term management goals required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance criteria and long-term management goals will be in full compliance with ESA and CESA. The project proponent(s) shall implement all terms and conditions of the management agreements.

- Where borrow sites would result in impacts to giant garter snake habitat over more than one construction season, the work shall progress in cells that will be incrementally developed as habitat or returned to agricultural use as the borrow activities are completed such that no area would be used in consecutive years or such that replacement habitat is available before the loss of existing habitat.

- Authorization for take of giant garter snake under the ESA and CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented.

Responsibility: Project proponent(s)

Timing: Prepare and adopt the MMP and LTMP before construction; implement measures to minimize disturbance to giant garter snake and its habitat before and during construction

Implementing this mitigation measure would reduce construction- and operational-related impacts related to giant garter snake to a **less-than-significant** level because construction would be implemented in a manner that reduces loss of habitat and direct mortality, measures that are part of the NBHCP related to giant garter snake would be implemented, the NLIP's habitat improvements would be implemented in consultation with USFWS and DFG, and take permits would be obtained. ***(Similar)***

Impact 4.7-f: Impacts on Swainson's Hawk and Other Special-Status Birds

Tables 4.7-6 and **4.7-7** summarize impacts to Swainson's hawk foraging and nesting habitat that would occur with project implementation.

Table 4.7-6
Permanent Impacts of the Phase 4b Project on Swainson's Hawk Habitat

Location of Impact	No-Action Alternative (acres)	Adjacent Levee Alternative (Proposed Action) (acres)	Fix-in-Place Alternative (acres)
Grasslands[1] (Sacramento River east levee, PGCC west levee, NEMDC west levee, Morrison Canal, West Drainage Canal Relocation, Chappell Ditch, Pumping Plant Modifications, and NCC/SR 99 Bridge Remediation)	Unknown, but losses of TNBC preserve habitats and other agricultural habitats in the event of flooding could be substantial	171	170
Croplands[2] (Sacramento River east levee, NEMDC west levee, Morrison Canal, Vestal Canal, and West Drainage Canal Relocation)	Unknown, but losses of TNBC preserve habitats and other agricultural habitats in the event of flooding could be substantial	82	81
Woodlands (Sacramento River east levee, American River north levee, NEMDC west levee, West Drainage Canal Relocation, and Pumping Plant Modifications)	0.51 landside 110.26 waterside	35.99 landside 55.22 waterside	34.79 landside 110.73 waterside
Total foraging impacts[1,2]	**Unknown, but potentially substantial**	**253**	**251**
Total nesting impacts[1,2]	**110.77**	**91.21**	**145.52**

Notes: NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; TNBC = The Natomas Basin Conservancy

[1] Up to 60 acres of grassland habitat (not included in this calculation) could be affected at the Lower Dry Creek Woodland Mitigation Planting Area.

[2] Up to 10 acres of cropland (not included in this calculation) may be affected by the woodland planting along Reach A:16 of the Sacramento River.

Source: Construction data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009; data compiled by AECOM in 2010

Table 4.7-7
Permanent Phase 4b Project Impacts on Swainson's Hawk Foraging Habitat

	Affected Cropland (acres)	Created Cropland (acres)	Net Cropland (acres)	Affected Grassland (acres)	Created[1] Grassland (acres)	Net Grassland (acres)	Total Loss (acres)	Total Increase (acres)	Total Net (acres)
Phase 4b Project	-82		**-82**	-171	161	**-10**	253	Up to 578	**Up to 144.45**
NLIP	-829	150	**-679**	-463	1,230	**767**	1,292	1,380	**371.45**

Notes: NLIP = Natomas Levee Improvement Program; NEMDC = Natomas East Main Drainage Canal

[1] Includes NEMDC west levee slopes and seepage berms along the Sacramento River east levee Reach A:16–18B; Reach A:19A–20 not included in estimate of impacts to Swainson's hawk foraging habitat because this area is urbanized and provides lower-quality habitat.

Source: Data compiled by AECOM in 2010

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, there would be no adverse or beneficial impacts on suitable habitat for Swainson's hawk and other special-status birds (listed in **Table 3.7-4**). Even under the No-Action Alternative, however, extensive removal of riparian vegetation on the waterside of the Sacramento River east levee and NEMDC west levee could occur to conform with USACE guidance regarding levee encroachments (see **Table 4.7-2**). The habitat along the waterside of the Sacramento River east levee supports the majority of Swainson's hawk nest sites in the Natomas Basin. Removal of this vegetation would have a substantial impact on Swainson's hawks; therefore, this impact would be **potentially significant**. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding could cause destruction of Swainson's hawk or other special-status bird habitat. The magnitude of the impacts would depend upon the flooding duration, depth, rate, timing, and location. Therefore, a definite determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Potential adverse effects on the Swainson's hawk would include loss of suitable foraging and nesting habitat and disturbance of nesting pairs during project construction. Other special-status birds, including white-tailed kite, northern harrier, and Cooper's hawk, could also be similarly affected (all special-status birds that may be affected are listed in **Table 3.7-4**). The effects on foraging and nesting habitat would result from construction of levee improvements along Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, and the west levees of the PGCC and NEMDC; construction of the relocated West Drainage Canal; borrow activities; and the creation of woodland corridors.

Impacts to Foraging Habitat

As summarized in **Table 4.7-6**, foraging habitat affected by the Adjacent Levee Alternative (Proposed Action) would be primarily croplands and grasslands. The permanent loss of Swainson's hawk foraging habitat within the Phase 4b Project area would be offset by the creation of grasslands foraging habitat. The creation of grasslands would take place primarily on levee slopes of the adjacent levee and seepage berms along Sacramento River east levee Reach A:16–19A and along the widened NEMDC west levee. The Adjacent Levee Alternative (Proposed Action) would result in levee slopes that would be less steep than the existing levee slopes, and along the Sacramento River east levee, several reaches of the levee would have adjoining 100- to 300-foot-wide earthen seepage berms with a nearly flat slope. These areas, with the exception of the crown of the levee and woodland corridors, would be managed as native perennial grassland that would be mowed or grazed with an emphasis on maintaining stubble height to optimize these areas for Swainson's hawk foraging habitat.

As shown in **Table 4.7-7**, the Phase 4b Project would result in a net decrease in foraging habitat for Swainson's hawk, but the overall NLIP results in a net increase in foraging habitat for Swainson's hawk. However, due to conversion of land cover types in the Phase 4b Project footprint, the composition of this foraging habitat would permanently shift from primarily croplands to grasslands, leading to a potential decrease in the quality of foraging habitat for Swainson's hawk. Some foraging habitat would be temporarily affected by the Phase 4b Project borrow activities at the South Fisherman's Lake and Triangle Properties Borrow Areas, and the West Lakeside School Site; however, much of this area would be returned to equivalent foraging habitat following borrow

activities. Grassland would be permanently converted where woodland plantings would occur as compensation for landside woodland impacts, including in Sacramento River east levee Reach A:16 (**Plate 2-7a**) and in the Lower Dry Creek area east of the NEMDC (**Plate 2-14**).

The greatest impact to overall foraging habitat value would be the permanent loss of alfalfa and grass hay, which are considered the highest value foraging habitat types for Swainson's hawks in the Central Valley. The loss of alfalfa, grass hay, and other foraging habitats could result in Swainson's hawks having to forage farther from the nest or increased competition for prey with other hawks in the area. Several studies have documented the importance of hay crops, especially alfalfa for Swainson's hawks (Estep 1989, Estep 2008, and Woodbridge 1998). The characteristics that contribute to high-value habitat include:

- low vegetation structure, which increases prey accessibility;
- relatively large prey populations due to abundant cover and food;
- farming operations, such as weekly irrigation, which increases cover and food for prey; and
- regular mowing, which lowers vegetation structure, disturbs prey, and increases accessibility.

A detailed design of the foraging habitats to be created is being developed by SAFCA, in consultation with USACE, and will be provided for USFWS and DFG review as part of the Phase 4a Project, in advance of Phase 4b Project approval. Protective mechanisms and specific management protocols for Swainson's hawk foraging habitat that would be created in the Fisherman's Lake Borrow Area are currently being prepared by SAFCA, in consultation with USACE, in coordination with these agencies. If habitat creation/preservation and management are not effectively implemented to provide foraging habitat for the Swainson's hawk or other special-status bird species listed in **Table 3.7-4**, an overall adverse effect could occur. This impact would be **potentially significant**.

Impacts to Nesting Habitat

An estimated 600 acres of riparian and non-riparian woodland habitat are present on the landside of the Natomas Basin, and approximately 420 acres of riparian woodland habitat are present along the waterside of the Sacramento River east levee and American River north levee, totaling approximately 1,020 acres. The vast majority of Swainson's hawk nests in the Basin is within the mature riparian forest/woodlands along the waterside of the Sacramento River east levee. The design of the adjacent levee along the Sacramento River east levee avoids almost entirely the need to remove waterside riparian forest/woodlands, which would otherwise be removed if the levee were being rebuilt and upgraded in place or no action was taken. The woodlands that would be affected are along the landside of the Sacramento River east levee in areas where few nests have been documented since 2001, along the landside and waterside of the American River north levee, and along the waterside of the NEMDC South. Most nests that have been documented on the landside of the Sacramento River east levee are within woodlands in substantial riparian corridors along ditches, sloughs, and canals towards the interior of the Basin.

The Adjacent Levee Alternative (Proposed Action) would affect a moderate amount of primarily landside woodlands; this acreage includes an understory of scrub and grassland components (**Table 4.7-2**). Project impacts include removing landside woodland habitat along Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4, landside woodland habitat where the replacement West Drainage Canal is to be constructed, and landside and waterside woodland associated with levee widening and compliance with vegetation guidance criteria along the NEMDC west levee (see **Table 4.7-2** for acreages). Woodlands are not present along the PGCC west levee improvements within the Phase 4b Project area.

Compensation for adverse impacts on nesting habitat and potential unavoidable loss of active nests resulting from the Adjacent Levee Alternative (Proposed Action) would include creating and preserving woodlands along the landside of the Sacramento River east levee in Reach A:16 and immediately east of the NEMDC along Lower Dry Creek so that no net loss of landside woodlands would occur over the long-term (see **Table 4.7-3**). As shown in **Table 4.7-3**, the NLIP's programmatic conservation strategy for creation and preservation of landside woodlands would result in an overall net increase in woodland acreage in the Natomas Basin.

The woodland mitigation plan includes transplanting suitable trees from the project footprint, where feasible, as well as planting a variety of native tree species that could become potential nesting habitat for Swainson's hawk or other special status birds listed in **Table 3.7-4**. To provide adequate compensation for lost habitat, the woodlands must be created and/or managed in a manner that provides the essential habitat functions for special-status bird species. A detailed design of the woodland habitats to be created is being developed and provided for USFWS and DFG review; protective mechanisms and specific management protocols for the woodlands are currently being prepared by SAFCA, in consultation with USACE, in coordination with these agencies (as described in Section 2.3.4, "Habitat Improvements").

However, if habitat creation/preservation is not effectively implemented to provide nesting habitat for Swainson's hawk or other special-status bird species (listed in **Table 3.7-4**), an overall adverse effect could occur. Should habitat creation/preservation be implemented effectively, there would be a temporal (minimum10–15 years) loss of woodlands, with the exception of Heritage oaks, providing potential nesting habitat for Swainson's hawk and other special-status birds. These impacts would be **potentially significant**.

Impacts to Nesting Behavior

Project construction would occur during the Swainson's hawk nesting season and could disrupt nesting behavior. If project construction is already under way when pairs return to their nesting territories, project activity could render previously occupied territories unsuitable. If active nests are present near construction areas when construction begins, the nesting pairs could be disturbed, potentially resulting in nest abandonment and loss of eggs or young. Various conservation measures would be implemented to avoid and minimize take of Swainson's hawks. These measures include conducting surveys for and monitoring of Swainson's hawk nests and the nests of other special status birds identified in **Table 3.7-4** before and during construction to identify active nests in the vicinity of project activities, and establishing and maintaining buffers around the nests, in coordination with DFG, so that project construction activities do not result in detectable adverse effects on active nests. This impact would be **potentially significant**.

Impacts Related to Power Pole Relocations

The Phase 4b Project includes relocating or replacing Pacific Gas & Electric Company (PG&E) and Sacramento Municipal Utility District (SMUD) power poles. Power poles may benefit raptors by providing perching and/or nesting structures (or both) in areas where few natural perches or nest sites exist. However, these structures can also pose a threat to raptors and other birds through electrocutions or collisions. Mortality is most common with birds with large wing spans, such as eagles or cranes. Electrocution can occur when a bird simultaneously touches two energized parts or an energized part and a grounded part of the electrical equipment. PG&E has developed and implemented an Avian Protection Plan (APP) to better protect birds and improve safety and reliability for its customers. The APP, which has been in place since 2002, includes outfitting all new poles and replacement poles in bird-sensitive locations with bird-safe equipment. PG&E is also a founding member of the Avian Power Line Interaction Committee (APLIC), a collaboration between utilities and USFWS that began nearly 20 years ago. The APLIC has guidelines and industry standards to avoid bird collisions and electrocutions.

The Adjacent Levee Alternative (Proposed Action) would not increase power pole-related hazards for the Swainson's hawk and other birds. While the project proponent(s) has no direct control over the specific design and retrofitting of the relocated and replaced power poles, it can be expected that PG&E will implement its APP and follow the APLIC guidelines and industry standards to reduce electrocution of birds perching on the power poles and power lines. The Adjacent Levee Alternative (Proposed Action) would have **no impact** on Swainson's hawks and other birds as a result of power pole relocations.

Fix-in-Place Alternative

Under the Fix-in-Place Alternative, potential effects on Swainson's hawk and other special-status bird species identified in **Table 3.7-4** associated with the Sacramento River east levee improvements would be somewhat different from those under the Adjacent Levee Alternative (Proposed Action). Compared to the Adjacent Levee Alternative (Proposed Action), loss of nesting habitat on the landside of the levee would be reduced under the Fix-in-Place Alternative (see **Table 4.7-2** for acreage). However, a substantially greater number of acres of riparian woodland acres on the waterside of these levee reaches that provide suitable nesting habitat for Swainson's hawk would likely need to be removed to conform with USACE guidance regarding levee encroachments (**Table 4.7-2**). Potential adverse impacts from such vegetation removal are likely to be greater than those under the Adjacent Levee Alternative (Proposed Action), in terms of both the amount and quality of that habitat. The foraging habitat affected by this alternative would be cropland replaced by grasslands along levee and berms resulting in a nearly equal amount of foraging habitat, but a conversion of higher-quality croplands to grasslands that provide lesser-quality habitat.

Similar to the Adjacent Levee Alternative (Proposed Action), the impacts on nesting habitat and potential unavoidable loss of active nests associated with the removal of landside woodlands would be compensated by the proposed creation of landside woodland habitat in Sacramento River east levee Reach A:16 and along Lower Dry Creek. However, it is uncertain whether the new woodlands would be adequate to compensate for the potential extensive loss of Swainson's hawk nest sites on the waterside of the Sacramento River east levee Reach A:16–20 and NEMDC west levee. The Fix-in-Place Alternative would also require relocation and replacement of some power poles. As with the Adjacent Levee Alternative (Proposed Action), this alternative would not increase power pole-related hazards for the Swainson's hawk and other birds because it can be expected that PG&E would implement its APP and follow the APLIC guidelines and industry standards to reduce electrocution of birds perching on the power poles and power lines.

Overall, as with the Adjacent Levee Alternative (Proposed Action), if habitat creation/preservation is not effectively implemented to provide foraging and nesting habitat for Swainson's hawk or other special-status bird species, an overall adverse effect could occur. This impact would be **potentially significant**. ***(Greater)***

Mitigation Measure 4.7-f: Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Implement All Upland and Agricultural Habitat Improvements and Management Agreements to Compensate for Loss of Quantity and Quality of Foraging Habitat, Obtain Incidental Take Authorization; and Implement Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat, Implement all Woodland Habitat Improvements and Management Agreements, Compensate for Loss of Habitat, and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) and its primary contractors for engineering design and construction shall ensure that the following measures are implemented to avoid, minimize, and compensate for potential project effects on Swainson's hawks and other special-status birds:

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of potential nesting habitat for special-status birds through the following activities:
  - The biologist shall conduct pre-construction surveys to identify active special-status bird nests near construction areas.

- Surveys for nesting birds shall be conducted before project activities are initiated during the nesting season (March 1–September 15). Surveys shall be conducted in accordance with standardized protocols and NBHCP requirements.

- Removal of potential nesting habitat shall be conducted during the non-nesting season, to the extent feasible and practicable, to minimize the potential for loss of active nests.

- If an active nest is found, the biologist shall determine an appropriate buffer that minimizes potential for disturbance of the nest, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted during construction and by a qualified biologist to ensure that project activity does not result in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that staging areas and access routes are designed to minimize disturbance of known Swainson's hawk nesting territories through the following activities:

  - The biologist shall conduct pre-construction surveys to identify active nests within 0.50 mile of construction areas, in accordance with DFG guidelines. Surveys shall be conducted in accordance with NBHCP requirements and *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000).

  - If an active nest is found, an appropriate buffer that minimizes the potential for nest disturbance shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted during construction and by a qualified biologist to determine whether project activity results in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

- The project proponent(s) shall coordinate with USFWS and DFG to ensure that the NLIP's woodland, upland, and agricultural habitat improvements are created and managed. SAFCA, in consultation with USACE, shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components before construction commences. SAFCA, in consultation with USACE, shall enter into agreements with the appropriate local entity responsible for long-term management of these created Swainson's hawk habitats and shall coordinate with USFWS and DFG to ensure that performance criteria and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance criteria and

long-term management goals will be in full compliance with ESA and CESA. SAFCA, in consultation with USACE, shall implement all terms and conditions of the management agreements.

- The criteria for measuring performance shall be used to determine if the habitat improvement is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. Performance criteria for managed grasslands shall be developed by SAFCA in consultation with USACE, USFWS, NMFS, and DFG, and shall include, but not be limited to:

  - percent cover of invasive species (<1%),
  - percent cover of nonnative herbaceous plants (<10–25%), and
  - percent absolute cover of native species (>50–80%).

- Authorization for take of Swainson's hawk under CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented.

In addition to the above measures, the project proponent(s) shall implement Mitigation Measure 4.7-a, above.

Responsibility:	Project proponent(s)
Timing:	Before construction

Implementation of this mitigation measure, as well as Mitigation Measure 4.7-a, would minimize adverse effects of the Adjacent Levee Alternative (Proposed Action) on Swainson's hawk. This measure coupled with the amount of landside woodlands that would be created and preserved as part of the Phase 2, 3, and 4a Projects would result in a net increase in potential nesting habitat (landside woodlands). The creation and preservation of nesting and foraging habitat in the Basin would reduce long-term and overall impacts to Swainson's hawk to a **less-than-significant** level. Although no permanent impacts would occur, this impact would remain **significant and unavoidable** for many years before reaching a less-than-significant level because replacement plantings, with the exception of replacement of Heritage oaks, would likely require a minimum of 10–15 years before providing important habitat components such as structure and shade. Replacement oak plantings would remain **significant and unavoidable** because it would take approximately 100 years to reach Heritage status.

Implementation of this mitigation measure, as well as Mitigation Measure 4.7-a, would minimize long-term, adverse effects of the Fix-in-Place Alternative on Swainson's hawk, but would not fully reduce waterside vegetation loss to a less-than-significant level. While the woodland mitigation proposed for the Fix-in-Place Alternative would mitigate for landside nesting habitat impacts, the proposed mitigation would not be adequate to compensate for the extensive loss of mature waterside vegetation; therefore, this impact would remain **significant and unavoidable**. ***(Greater)***

Impact 4.7-g: Potential Loss and/or Direct Impact of Elderberry Shrubs and/or Potential Loss of Valley Elderberry Longhorn Beetle

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for direct disturbance on valley elderberry longhorn beetle or elderberry shrubs due to project construction activities. However, there could be extensive removal of elderberry shrubs on the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments, even without project implementation. This potential impact would be **potentially significant**. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding of the Basin might result in beneficial or adverse conditions for elderberry shrubs and, consequently, valley elderberry longhorn beetle, in some locations. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether adverse or beneficial, is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Approximately seven elderberry shrubs are known to be present within or adjacent to the Phase 4b Project footprint along the landside of the Sacramento River east levee Reach A:16–20, and two shrubs are present within or adjacent to the proposed landside footprint of American River north levee Reach I:1–4. Because elderberry surveys have not been conducted on the waterside of Sacramento River east levee Reach A:16–20, the American River north levee, or the NEMDC west levee, the number of waterside elderberry shrubs is unknown. The loss and/or direct impact of elderberry shrubs and potential loss of beetles under the Adjacent Levee Alternative (Proposed Action) would be offset by SAFCA's plan to incorporate plantings of elderberry shrubs and other appropriate native species into the woodland corridors and other potential woodland restoration areas. Elderberry shrubs would be planted in numbers adequate to compensate for elderberry shrub loss, based on standard USFWS mitigation guidelines. A detailed plan for woodland creation is being developed by SAFCA, in consultation with USACE, and will be provided to USFWS and DFG for review; and protective mechanisms and specific management protocols are currently being prepared by SAFCA in coordination with these agencies, including USACE. Portions of the woodland areas must be created and managed in a manner that provides the essential functions of valley elderberry longhorn beetle habitat that would be lost through project activities in order for them to provide adequate compensation. However, if habitat creation and management are not effectively implemented to provide replacement habitat for the valley elderberry longhorn beetle, an overall adverse effect could occur. This impact would be **potentially significant**.

Fix-in-Place Alternative

Under the Fix-in-Place Alternative, potential impacts on valley elderberry longhorn beetle would be somewhat different from those under the Adjacent Levee Alternative (Proposed Action). Loss of elderberry shrubs on the landside of the Sacramento River east levee may be reduced under this alternative by the lack of an adjacent levee, but a substantial amount of riparian woodland that supports an unknown number of elderberry shrubs on the waterside of the levee may require removal to conform with USACE guidance regarding levee encroachments (**Table 4.7-2**). Per the USFWS's conservation guidelines for this species (USFWS 1999), all of these shrubs would be transplanted during the dormant season into woodland corridors. Potential adverse impacts from such

vegetation removal could be greater than those within the adjacent levee footprint on the landside of the levee under the Adjacent Levee Alternative (Proposed Action), particularly in terms of the quality of habitat that is affected. Similar to the Adjacent Levee Alternative (Proposed Action), the loss of elderberry shrubs and potential loss of beetles under the Fix-in-Place Alternative would be offset by SAFCA's plan to incorporate plantings of elderberry shrubs and other appropriate native species into the woodland corridors and other potential woodland restoration areas. However, as with the Adjacent Levee Alternative (Proposed Action), overall adverse effects could occur if the replacement habitat does not provide the essential components and is not managed in a way that maximizes habitat quality and minimizes potential adverse effects on valley elderberry longhorn beetle. This impact would be **potentially significant**. ***(Greater)***

Mitigation Measure 4.7-g: Conduct Focused Surveys for Elderberry Shrubs as Needed, Implement All Woodland Habitat Improvements and All Management Agreements, Ensure Adequate Compensation for Loss of Shrubs, and Obtain Incidental Take Authorization

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on valley elderberry longhorn beetle, the project proponent(s) shall implement the following measures:

- A qualified biologist retained by the project proponent(s) shall conduct focused surveys of elderberry shrubs within 100 feet of the project footprint, in accordance with USFWS guidelines. All elderberry shrubs with potential to be affected by project activities shall be mapped, the number of stems greater than 1 inch in diameter on each shrub that requires removal shall be counted, and these stems shall be searched for beetle exit holes.

- The primary engineering and construction contractors shall ensure, through coordination with the biologist, that construction is implemented in a manner that minimizes disturbance of areas that support elderberry shrubs (e.g., temporary fencing shall be used during construction to protect all elderberry shrubs that are located adjacent to construction areas but can be avoided). Shrubs that require removal shall be transplanted to the woodland creation areas, if feasible, when the plants are dormant (November through the first 2 weeks of February) to increase the success of transplanting. If none of the areas of suitable habitat to be created as part of the project would be available before the impact would occur, alternative transplantation locations (e.g., other SAFCA mitigation areas or TNBC preserves) shall be identified and shall be approved by USFWS.

- The number of replacement elderberry plantings shall be determined based on USFWS guidelines, which require replacement ratios ranging from 1:1 to 8:1 for lost stems at least 1 inch in diameter, depending on the size of the affected stems and presence or absence of beetle exit holes. Associated native species shall be planted at ratios ranging from 1:1 to 2:1 for each elderberry planting.

- The project proponent(s) shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that the NLIP's woodland habitat improvements are created and managed. The project proponent(s) shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components before construction commences. The project proponent(s) shall enter into agreements with the appropriate local entity responsible for long-term management of these created woodland habitats and shall coordinate with USFWS and DFG to ensure that performance criteria and long-term management goals that are required by regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance criteria and long-term management goals will be in full compliance with the ESA and CESA. The project proponent(s) shall implement all terms and conditions of the management agreements.

USACE shall initiate consultation activities with USFWS under Section 7 of the ESA, and authorization for take of valley elderberry longhorn beetle under the ESA shall be obtained if it is determined, in consultation with USFWS, that shrub removal is likely to result in such take. All measures subsequently developed through the Section 7 consultation process shall be implemented by the project proponent(s).

Responsibility: Project proponent(s)

Timing: Before construction

Implementing this mitigation measure would reduce the impact on valley elderberry longhorn beetle to a **less-than-significant** level because protocol-level surveys would be conducted, construction activities would avoid elderberry shrubs to the maximum extent feasible, elderberry shrub replacement would occur in consultation with USFWS, habitat improvements would be implemented, and USACE would consult with USFWS under Section 7 of the ESA. ***(Similar)***

Impact 4.7-h: Impacts on Northwestern Pond Turtle and Burrowing Owl

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for direct disturbance of northwestern pond turtle or burrowing owl habitat. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Floodwaters could inundate habitat areas and result in direct mortality of northwestern pond turtles. Burrowing owls could also be adversely affected by winter flooding as a result of either direct mortality or inundation and destruction of burrows. The magnitude of these impacts would depend upon the flooding duration, depth, rate, timing, and location. Therefore, a precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Adverse effects on suitable northwestern pond turtle habitat in the Phase 4b Project area would include the permanent loss (see **Table 4.7-5** for acreage) of a small amount of relatively unvegetated irrigation/drainage canals within the proposed construction footprint of the Sacramento River east levee, NCC south, PGCC west levee, and NEMDC west levee. Construction of the realigned West Drainage Canal would result in the temporary loss of suitable turtle habitat. Development of the South Fisherman's Lake and Triangle Properties Borrow Areas would potentially temporarily convert potential northwestern pond turtle habitat (e.g., irrigation and drainage ditches) to non-usable habitat. As described in Section 2.3.3, "Borrow Sites," in selecting borrow sites, consideration would be given to ensure that activities result in minimal adverse impacts to the environment.

Habitat losses for northwestern pond turtle would be offset by the proposed habitat creation components of the Adjacent Levee Alternative (Proposed Action), including creation of managed marsh habitat in the Fisherman's Lake Borrow Area, as described in the Phase 4a EIS and EIR, and creation of managed marsh habitat at Brookfield. Northwestern pond turtles would also benefit from the creation of canal habitat for giant garter snake

implemented as part of the NLIP programmatic conservation strategy. There is potential for direct loss of pond turtles, however, if they are present within the affected habitats.

Project construction and implementation could result in the destruction of burrows occupied by burrowing owls should they occur within the adjacent levee footprint of the Sacramento River east levee; along the existing or West Drainage Canal; along the NCC, PGCC, or NEMDC; or within active borrow areas within the Phase 4b Project area. Burrowing owls are known to occur along the NEMDC South, west of East Levee Road. There is potential for direct loss of burrowing owls to occur if they are present within the affected habitats.

The direct loss of northwestern pond turtles and the potential for destruction of burrows occupied by burrowing owls would be a **potentially significant** impact. ***(Similar)***

Mitigation Measure 4.7-h: Conduct Focused Surveys for Northwestern Pond Turtles and Burrowing Owls, Relocate Northwestern Pond Turtles as Needed, Minimize Potential Impacts on Burrowing Owls, and Relocate Burrowing Owls as Needed

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on northwestern pond turtle and burrowing owl, the project proponent(s) shall implement the following measures:

- A qualified biologist retained by the project proponent(s) shall conduct surveys for northwestern pond turtle in aquatic habitats to be dewatered and/or filled during project construction. Surveys shall be conducted immediately after dewatering and before fill of aquatic habitat suitable for pond turtles. If pond turtles are found, the biologist shall capture them and move them to nearby areas of suitable habitat that would not be disturbed by the project.

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of potential nesting habitat for burrowing owls (e.g., removal of potential nesting habitat shall be conducted during the non-nesting season, to the extent feasible and practicable, to minimize the potential for loss of active nests).

- The biologist shall conduct pre-construction surveys to identify occupied burrowing owl burrows in the vicinity of construction areas. Surveys for burrowing owl shall be conducted before project activities are initiated at any time of year. Surveys shall be conducted in accordance with standardized protocols, including DFG's *Staff Report on Burrowing Owl Mitigation* (DFG 1995), and NBHCP requirements. If an occupied nest burrow is found, an appropriate buffer that minimizes potential for disturbance of the nest shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted by a qualified biologist to ensure that project activity does not result in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

- If an occupied burrowing owl burrow that does not support an active nest is found, the project proponent(s) shall develop and implement a relocation plan, in coordination with and subject to approval of DFG and USFWS, and consistent with requirements of the NBHCP, DFG's *Staff Report on Burrowing Owl Mitigation* (DFG 1995) and the Airport

Wildlife Hazard Management Plan (WHMP). Relocation is anticipated to occur through passive exclusion of owls from the project site (using one-way doors at the burrow entrances). The owls would then be able to reoccupy the area after construction is complete. Because the project would generally result in temporary disturbance of burrowing owl habitat and conversion from one suitable habitat type to another, no mitigation for temporary burrow or habitat loss would be required.

Responsibility:	Project proponent(s)
Timing:	Before construction

Implementing this mitigation measure would reduce the potential impact to a **less-than-significant** level for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because northwestern pond turtles would be physically relocated (if present) and construction would be implemented in a manner that reduces loss of nesting habitat and direct mortality of burrowing owls (if present). ***(Similar)***

Impact 4.7-i: Disturbance to Special-Status Vernal Pool Crustaceans

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, there would be no Phase 4b Project improvements to the Natomas perimeter levee system Therefore, there would be **no impact** on special-status vernal pool crustaceans and their habitats. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could destroy special-status crustaceans and their habitats, depending on timing, location, and duration of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether beneficial or adverse is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Vernal pools within the Phase 4b Project area could support two Federally listed vernal pool crustaceans (vernal pool fairy shrimp and vernal pool tadpole shrimp) along the toe of the existing landside NEMDC west levee, and within the Triangle Properties Borrow Area and the Lower Dry Creek woodland mitigation planting area. Vernal pools that remain inundated for an adequate period (18 days for vernal pool fairy shrimp and 41 days for vernal pool tadpole shrimp) have the potential to support vernal pool crustaceans. Both vernal pool fairy shrimp and vernal pool tadpole shrimp have historic documented occurrences along the NEMDC and recent documented occurrences east of the Natomas Basin within 2 miles of the Phase 4b Project area. However, it is unlikely that the vernal pools along the landside of the NEMDC support vernal pool crustaceans because of the shallow nature of the depressions and the high percentage of nonnative annual grasses that have colonized these depressions. Additionally, the eastern portion of the Natomas Basin is largely developed for agricultural purposes. The scarcity of the vernal pools along the NEMDC and the lack of suitable habitat surrounding the Phase 4b Project area decrease the probability that viable populations of vernal pool fairy shrimp and vernal pool tadpole shrimp would be found along the landside of the NEMDC west levee within the Phase 4b Project area. However, the vernal pools within the Triangle Properties Borrow Area and the Lower Dry Creek woodland planting area are part of a vernal pool complex that could provide habitat for vernal pool crustaceans because these areas tend to have a

longer wet phase as a result of the natural undulating topography of these areas and the surrounding undisturbed annual grassland habitat.

California linderiella, while no longer a DFG species of concern, is covered under the NBHCP; this species often co-occurs with vernal pool fairy shrimp. The loss of vernal pool habitat within the Phase 4b Project footprint would result in the conversion of vernal pool habitat along the NEMDC North landside levee toe to annual grassland habitat. This impact is considered **potentially significant**. ***(Greater)***

Mitigation Measure 4.7-i: Survey for Presence or Absence of Vernal Pool Invertebrates, Avoid Disrupting Vernal Pool Habitat, and Implement Measures to Mitigate Loss of Habitat

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce or avoid impacts to special-status vernal pool crustaceans:

- Ground disturbance within 250 feet of seasonal wetland habitat shall be avoided to the extent feasible and practicable. The 250-foot buffers shall be clearly identified by staking or flagging. All project activity shall be prohibited within the buffer areas. If maintenance of these buffers is not feasible, or if changes in drainage associated with project implementation are projected to result in the loss or degradation of seasonal wetlands, additional mitigation shall be required as described below.

- USACE shall initiate Section 7 consultation with USFWS under Section 7 of the ESA, and the project proponent(s) shall consult with DFG under CESA regarding potential construction-related impacts to Federally listed vernal pool crustaceans and state-listed vernal pool crustaceans, respectively. The project proponent(s) shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes to ensure that impacts are avoided and/or minimized.

- If loss or alteration of potential habitat is determined to be unavoidable, appropriate survey measures to determine the presence or absence of vernal pool crustaceans shall be conducted. A complete survey for vernal pool crustaceans consists of sampling for either two full wet season surveys done within a 5-year period, or two consecutive seasons of one full wet season survey and one dry season survey (or one dry season survey and one full wet season survey) (USFWS 1996). Wet season surveys must begin no later than 2 weeks after the initial inundation of seasonal wetland habitat, and must be adequately sampled once every 2 weeks until the habitat is no longer inundated, or until the habitat has experienced 120 days of continuous inundation. Dry season surveys require the collection of 10 soil samples after pools have dried. Surveys need to be conducted by a qualified biologist holding the required permits.

- If no endangered vernal pool crustaceans are found, a letter report documenting survey methods and findings shall be submitted to USFWS, and no further mitigation is necessary. Should the presence of either vernal pool tadpole shrimp or vernal pool fairy shrimp be confirmed, consultation with USFWS will be required, and an incidental take permit may be required. During this consultation, an appropriate and feasible mitigation plan shall be developed and provided to USFWS for approval. The plan shall include, but would not necessarily be limited to, the preservation and creation of habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp.

- Alternatively, if loss or alteration of potential habitat is determined to be unavoidable, the project proponent(s) may elect to assume presence in the vernal pools rather than sampling for special-status vernal pool crustaceans and mitigate for loss of the species at

a USFWS approved mitigation bank at a minimum ratio of 2:1. The mitigation ratio that is ultimately required will be determined by USFWS through the Section 7 ESA process.

- Vernal pool complexes on the Triangle Properties Borrow Area shall not be used for borrow material.

Responsibility:	Project proponent(s)
Timing:	Before construction

Implementation of Mitigation Measure 4.7-i would reduce this impact to vernal pools outside of the project footprint to a **less-than-significant** level for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because of the avoidance buffers that would be placed around vernal pools outside of the widened levee footprint along the west levee of NEMDC North, and the commitment to provide vernal pool habitat for special-status vernal pool crustaceans at ratios approved by USFWS and at a USFWS-approved mitigation bank. ***(Similar)***

Impact 4.7-j: Temporary Construction-Related Impacts to Fish and Aquatic Habitats

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project improvements would occur and there would be no potential for construction-related increases in sedimentation, turbidity, or contaminants, or direct disturbance to fish and aquatic habitats. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could introduce sediments and contaminants into stream channels, irrigation and drainage canals, and the Sacramento and American Rivers, potentially resulting in the loss of fish or aquatic habitat. Because the extent and location of a levee failure and subsequent flooding is unknown, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Water Quality Impacts: Turbidity, Sedimentation, and Contaminants

Fish population levels and survival have been linked to levels of turbidity and siltation in a watershed. Prolonged exposure to high levels of suspended sediment could create a loss of visual capability in fish, leading to a reduction in feeding and growth rates; a thickening of the gill epithelia, potentially causing the decrease of respiratory function; clogging and abrasion of gill filaments; and increases in stress levels, reducing the tolerance of fish to disease and toxicants (Waters 1995). Additionally, high levels of suspended sediments could cause the movement and redistribution of fish populations. Many fish are sight feeders, and turbid waters could reduce the ability of these fish to locate and feed on prey. Some fish, particularly juveniles, could become disoriented and leave areas where their main food sources are located, ultimately reducing their growth rates. Avoidance is the most common result of increases in turbidity and sedimentation. Fish will not occupy areas unsuitable for survival unless they have no other option.

Contaminants such as bentonite slurry, fuels, oils, and other petroleum products used in construction activities may be toxic to fish or may alter oxygen diffusion rates and can cause acute and/or chronic toxicity to aquatic organisms, thereby reducing growth and/or survival. Substances contributing to sedimentation, turbidity, or contamination can enter waterways directly during construction activities or through surface runoff.

The waterways potentially affected by construction of the Phase 4b Project (Sacramento River, NCC, PGCC, and NEMDC) provide, or are hydrologically connected to, waterways that provide habitat for special-status adult and juvenile Chinook salmon (all races), Central Valley steelhead, and green sturgeon, as well as for striped bass and American shad. Project construction activities could result in loss of fish and aquatic habitat through temporary increases in sedimentation and turbidity or the release of contaminants into waterways from improvements to the perimeter levees. Specifically, impacts to water quality that could affect fish and aquatic habitat include:

- extensive soil borrow excavation and placement for all levee improvements; clearing, grubbing/stripping, degrading, and construction of cutoff walls; and finish grading under the Adjacent Levee Alternative (Proposed Action);
- construction of the adjacent levee along Sacramento River east levee Reach A:16–20;
- slope flattening of the American River north levee Reach I:1–4;
- levee widening and slope flattening of NEMDC North and raising from Elkhorn Boulevard to approximately 1 mile upstream of Elverta;
- raising of a 500-foot-long section of the NEMDC extending downstream from Elkhorn Boulevard, and raising the west levee of the PGCC;
- dewatering and cofferdam installation associated with the erosion repair project elements, including the construction of a beaver wall along the PGCC west levee from SR 99 to Howsley Road, reconstruction of the low-flow channel in NEMDC South located downstream of City of Sacramento Sump Pump 157, and placement of a rock berm between Sump Pump 157 and the reconstructed low-flow channel;
- rock slope protection that would be installed along the PGCC west levee at the confluence with Curry Creek, Pleasant Grove Creek, at the Howsley Road Bridge west abutment, and at the Pierce-Roberts Drain; and
- rock slope protection that would be installed along the NEMDC west levee at the confluence with Dry Creek and Arcade Creek.

These activities could impair water quality for fish if soils or contaminants enter waterways directly or through surface runoff and hydrologic connection. Modifications to pumping plants and/or their pipelines could result in loss of fish and aquatic habitat through temporary increases in sedimentation and turbidity or the release of contaminants into waterways. These impacts could result from:

- raising and replacing discharge pipes and installing valves constructed on the waterside levee shoulder at RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8; and City Sump Pumps 160, 102, and 58;
- constructing new outfalls and related dewatering at RD 1000 Pumping Plant Nos. 6 and 8, and City Sump Pumps 160, 102, and 58; and potentially modifying the landside intake channel at RD 1000 Pumping Plant Nos. 6 and 8;
- regrading of the waterside slope at RD 1000 Pumping Plant No. 8, and removing the waterside cutoff structure at City Sump Pump 58; and
- potentially relocating City Sump Pump 102 outside of the modified levee footprint.

The PGCC does not provide habitat for, nor is it known to support, special-status fish species. However, temporary increases in sedimentation and turbidity or the release of contaminants into the PGCC could result in impaired water quality in the NEMDC, a watercourse that is known to support special-status fish.

Other elements of the Adjacent Levee Alternative (Proposed Action), including the relocation and construction of the West Drainage Canal, private irrigation and drainage ditch relocation, road reconstruction, and private well and utility relocation, could impair water quality for fish if soils or contaminants enter waterways directly or through surface runoff. The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would have similar impacts on fish and aquatic habitat resulting from the waterside removal of woody vegetation along the NEMDC South west levee. The removal of SRA is addressed above under Impact and Mitigation Measure 4.7-a. However, under the Fix-in-Place Alternative, waterside removal of large woody vegetation would also occur along the Sacramento River east levee to comply with USACE levee guidance that requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes (USACE 2000), resulting in a greater loss of SRA.

Disturbance to Fish and Aquatic Habitats

In-water work that could cause direct disturbance or injury to fish and aquatic habitats would include the following:

- dewatering areas that require erosion control and placement of riprap on the channel bank or within the channel bed for erosion control using a barge or excavator could cause disturbance to fish and aquatic habitats;
- dewatering a portion of the NCC at the SR 99 Bridge to install underseepage remediation;
- potential dredging to accommodate modifications to the intake channels associated with RD 1000's Pumping Plant Nos. 6 and 8 that could result in habitat disturbance and direct effects to fish and other aquatic organisms; and
- pile driving/vibratory hammer use from construction of the cofferdam for the outfall construction at RD 1000's Pumping Plant Nos. 6 and 8, and City Sump Pumps 160, 102, and 58; and the potential removal of culverts under the PGCC east and west levees that could result in sound pressure effects to fish.

The construction of a sheetpile cofferdam and dewatering at the RD 1000's Pumping Plant Nos. 6 and 8 and City Sump Pumps 160, 102, and 58 outfall installation site; potentially removing culverts under the PGCC; and erosion site repairs along the PGCC and NEMDC could result in underwater sound pressure effects and fish stranding if fish are present in the immediate work area during construction activities. All in-water work would be conducted during periods when sensitive fish species are least likely to be present, and a fish rescue plan would be implemented to minimize the potential for stranding of individual fish in the relatively small area within the cofferdam. Available information indicates that exposure of fish species to underwater sound pressure levels exceeding approximately 180 decibels (dB) may result in sublethal (e.g., damage to ear, hearing impairments, behavioral implications including delays in migration) or lethal (e.g., ruptured swim bladder, internal bleeding) effects (Laughlin 2005). These critical sound levels exceed levels that are anticipated to be associated with project-related construction activities, as pile-driving activities with repetitive high peaks have been documented to generate up to about 115 dB at a distance of 10 feet. Therefore, this activity is expected to be well below critical sound pressure levels for fish mortality or injury, and avoidance of the construction area would be the anticipated behavioral response.

Individual fish, if present in the immediate work area during any of the above construction activities, could be injured by equipment used for these activities or the sound pressure generated by them. Behavioral avoidance of adverse habitat conditions by fish is anticipated to be the most common result of increases in disturbance. Fish and other aquatic organisms displaced from their habitat due to the application of riprap, placement of support

piles, localized dredging, cofferdam construction and dewatering, or general in-water construction activities could become vulnerable to predators or other unfavorable habitat conditions. Construction-related habitat disturbance could result in temporarily adverse affects to the aquatic food web and fish populations including listed species within the Phase 4b Project area boundaries.

Impact Summary

Potential sedimentation, increased turbidity, or the release and exposure of contaminants could adversely affect fish and aquatic habitats. Construction activities including rip rap placement, potential channel modifications, pile driving, cofferdam construction and dewatering, and general in-water construction could cause direct disturbance to fish and their aquatic habitats. Out-of-water construction activities could also occur at times of the year when there is potential for the presence of sensitive fish species/life stages in the Sacramento River, NCC, PGCC, or NEMDC during construction activities. For the above reasons, this impact would be **potentially significant *(Similar)*** for the Adjacent Levee Alternative (Proposed Action). For the Fix-in-Place Alternative, the extent of waterside vegetation removal along the Sacramento River east levee Reach A:16–20 would be greater than the Adjacent Levee Alternative (Proposed Action). The removal of SRA is addressed in Impact 4.7-a, above. The resulting potential for sediments to enter the Sacramento River under the Fix-in-Place Alternative is greater than the Adjacent Levee Alternative (Proposed Action). The impact would also be **potentially significant**. ***(Greater)***

Mitigation Measure 4.7-j: Implement Mitigation Measure 4.6-a, "Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, Prepare and Implement a Spill Containment Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions;" Implement a Feasible Construction Work Window that Minimizes Impacts to Special-Status Fish Species for Any In-Water Activities; and Implement Operational Controls and a Fish Rescue Plan that Minimizes Impacts to Fish Associated with Cofferdam Construction and Dewatering

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce impacts to fish and aquatic habitats related to temporary and short-term construction-related increases in sediments and turbidity and release of contaminants, as well as direct disturbance, to a less-than-significant level. These measures shall be included in construction specifications along with any additional measures identified in necessary permits.

- The project proponent(s) shall implement Mitigation Measure 4.6-a, as described in Section 4.6, "Water Quality." This measure requires filing a Notice of Intent (NOI) with the Central Valley RWQCB; implementing standard erosion and siltation measures and best management practices (BMPs); preparing and implementing a storm water pollution prevention plan (SWPPP); preparing and implementing a spill containment plan; and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity.

- The project proponent(s) shall identify and implement feasible in-water construction work windows in consultation with NMFS and DFG. In-water work windows shall be timed to occur when sensitive fish species/life stages are not present or least susceptible to disturbance (e.g., July 1–October 1). This measure would reduce potential construction-related direct impacts to special-status fish from dredging and/or construction of the cofferdam and dewatering, general in-water construction, and/or the placement of rock riprap because all in-water work would occur during the period of time that sensitive special-status fish (or life stages) would be least likely to be present in the construction area.

- USACE shall initiate Section 7 consultation with NMFS under Section 7 of the ESA, and the project proponent(s) shall consult with DFG under CESA regarding potential construction-related impacts to Federally listed fish species and state-listed fish species, respectively. The project proponent(s) shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes, including Section 2081 permit conditions, to ensure that impacts are avoided and/or minimized.

- The cofferdam sheetpiles at the outfall structure construction sites shall be installed using a vibratory hammer when possible to minimize underwater sound pressure levels to the greatest extent feasible and associated effects to sensitive fish species. Vibratory hammers/pile drivers shall only be used during daytime hours and shall commence at low-energy levels and slowly build to impact force. If it is determined that a higher-intensity percussion hammer or pile driver would be required for installing the cofferdam or pilings, avoidance of potential adverse effects would be achieved by consulting with NMFS, USFWS, and DFG to determine the appropriate actions, which may include surveying the outfall site to determine fish presence prior to installation, and possibly modifying the work window accordingly.

- To reduce the potential for fish stranding or minimize the potential for harm during cofferdam dewatering activities, the project proponent(s) or its contractor shall implement a fish rescue plan. Prior to the closure of the cofferdam in the Sacramento River, seining by a qualified fisheries biologist (with a current DFG collection permit) will be conducted within the cofferdam using a small-mesh seine to direct and move fish out of the cofferdam area. Upon completion of seining, the entrance to the cofferdam will be blocked with a net to prevent fish from entering the cofferdam isolation area before the cofferdam is completed. Once the cofferdam is completed and the area within the cofferdam is closed and isolated, additional seining will be conducted within the cofferdam to remove any remaining fish. Once most of the fish have been removed from the isolated area, portable pumps with intakes equipped with 1.75 mm mesh screen shall be used to dewater to a depth of 1.5–2 feet. A qualified biologist shall implement further fish rescue operations using electrofishing and dip nets. All fish that are captured will be placed in clean 5-gallon buckets and/or coolers filled with Sacramento River, NCC, PGCC, or NEMDC water (depending on the location of the construction activity), transported downstream of the construction area, and released back into suitable habitat in the Sacramento River, NCC, PGCC, or NEMDC (depending on the location of the construction activity) with minimal handling. After all fish have been removed using multiple seine passes, electrofishing, and dip nets (as necessary), portable pumps with screens (see above) will be used for final dewatering. NMFS, USFWS, and DFG shall be notified at least 48 hours prior to the fish rescue.

Responsibility: Project proponent(s)

Timing: Before construction

Implementing this mitigation measure would reduce the potential impacts of increased sedimentation, turbidity, and direct disturbance to fish to a **less-than-significant** level because the use of BMPs (e.g., source control, detention basins, revegetation, spill containment plan, waterside construction outside of the flood season, erosion control), an in-water work window and operational controls, and a fish rescue plan would maintain surface water quality conditions in adjacent receiving waters and minimize disturbance to fish and aquatic habitats. ***(Similar)***

Impact 4.7-k: Impacts to Fish Species Associated with Operation of Pumping Plants and Surface Drains

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, Phase 4b Project modifications to RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 would not occur. As a result, there would be no potential for impacts related to the operation of the pumping plants or outfalls. There would be **no impact**. *(Lesser)*

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Levee failure would cause flows into, and possibly out of the Natomas Basin, potentially stranding fish. Levee failure could also damage irrigation pumping plants, and depending on the magnitude and location of the levee failure, could result in the pumping plants being shut down for an unknown period of time. This could have an effect on fish entrainment, as well as sedimentation, turbidity, and contaminant coneentrations at the outfalls. A precise determination of significance of the impacts is not possible and cannot be made because the extent of the magnitude of impact is unknown and whether it would be adverse or beneficial. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. *(Currently Unknown)*

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Interference with the Migration of Migratory Fish Species through the Creation of Attraction Flows at Drainage Outfalls

The Phase 4b Project includes modification to the pipes and associated pumping facilities at RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8, and City Sump Pumps 160, 102, and 58; and the reconstruction of the outfall at RD 1000 Pumping Plant Nos. 6 and 8 and City Sump Pumps 160, 102, and 58 under both action alternatives. Modification of the landside intake channel of RD 1000 Pumping Plant Nos. 6 and 8 may also occur.

RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 are drainage pumping plants with their pumps located on the landside of the Sacramento River east levee. New discharge pipes crossing the levee would be required to meet USACE requirements for perimeter levee integrity under flood conditions. Modifications to the pumps may also be required to accommodate the additional pressure from the increase in elevation to maintain the existing pumping rate. Relocation of City Sump Pump 58 may also be required on the landside of the levee. The new discharge pipes at RD 1000 Pumping Plant Nos. 1A and 1B would connect to the existing pipes on the waterside of the levee and would discharge into the river through the existing outfalls. There would be no change in the volume, timing, or quality of stormwater being discharged at RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 compared to the existing condition.

Water quality in the discharge water from the pumping plants would be required to meet NPDES permit requirements (see Mitigation Measures 4.6-b and 4.7-j); therefore, operation of these facilities would not substantially degrade water quality in the Sacramento River.

Anadromous salmonids, during their spawning migrations in the Sacramento River and its tributaries, use primarily olfactory cues to home to their natal streams once they reach the freshwater environment. There is the potential that the flows from the drainage pumps and surface drainage outfalls could create velocity gradients that could attract these fish to attempt to swim up the water discharge. During fall and winter, adult chinook salmon and steelhead are in the Sacramento River system (including the NEMDC and NCC) migrating upstream to

spawning grounds. If these fish become attracted to the flows from the outfall pipes, there is a potential to cause migration delays. With high river levels, the drainage outfalls could directly interface with NEMDC surface water and create a condition where fish could swim directly into the pipes. However, because salmonids imprint on olfactory cues particular to their stream of origin, the probability of flows from pumps or drainage outfalls interfering with migration is low. This impact is considered to be **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.7-l: Impacts on Successful Implementation of Habitat Conservation Plans

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, without Phase 4b Project levee improvements, vegetation removal from the waterside of the levee would be required to conform with USACE guidance regarding levee encroachments, eliminating habitat for several species covered by the NBHCP. This habitat supports the majority of Swainson's hawk nest sites in the Natomas Basin. As described in Impact 4.7-f, above, the impact of the loss of this vegetation on Swainson's hawks would be significant and may not be fully mitigable. Impacts on nesting habitat for Swainson's hawks in the near-term (i.e., before compensation woodland plantings have developed sufficiently to provide replacement nesting habitat) could substantially affect the successful implementation of the NBHCP. Under the No-Action Alternative, therefore, this impact is considered **significant**. ***(Greater)***

The Yuba-Sutter HCP is not an approved document at this time and therefore the No Action Alternative would not affect the successful implementation of the Yuba-Sutter HCP. Under the No-Action Alternative this impact is considered **less than significant**. ***(Similar)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. TNBC's reserve infrastructure would be subject to damage in the event of levee failure; however, the extent of such damage is uncertain. Without flood risk reduction provided by the project, restrictions would be placed on new urban development and remaining habitat would not be at risk for conversion due to development. Because there would be no habitat loss due to urban development, implementation of this alternative would not directly conflict with the implementation of the NBHCP. This potential impact would be **less than significant**. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action)

Implementation of the Adjacent Levee Alternative (Proposed Action) could jeopardize successful implementation of the NBHCP through the conversion of habitats and land uses.

Impacts on NBHCP-Covered Species Viability

The potential for the Adjacent Levee Alternative (Proposed Action) to threaten the viability of populations of certain covered species, reduce the effectiveness of the NBHCP's conservation strategy, and adversely affect attainment of the goals and objectives of the NBHCP, could jeopardize successful implementation of the NBHCP. This would be a **significant** impact.

Impacts on Habitat Availability

The Adjacent Levee Alternative (Proposed Action) would not develop land within NBHCP permit areas except for purposes of upgrading the Natomas Basin perimeter levee system, including improvements to levees, excavation of borrow material, and modifications to drainage and irrigation systems. Construction of these improvements, however, would not cause a net loss in the habitat values provided by these lands for NBHCP-covered species in the Natomas Basin. As noted in Section 5.2, "Growth Inducement," construction of the Phase 4b Project would not induce growth in the NBHCP permit areas but would rather accommodate already planned regional growth.

Impacts to habitat resulting from project implementation are summarized in **Tables 4.7-1** through **4.7-7**. Although temporary and permanent loss of habitat would result from implementation of the Adjacent Levee Alternative (Proposed Action), the overall habitat quality for NBHCP species that use these habitats is unlikely to be adversely affected. This is because many components of the proposed project would support attainment of NBHCP goals and objectives through: (1) the expansion of the amount of protected habitat available for NBHCP-covered species; (2) the consolidation of large areas of habitat, assisting in the expansion of TNBC reserve blocks in the northwestern and southwestern regions of the basin; (3) the connection of core habitat reserves that are distributed throughout the basin through the construction of new canals and the establishment of woodland corridors; and (4) the extension of currently protected habitat blocks by substantially increase acreage and patch size of these habitats.

Given the collective implementation of elements of SAFCA's conservation strategy and proposed mitigation to compensate for temporary and permanent habitat loss, the proposed project would not jeopardize the implementation and efficacy of the NBHCP. However, if habitat creation/preservation is not effectively implemented to provide woodland habitat for NBHCP-covered species, an overall adverse effect could occur. This impact would be **potentially significant**.

Impacts on the Yuba-Sutter HCP

The Yuba-Sutter HCP is not an approved document at this time; therefore, the Adjacent Levee Alternative (Proposed Action) would not affect the successful implementation of the Yuba-Sutter HCP. This impact is considered **less than significant**.

Fix-in-Place Alternative

The impacts of the Adjacent Levee Alternative (Proposed Action) on successful implementation of the NBHCP would also occur under the Fix-in-Place Alternative, with the exception that under this alternative, there would also be extensive removal of riparian vegetation on the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments. This habitat is used by a variety of species covered by the NBHCP, and supports the majority of Swainson's hawk nest sites in the Natomas Basin. As described in Impact 4.7-f, above, the impact of the loss of this vegetation on Swainson's hawks would be significant and may not be fully mitigable. Impacts on nesting habitat for Swainson's hawks in the near term (i.e., before compensation woodland plantings have developed sufficiently to provide replacement nesting habitat) could substantially affect the successful implementation of the NBHCP. Under the Fix-in-Place Alternative, therefore, this impact would be **significant**. ***(Greater)***

As noted above, the Yuba-Sutter HCP is not an approved document at this time; therefore, the Fix-in-Place Alternative would not affect the successful implementation of the Yuba-Sutter HCP. This impact is considered **less than significant**. ***(Similar)***

Mitigation Measure 4.7-l: Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on the successful implementation of the NBHCP, the project proponent(s) shall implement the following measures:

- Implement Mitigation Measures 4.7-a and 4.7-c though 4.7-h.
- Based on the current value-per-acre, the project proponent(s) shall contribute funds to TNBC to offset direct impacts to TNBC reserves on an acre-per-acre basis, drawing upon TNBC's existing land surplus.

Responsibility: Project proponent(s)

Timing: See Mitigation Measures 4.7-a and 4.7-c though 4.7-h

Implementing this mitigation measure, and Mitigation Measures 4.7-a, and 4.7-c though 4.7-h, would reduce potential effects from the Adjacent Levee Alternative (Proposed Action) to a **less-than-significant** level because these measures would ensure that the Adjacent Levee Alternative (Proposed Action) would be implemented in a manner that is consistent with, and does not jeopardize successful implementation of, the NBHCP. Creating woodland and aquatic movement corridors and other replacement habitats, conducting protocol-level surveys for special-status plants and wildlife, implementing construction in a manner that reduces loss of habitat and direct mortality of species, implementing measures that are part of the NBHCP related to special-status species, and creating and implementing a management plan in consultation with USFWS and DFG would reduce the impact on consistency with the NBHCP.

Implementing this mitigation measure for the Fix-in-Place Alternative, however, would partially reduce the impact but not to a less-than-significant level. Because of the likely loss of a substantial amount of nesting habitat for Swainson's hawk, these measures could be insufficient to ensure that the Fix-in-Place Alternative would not jeopardize successful implementation of the NBHCP. Thus, this impact under the Fix-in-Place Alternative would remain **significant and unavoidable** because there are no feasible mitigation measures to fully reduce this impact to a less-than-significant level. ***(Greater)***

4.7.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, there would be no impacts to sensitive aquatic habitats or impacts related to fish attraction at the drainage outfalls. However, impacts on waterside woodland, wildlife corridors, Swainson's hawk nesting, and valley elderberry longhorn beetle cannot be fully reduced to less-than-significant levels without the successful creation of waterside planting areas sufficient in size to fully and adequately compensate for the removal of extensive amounts of waterside vegetation along the Sacramento River east levee. Because mitigation cannot be required for the No-Action Alternative, this impact would remain significant and unavoidable.

In the event of levee failure under the No-Action Alternative, impacts to waterside woodlands, wildlife corridors, fish, special-status plant and animal species, and sensitive aquatic habitats are uncertain. Although there would be some unknown level of fish mortality through physical injury and stranding of fish entering Natomas Basin through a levee breach and some impacts associated with degraded water quality on fish habitat, the severity of flood conditions can vary substantially, and the specific effects on fish cannot be reasonably predicted. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action), implementation of mitigation measures described above would reduce long-term impacts to woodlands, Swainson's hawk, and wildlife corridors for aquatic species, bird

species, fish, special status vernal pool crustaceans, and other special-status species to less-than-significant levels and would not result in residual significant adverse impacts. These measures would also ensure that the Adjacent Levee Alternative (Proposed Action) would not jeopardize successful implementation of the NBHCP. Although no permanent impacts would occur, impacts to woodland habitats would remain significant and unavoidable for many years before reaching a less-than-significant level because replacement plantings would require at least 10–15 years to mature. This temporal loss of woodland habitat would also result in significant and unavoidable impacts to Swainson's hawk nesting habitat related to this temporal loss of habitat.

Implementation of mitigation measures described above for the Fix-in-Place Alternative would not be sufficient to fully mitigate impacts to woodland habitats, loss of wildlife corridors, or the likely loss of a substantial amount of nesting habitat for Swainson's hawk along the waterside of the Sacramento River east levee. These measures would also be insufficient to ensure successful implementation of the NBHCP. Residual impacts would occur because of the extensive loss of waterside vegetation, the temporal loss of habitat while replacement vegetation matures, and the limited extent of the new plantings that would reduce the value of this replacement habitat to wildlife and bird movement. Because no other feasible mitigation measures are available, impacts under the Fix-in-Place Alternative would remain significant and unavoidable.

With implementation of the mitigation measures described in this section, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would not result in any residual significant impacts related to giant garter snake, valley elderberry longhorn beetle, northwestern pond turtle, burrowing owl, fish, or special status vernal pool crustaceans.

With implementation of the mitigation measures described in this section, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would not result in any residual significant impacts related to sensitive aquatic habitats, including wetlands. In fact, successful implementation of the mitigation measures for both action alternatives would have a beneficial impact on overall acreage and functions of waters of the United States in the Natomas Basin.

4.8 CULTURAL RESOURCES

This section evaluates the Phase 4b Project's potential effects on cultural resources. Cultural resources include prehistoric archaeological sites and artifacts, historic-era buildings and structures, and places used for traditional Native American practices or other properties with special cultural significance to Native Americans (Traditional Cultural Properties [TCPs]).

This project is subject to both Section 106 of the National Historic Preservation Act (NHPA), hereinafter referred to as "Section 106," and CEQA; each has specific cultural resources mitigation requirements. The regulatory setting for management of cultural resources is provided in Section 3.8, "Cultural Resources." The requirements of the NHPA are described in Section 6.8, "Compliance with Federal Environmental Laws and Regulations." In general, the standards and process required for identifying and managing effects on cultural resources under the NHPA are used for determining the significance of impacts under NEPA.

4.8.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.8.1.1 METHODOLOGY

This section describes the methods used to identify and evaluate cultural resources that may be affected by the Phase 4b Project.

Native American Tribal Consultation

In May 2008, USACE, SAFCA, and the State Historic Preservation Officer (SHPO) became signatories to a Programmatic Agreement (PA) (described in Section 6.8), concluding compliance with Section 106 (**Appendix E1**). Native American tribes who were consulted by USACE were the Ione Band of Miwok Indians, the Shingle Springs Band of Miwok Indians, and the United Auburn Community, and all were invited to participate in the PA. Native American monitors worked with SAFCA to assist in the treatment of Native American human remains and items associated with Native American burials discovered during the project inventory process, as required by the PA (Section VI).

EDAW (now AECOM) sent a letter of inquiry to the Native American Heritage Commission (NAHC) on June 12, 2007, asking for information or concerns regarding the project area, as well as a list of individuals or organizations that might have information or concerns regarding the project area. On June 19, 2007, Debbie Pilas-Treadway of the NAHC responded and indicated that no known sites were found in the Sacred Lands File that were located within the project area or in the immediate vicinity. Ms. Pilas-Treadway also provided a list of individuals who could be contacted concerning cultural resources in the project area. These individuals were sent contact letters on June 21, 2007, with information regarding the project and a request for any information they might provide or concerns that they might have about the project. This program of correspondence did not reveal new resources. The complete results of this program of investigation are described in the Phase 2 EIR (SAFCA 2007: 3.8-11). The correspondence is included in **Appendix E2**.

The NAHC also designated a most likely descendant (MLD) for the project, John Tayaba of the Shingle Springs Band of Miwok Indians. Mr. Tayaba has been designated as the MLD because he is a member of the Shingle Springs Band of Miwok Indians, and the Tribe's aboriginal territory includes the NLIP project area. Mr. Tayaba is designated to provide input on how to reinter identified prehistoric human remains that are uncovered in the NLIP area with appropriate dignity per California Public Resources Code Section 5097.98. Representatives from SAFCA, USACE, AECOM, and Mr. Tayaba or his delegates meet bi-weekly to discuss management of cultural resources for the NLIP and milestones in the Section 106 process.

Information Center Records Searches

Records searches were performed in 2006 and 2007 for the entire NLIP footprint, which includes the proposed Phase 4b Project footprint. Most of the searches were conducted at the North Central Information Center (NCIC) of the California Historical Resources Information System, located at California State University, Sacramento. The NCIC records search covered portions of the project area in Sacramento County. Records searches were also conducted at the Northeast Information Center (NEIC), which maintains cultural resource records for Sutter County. The searches at both facilities included, but were not necessarily restricted to, an examination of the following resources:

- the State Office of Historic Preservation's *Historic Property Directory and Determination of Eligibility* (2006),
- the National Register of Historic Places and California Registers of Historical Resources (2006),
- *California Inventory of Historic Resources* (1976 and updates),
- *Historic Properties Directory* (2006),
- *California Historical Landmarks* (1996 and updates),
- *California Points of Historical Interest* (1992 and updates),
- *Caltrans Local Bridge Survey* (1987), and
- various historic maps.

The record search results are described in detail in Section 3.8.2.3, "Records Search Results."

Inventory and Management of Resources Within the Phase 4b Project Area of Potential Effect

USACE and SAFCA are required to perform an inventory, evaluation, and finding of effect for identified resources for the area of potential effect (APE) for each project phase, under the executed PA, as described below (Stipulation IV[A]). Inventory and evaluation typically consists of the following steps:

- conducting a pedestrian survey of the project footprint;
- performing limited shovel testing or probing where ground cover impairs surface visibility;
- monitoring preconstruction geotechnical borings and backhoe excavations;
- documenting identified resources; and
- evaluating identified resources by application of eligibility criteria, and where necessary, limited test excavation to assist in resource evaluation.

A pedestrian survey has been completed for a portion of the Phase 4b Project footprint along the Sacramento River east levee and in the Fisherman's Lake Borrow Area. However, an inventory of cultural resources has not been conducted for the majority of the elements of the Phase 4b Project, including the South Fisherman's Lake Borrow Area. The project proponent(s) will complete an inventory of all project features that involve ground-disturbing work in native soils, including new proposed borrow locations. The project proponent(s) will also complete evaluations, findings of effect, and treatment of identified resources where required. Within the portion of the Phase 4b Project footprint that has been surveyed, four identified resources require evaluation to determine if they are historic properties or historical resources (see **Table 4.8-1**, below). If they are eligible for listing on the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), the project proponent(s) will make a finding of effect and make recommendations for further management in an Historic Property Treatment Plan (HPTP), as required under Stipulation V(A) of the PA. The remaining identified resources in the Phase 4b Project footprint have been determined ineligible for listing on the NRHP or CRHR (the SHPO has concurred with USACE's and SAFCA's findings).

4.8.1.2 THRESHOLDS OF SIGNIFICANCE

National Historic Preservation Act

The Phase 4b Project would result in a significant impact on an historic property as defined under Section 106 if it would result in an adverse effect on that resource. An adverse effect would occur if the project would alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

California Environmental Quality Act

The Phase 4b Project would result in a significant impact on a cultural resource if it would result in a substantial adverse change in an historical resource, as defined under CEQA. A substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired. The Phase 4b Project would also result in a significant impact on a cultural resource if it would disturb any interred human remains.

4.8.2 IDENTIFIED RESOURCES

Table 4.8-1 contains all identified resources, other than elements of RD 1000 (discussed separately under Impact 4.8-a, below) in the Phase 4b Project footprint. For all resources that are determined ineligible, no further management is required.

Table 4.8-1
Identified Cultural Resources in the Phase 4b Project Footprint by Project Element

Project Element	Resource/Type	Eligibility Status
Sacramento River east levee Reach A:16–20—levee widening and/or slope flattening, and seepage remediation	CA-Sac-164/prehistoric site with burials on the waterside of the Sacramento River east levee	Nominated to the NRHP, assumed eligible, not listed in the NRHP online database at this time.
American River north levee Reach1:1–4—levee widening and/or slope flattening, and seepage remediation	–	–
NEMDC North (west levee)—levee raising and widening and/or slope flattening, and seepage remediation	–	–
PGCC west levee—levee raising and widening and/or slope flattening	–	–
NEMDC South (west levee), Station 313+00 to 318+50—levee raising and widening and/or slope flattening	CA-Sac-517H/historic debris	Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)
SR 99 bridge remediation at NCC south levee	–	–
West Drainage Canal realignment and bank improvements	–	–
Riego Road Canal relocation	–	–
Vestal Drain relocation	–	–
Morrison Canal relocation	CA-Sut-139H (NLIP-6)/historic farm complex	Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)

Table 4.8-1
Identified Cultural Resources in the Phase 4b Project Footprint by Project Element

Project Element	Resource/Type	Eligibility Status
Chappell Drain and Ditch improvements	–	–
Relocation of other private irrigation ditches on PGCC and NEMDC North	–	–
Relocation of private irrigation wells along the Sacramento River east levee and west levee of the NEMDC	–	–
New Borrow Sites/Areas		
Excavation of South Fisherman's Lake Borrow Area	CA-Sac-18/prehistoric archaeological site (lithic scatter)	Requires evaluation/test excavation
Excavation of Triangle Properties Borrow Area	–	–
Excavation of West Lakeside School Site	–	–
Previously Analyzed Borrow Sites/Areas		
Fisherman's Lake Borrow Area	CA-Sac-1115/H (NLIP-25)/historic farm complex	Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2009a)
	CA-Sac-268/prehistoric archaeological site	Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2009b)
	CA-Sac-494H/historic debris scatter	Requires evaluation/test excavation
	NLIP-38/historic farmstead	Requires evaluation
	NLIP-40/prehistoric archaeological site	Requires evaluation/test excavation
Krumenacher Borrow Site	CA-Sac-484H	Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)
	CA-Sac-483/H	Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)
Twin Rivers Unified School District Stockpile Site	–	–
Brookfield Borrow Site (managed marsh conversion)	Inventory complete; no resources located within borrow site	
Woodland Compensation Areas		
American River Parkway downstream of SR 160	–	–
Dry Creek floodway east of the NEMDC	–	–
Remainders of parcels to be acquired in Reach A:16 where levee improvements and/or Riverside Canal would already use most of the parcels	–	–

Notes: CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places
*For all resources determined ineligible, the SHPO has concurred with these findings during the course of Section 106 consultation.
**Fields for resources that require inventory and evaluation are indicated as "–."
Source: Data compiled by AECOM in 2009

4.8.3 IMPACTS AND MITIGATION MEASURES

This section describes the impacts of the Phase 4b Project on cultural resources and outlines treatment measures that may avoid or reduce the anticipated impacts. These measures would be implemented by the project proponent(s), in consultation with the SHPO and the MLD, as appropriate. The specific documents that will further define and describe mitigation measures and monitoring responsibilities include HPTPs and the Construction Monitoring and Inadvertent Discovery Plan that the project proponent(s) will prepare, in compliance with the PA.

Impacts that are significant under CEQA are also considered adverse effects under the NHPA.

Impact 4.8-a: Potential Changes to Elements of Reclamation District 1000 and the Rural Landscape District

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly disturb elements of RD 1000 and the Rural Landscape District. There would be **no impact**. *(Lesser)*

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented to ensure that the Basin has achieved 0.005 AEP (200-year flood risk reduction). A levee failure in the Natomas Basin could result in flooding that could alter elements of RD 1000. However, the major elements and overall character of RD 1000 are unlikely to be significantly or adversely affected because levee systems by their nature are subject to ongoing repair and upgrades. Repairs would thus be consistent with the character-defining elements of the landscape. This potential impact is considered **less than significant**. *(Similar)*

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 3.8.2.2, "Historic Setting," RD 1000 is a rural historic landscape district that contains numerous elements associated with flood damage reduction and drainage infrastructure. An evaluation of RD 1000 was conducted both to determine NRHP eligibility of the district and to evaluate whether the district would be significantly affected by flood damage reduction projects (levee modifications) planned and subsequently implemented by USACE as part of the American River Watershed Project (USACE 1991). RD 1000 was identified as eligible for inclusion in the NRHP as a Rural Historic Landscape District. Because RD 1000 was determined eligible for listing on the NRHP, it is also eligible for listing on the CRHR and is an historical resource under CEQA. The finding of effect statement concluded that USACE projects would adversely affect both contributing and noncontributing elements of RD 1000 by allowing for greater development to occur in the region. As a result, mitigation measures were adopted and incorporated into USACE's project. These consisted of Historic American Engineering Record (HAER) documentation, which was prepared by Peak & Associates (1997), videotapes of historic properties, and a list of repositories where copies of the information would be made available to the public.

Work associated with the Phase 4b Project under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative may alter contributing elements of RD 1000. This work includes improvements to the perimeter levees for the Natomas Basin as well as improvements to pumping stations, many of which are contributing elements to this district. These changes may be consistent with the character-defining elements of

RD 1000, including the levees and the landscape elements of the district, because flood damage reduction infrastructure, by its nature, requires ongoing maintenance and alteration. However, such changes could diminish the significance or integrity of contributing elements of the district, under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. This impact is considered **potentially significant** pending identification and evaluation of effects on contributing elements of RD 1000. ***(Similar)***

Mitigation Measure 4.8-a: Incorporate Mitigation Measures to Documents Regarding any Elements Contributing to RD 1000 and the Rural Landscape District and Distribute the Information to the Appropriate Repositories

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The management of the cultural resources that constitute the contributing elements of RD 1000 is governed by the PA. Because the elements of the RD 1000 historic landscape district have already been recorded, a new inventory of these resources is not required under Stipulation IV(A) of the PA. After an APE has been determined per Stipulation III(C), a qualified architectural historian shall determine if contributing elements of the district are present in the APE. If contributing elements are present, the architectural historian shall update records for these resources and evaluate those elements to determine if they retain integrity. Because much of the Natomas Basin has been developed, it is possible that changes to the setting have diminished the integrity and thus eligibility of contributing elements in the APE. If the elements in the APE retain eligibility, the architectural historian shall make a finding of effect.

If there is an adverse effect to a contributing element (under Section 106) or a significant impact on the resource's integrity as an historical resource (under CEQA), the architectural historian shall review existing HAER documentation and determine whether any augmentation of this documentation is needed. The original documentation for the American River Watershed Project (completed in 1997) contemplated changes to the setting of the district and thus provided comprehensive documentation to record the district before urbanization (Peak & Associates 1997). This original documentation was intended to adequately record and preserve records of the elements that may be affected. However, if this documentation is not sufficient for adversely affected and contributing elements, the project proponent(s) shall prepare an HPTP stipulating additional HAER documentation, or other similar treatment as required under Stipulation V(A). After consultation with the SHPO, the project proponent(s) shall implement the required documentation or treatment prior to construction. Any additional documentation that is needed shall be prepared and distributed to appropriate public repositories.

Responsibility:	Project proponent(s)
Timing:	Prior to any project activity that would result in adverse effects

Implementing this mitigation and treatment measure would reduce the impacts of potential changes to elements of RD 1000 under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-significant** level. If required, this treatment measure would be incorporated into an HPTP developed through consultation with the SHPO. ***(Similar)***

Impact 4.8-b: Potential Damage or Disturbance to Known Archaeological or Architectural Resources from Ground-Disturbance or Other Construction-Related Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly disturb any known archaeological or architectural resources. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Substantial flooding could result in inundation, or scour at the location of a levee break, and damage or destruction to any cultural resources at the location of the break. Should a levee break occur at the location of a cultural resource, the resource could be obliterated by the scourhole (potentially 1,000 feet wide and 80 feet deep) that would be created by the levee break. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction of the Phase 4b Project may affect two identified prehistoric archaeological deposits: NLIP-40, which consists of a newly identified prehistoric resource that occurs in the Fisherman's Lake Borrow Area and was not analyzed as part of the Phase 4a Project; and CA-Sac-18, another prehistoric archaeological deposit that occurs in the South Fisherman's Lake Borrow Area (see **Table 4.8-1**). Because both of these resources occur within borrow sites that would be used under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, borrow activity may disturb these resources under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. These resources require evaluation to determine if they are eligible for listing on the NRHP or the CRHR. If these resources are eligible for listing on either of these registers and borrow activity would disturb these resources, this impact would be significant.

The prehistoric deposit recorded as CA-Sac-164 contains a mortuary assemblage and has been nominated to the NHRP; however, available data suggest that this resource occurs only on the waterside of the Sacramento River east levee, and thus would not be affected by Phase 4b Project construction activities. The historic farmstead documented as NLIP-38 has been identified in the Fisherman's Lake Borrow Area, and requires evaluation. If this resource is determined eligible for listing on the NRHP or CRHR, and it would be demolished or altered during project activities, this impact would be **significant**. The historic archaeological deposit CA-Sac-494H consists of a scatter of historic-era debris that was also identified in the Fisherman's Lake Borrow Area. This resource requires evaluation. If borrow activity would disturb this resource and the site is eligible for listing on the NRHP or CRHR, the impact would be significant.

The evaluation of eligibility and determination of effects on all identified resources would be made by consultation between the project proponent(s), the SHPO, and the MLD, as appropriate. The identified resources that require evaluation may be significant for their association with important historic themes, their data potential, or for their importance to local Native American groups, and may have the integrity to convey this significance. Such resources would be eligible for listing on the NRHP and the CRHR. As described above, it is possible that ground-disturbing work associated with the Phase 4b Project may, absent mitigation or treatment, result in significant impacts to NLIP-40, CA-Sac-18, NLIP-38, and CA-Sac-494H. This impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.8-b: Avoid Ground Disturbance Near Eligible and Listed Resources to the Extent Feasible, Prepare a Finding of Effect, and Resolve any Adverse Effects through Preparation of an HPTP

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures:

- Complete an evaluation of identified resources, and determine the effect of proposed work on all eligible or listed resources in accordance with Stipulation IV(A) of the PA.
- Consult with the SHPO, the MLD, and other consulting parties such as Native American individuals and organizations, to develop appropriate treatment or mitigation in an HPTP, per Stipulation V(A) of the PA if the project would result in adverse effects on eligible resources.
- When feasible, treatment shall consist of documentation of the site and reduction of adverse effects by protecting the resource through capping or avoidance of the resource. Where physical impacts cannot be avoided and such physical impacts could damage the data these sites contain, including mortuary components, further mitigation may be required. Such mitigation may consist of data recovery excavations to retrieve those values and mortuary assemblages that contain significance for archaeology after consultation with and the agreement of the Native American MLD, where appropriate.
- Monitor potentially destructive construction in the vicinity of documented resources, as required under the Construction Monitoring and Inadvertent Discovery Plan.

Responsibility:	Project proponent(s)
Timing:	Evaluation, findings of effect, and treatment would be performed in phases, prior to construction of Phase 4b Project elements that have the potential to result in impacts on identified NRHP- or CRHR-eligible resources

Project implementation would involve ground-disturbing work that both covers large areas of land, and includes deep excavation within the existing and adjacent levee footprint. Flood damage reduction measures that only involve capping of sites with minimization of vibratory and compaction impacts may reduce significant impacts to less-than-significant levels. The complex and stratified geomorphology of the Basin as well as the magnitude of the construction are such that implementation of all treatment and mitigation may not fully reduce all adverse impacts to known archaeological or architectural resources under either the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative to a less-than-significant level. For example, identified sites may have buried components containing mortuary elements that cannot be adequately documented prior to intrusive work. Therefore, this impact would remain **significant and unavoidable**. ***(Similar)***

Impact 4.8-c: Potential Damage to or Destruction of Previously Unidentified or Undiscovered Cultural Resources from Ground-Disturbance or Other Construction-Related Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alterative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly damage or destroy previously undiscovered cultural resources, including historic-era and prehistoric resources. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to this system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Substantial flooding could occur and result in inundation of unknown subsurface prehistoric resources, or scour at the location of a levee break. However, before construction of the levee system, prehistoric resources would have been subject to the effects of periodic flooding over several centuries and are unlikely to be significantly affected by additional episodes of inundation. Should a levee break occur at the location of a previously unidentified and significant prehistoric or historic-era resource, the resource would likely be obliterated by the scourhole (potentially 1,000 feet wide and 80 feet deep) that would be created by the levee break. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would include construction along the Sacramento River east levee, American River north levee, PGCC, and NEMDC; changes to the interior drainage and irrigation infrastructure; and excavation of borrow sites. These construction activities would involve ground disturbance and excavation that could damage or destroy previously undiscovered cultural resources.

Sacramento Valley floodplains and riverbanks were extensively occupied and used by prehistoric populations. Prehistoric occupation sites frequently took the form of mounds constructed above the natural ground surface by prehistoric human populations, but the upper portions of many of these sites have been destroyed by modern agricultural cultivation and leveling of fields. Thus the remains of these sites are no longer easily visible above ground. Additionally, intermittent flooding deposited layers of alluvium over prehistoric deposits, leaving these resources intact below grade with no surface manifestations. Areas within the Phase 4b Project footprint are also commonly covered with agricultural crops or residential developments such as lawns, driveways, and other impervious surfaces associated with residential development. These conditions may obscure both prehistoric and historic archaeological deposits.

The Natomas Basin also contains numerous historic-era resources such as irrigation features, ranches, and agricultural buildings that may not have been recorded and evaluated as part of RD 1000.

Technical work necessary to identify additional prehistoric and historic-era resources in the Phase 4b Project footprint is ongoing, and significant resources may be identified after EIS/EIR certification and approval. Any such resources could be adversely affected by construction-related and other ground-disturbing activities. It is possible that impacts on yet unidentified resources cannot be avoided through changes in project design or configuration of borrow sites identified in Chapter 2, "Alternatives." This impact is considered **potentially significant**. ***(Similar)***

Where cultural resources are buried below sterile soils or where mounds have been truncated with no surface manifestation, discovery prior to construction during cultural resources inventories is not always possible. Furthermore, proposed improvements such as cutoff walls would occur under the footprint of the existing levees. These levees would only be degraded immediately prior to construction; thus, there are no feasible methods of conducting a cultural resources inventory within the footprint of these activities. Degrading the levee prior to construction for cultural resource investigations would not be feasible because it would require demolishing the levee for cultural investigations during summer in advance of constructing and rebuilding the levee for the flood season, at substantial expense and project delay.

In a similar fashion, if significant historic-era resources occur within the footprint of Phase 4b Project improvements, it may not be possible to avoid alteration or demolition of these resources.

Excavation, grading, and other ground-disturbing activities required during construction of improvements and excavation of borrow from sites identified in Chapter 2, "Alternatives," could encounter and damage previously unknown or unidentified historic-era and prehistoric cultural resources that may be eligible for listing on the NRHP, CRHR, or both, under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. This impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.8-c: Train Construction Workers before Construction, Monitor Construction Activities, Stop Potentially Damaging Activities, Evaluate any Discoveries, and Resolve Adverse Effects on Eligible Resources, if Encountered

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures.

- Update record searches and perform additional literature review as necessary.
- Complete surveys to identify cultural resources in the Phase 4b Project footprint, per mitigation identified in the Phase 2 EIR (SAFCA 2007:3.8-31) at the program level.
- Resolve significant impacts on resources eligible for listing on the NRHP or CRHR as required under the PA.
- Implement Mitigation Measure 3.4-d from the Phase 2 Project SEIR (see below with some refinement), as appropriate within the project footprint to identify interred human remains (SAFCA 2009: 3.4-10).

  Mitigation Measure 3.4-d: Conduct Additional Backhoe and Canine Forensic Investigations As Appropriate (Incorporated by Reference Herein)

  The project proponent(s) may implement the following measures during Section 106 consultation, as appropriate:

  - Additional inventory may be conducted at appropriate intervals along the Sacramento River east levee, using a backhoe excavator, to increase the sample of information at depths below 6 feet that cannot be reached with conventional shovel test methods if additional inventory is appropriate and feasible. Such methods may be used only when necessary to address potential project-related effects to cultural resources because other methods are ineffective, or project circumstances dictate that such resources must be identified in advance of construction. The project proponent(s) shall consult with the MLD regarding the use of such methods. The project proponent(s) recognize the Tribe's preference for less invasive methods of investigation such as the use of canine forensics.
  - Where this process or additional inventory efforts reveal other resources, canine forensic investigations may be used as a way of identifying interred human remains with minimal disturbance, and for further refinement of and understanding of the constituents of identified resources, where canine forensic investigations are appropriate and feasible.
- Before construction begins, a qualified professional archaeologist retained by the project proponent(s) shall give a presentation and training session to all construction personnel so that they can assist with identification of undiscovered cultural resource materials and avoid them where possible. Such training shall note the importance of these materials to

Native American groups that attach cultural significance to resources in the Phase 4b Project area.

- A qualified archaeologist shall monitor ground-disturbing construction activities where sensitivity for unidentified resources is high and such monitoring is feasible, and would provide a measure of protection against inadvertent damage to such resources. In areas of known sensitivity, such as archaeological sites containing Native American burials, a Native American monitor will be invited to be present, as appropriate, to observe potentially destructive construction activities and to ensure proper treatment of human remains in accordance with State law. If a previously unidentified archaeological resource is uncovered during construction, ground-disturbing activities shall be halted in the vicinity of the find and the construction contractor, the project proponent(s), the MLD, the NAHC (if appropriate), and other appropriate parties shall be notified regarding the discovery. Where construction would consist of cutoff walls excavated in a bentonite and/or cement slurry, it is anticipated that it will not be possible to identify the precise location of any materials found in spoils or at soil mixing stations, thus construction cannot stop during excavation of cutoff walls if resources are discovered in spoils.
- The project proponent(s) shall then consult with the SHPO to determine the eligibility of the resource. If the project proponent(s), in consultation with the SHPO, concur that the resource is eligible and the project may result in adverse effects on the resource, the project proponent(s) shall prepare and implement an HPTP as required under the PA, Stipulation V(A). The HPTP shall be prepared in consultation with the SHPO, and other appropriate consulting parties such as Native American individuals or organizations as appropriate.
- Work may only resume when either all necessary treatment has been performed under the HPTP, or construction in the vicinity will not result in adverse effects, and that work does not encroach within 100 feet of the known boundaries of the resource, or the boundaries designated by the SHPO, per the PA, Stipulation V(B)(2).

Responsibility:	Project proponent(s)
Timing:	Complete surveys, additional backhoe testing, and canine forensics (as appropriate) before the start of ground-disturbing construction activities; train construction workers before construction; and monitor construction activities during construction

It may be possible to avoid resources or recover and preserve them through measures stipulated in an HPTP. However, as with all ground-disturbing construction impacts, there is always the possibility of disturbing and adversely affecting unidentified/buried resources before they can be discovered and appropriately protected. There is also the possibility that design constraints for proposed improvements and borrow sites would preclude the ability of the project proponent(s) to avoid impacts on significant resources identified during inventory efforts. Therefore, implementation of these mitigation measures may not fully reduce all impacts under the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative to a less-than-significant level. Thus, this impact would remain **significant and unavoidable**. ***(Similar)***

Impact 4.8-d: Potential Discovery of Human Remains During Construction

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alterative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the discovery of human remains. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Substantial flooding could occur and result in inundation of unknown human remains, or scour at the location of a levee break. However, before construction of the levee system, these resources would have been subject to the effects of periodic flooding over several centuries. Should a levee break occur at the location of the prehistoric resource site, any interred and previously unidentified burials would be obliterated by the scourhole (potentially 1,000 feet wide and 80 feet deep) that would be created by the levee break. A precise determination of significance is not possible and cannot be made because it is unknown where such an event would occur and whether any resources would be affected. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Prehistoric human remains have been found at several prehistoric sites in the vicinity of the Phase 4b Project area. Previously unknown buried human remains may be unearthed, damaged, or destroyed during excavation activities associated with project construction and excavation of borrow from the sites identified in Chapter 2, "Alternatives." This work includes construction of levee improvements, seepage remediation, and changes and improvements to drainage and irrigation infrastructure. Both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative have a high risk of disturbing previously undiscovered human remains because of the extent of ground-disturbing work required for the project. It should be noted that the Pleasant Grove Cemetery District cemetery occurs on the northern edge of the proposed Triangle Properties Borrow Area. Although the cemetery is not recorded as a cultural resource, it contains human remains subject to management required under CEQA. The cemetery occurs on the south side of Howsley Road east of the intersection with Pacific Avenue. This resource would be excluded from the footprint of borrow activities. Therefore, the Proposed Action would not affect human interments in the cemetery. However, because of the sensitivity for buried human remains in the areas where ground disturbing work would occur, this impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.8-d: Stop Work Within an Appropriate Radius Around the Find, Notify the Applicable County Coroner and Most Likely Descendant, and Treat Remains in Accordance with State Law and Measures Stipulated in an HPTP Developed in Consultation between the Project Proponent(s) and the SHPO

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

If human remains are uncovered during ground-disturbing activities, the project proponent(s) shall cease all ground-disturbing activities within the vicinity of the find, if known. If the discovery occurs in spoils removed from construction of cutoff walls, the remains shall be treated in accordance with State law. Because cutoff walls are constructed at great depth within a slurry of soil and bentonite and/or cement, it is anticipated that it will not be possible to pinpoint the location of human remains that may be disinterred during construction of these features, and it will not be feasible or useful to stop construction. Discovered remains removed from cutoff wall spoils will be treated as required by State law, as follows. The project proponent(s)'s archaeological monitors and/or the contractor shall notify the relevant county coroner and an archaeologist skilled in osteological analysis to determine the nature

of the remains. If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (California Health and Safety Code Section 7050[c]). The NAHC will designate an MLD who may decide how to reinter the remains with appropriate dignity in an appropriate location. John Tayaba has been designated as the MLD for previous discoveries, and he would likely make recommendations for reinterment of human remains in the event of a discovery.

Prehistoric remains are usually found in the context of an archaeological site. The treatment of any associated site shall be in consultation with the MLD, as required under the PA and Mitigation Measure 4.8-c. While unlikely, it is possible that ground-disturbing work may disinter human remains associated with an historic burial that is not subject to the jurisdiction of the NAHC. Any such resource shall be treated as an archaeological discovery as required by Mitigation Measure 4.8-c.

Responsibility:	Project proponent(s)
Timing:	During ground-disturbing construction activities, in the event of a discovery

Monitoring (Mitigation Measure 4.8-c) and discovery protocols would reduce the chance of damage to or destruction of previously undiscovered human remains. However, it is possible that despite construction monitoring and implementation of this mitigation measure, ground-disturbing work would disinter and damage human remains under either the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative. Therefore, implementation of this mitigation measure may not fully reduce the impact to potential interred human remains under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-significant level. Thus, this impact would remain **significant and unavoidable**. ***(Similar)***

4.8.4 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, the significance determinations for potential impacts to known and undiscovered cultural resources and to undiscovered human remains due to levee failure are uncertain. Because of this uncertainty, these impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

As described under Mitigation Measures 4.8-b, 4.8-c, and 4.8-d, potential construction impacts on identified cultural resources, previously unidentified cultural resources, and interred human remains are potentially significant and unavoidable under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, despite the implementation of all feasible mitigation measures, because there is a potential that resources could still be adversely affected. Therefore, significant and unavoidable impacts would likely remain even with implementation of the recommended mitigation measures.

4.9 PALEONTOLOGICAL RESOURCES

4.9.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

Paleontological resources (fossils) are the remains or traces of prehistoric animals and plants that are 11,000 years old or older. This section assesses the potential for earthmoving activities associated with the Phase 4b Project to affect scientifically important fossil remains. **Plate 3-4** shows the geologic formations in the project area.

4.9.1.1 METHODOLOGY

The potential paleontological importance of the project area can be assessed by identifying the paleontologieal importance of exposed rock units within the project site. Because the aerial distribution of a rock unit can be easily delineated on a topographic map, this method is conducive to delineating parts of the projeet area that are of higher and lower sensitivity for paleontological resources and to delineating parts of the project area that may require monitoring during construction.

A paleontologically important rock unit is one that (1) has a high potential paleontological productivity rating and (2) is known to have produced unique, seientifieally important fossils. The potential paleontological produetivity rating of a rock unit exposed in the project area refers to the abundance/densities of fossil specimens and/or previously recorded fossil sites in exposures of the unit in and near the project area. Exposures of a specific rock unit at the project site are most likely to yield fossil remains representing particular species in quantities or densities similar to those previously recorded from the unit in and near the projeet area.

The following tasks were completed to establish the paleontological importance of each rock unit exposed at or near the project area:

- the potential paleontological produetivity of each rock unit was assessed, based on the density of fossil remains previously documented within the rock unit; and
- the potential for a rock unit exposed in the projeet area to contain a unique paleontological resouree was considered.

In its standard guidelines for assessment and mitigation of adverse impacts on paleontological resources, the Society of Vertebrate Paleontology (SVP) (1995) established three categories of sensitivity for paleontological resources: high, low, and undetermined. Areas where fossils have been previously found are considered to have a high sensitivity and a high potential to produce fossils. Areas that are not sedimentary in origin and that have not been known to produce fossils in the past typically are considered to have low sensitivity. Areas that have not had any previous paleontological resource surveys or fossil finds are considered to be of undetermined sensitivity until surveys and mapping are performed to determine their sensitivity. After reconnaissance surveys, observation of exposed cuts, and possibly subsurface testing, a qualified paleontologist can determine whether the area should be categorized as having high or low sensitivity. In keeping with the significanee criteria of the SVP (1995), all vertebrate fossils are generally categorized as being of potentially significant scientific value.

4.9.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to paleontological resources if they would directly or indirectly destroy a unique paleontological resource or site.

For the purposes of this analysis, an individual vertebrate fossil specimen may be considered unique or significant if it is identifiable and well preserved, and it meets one of the following criteria:

- a type specimen (i.e., the individual from which a species or subspecies has been described);
- a member of a rare species;
- a species that is part of a diverse assemblage (i.e., a site where more than one fossil has been discovered) wherein other species are also identifiable, and important information regarding life history of individuals can be drawn;
- a skeletal element different from, or a specimen more complete than, those now available for its species; or
- a complete specimen (i.e., all or substantially all of the entire skeleton is present).

For example, identifiable vertebrate marine and terrestrial fossils are generally considered scientifically important because they are relatively rare. The value or importance of different fossil groups varies, depending on the age and depositional environment of the rock unit that contains the fossils, their rarity, the extent to which they have already been identified and documented, and the ability to recover similar materials under more controlled conditions such as part of a research project. Marine invertebrates are generally common, well developed, and well documented. They would generally not be considered a unique paleontological resource.

4.9.2 IMPACTS AND MITIGATION MEASURES

Impact 4.9-a: Disturbance of Unknown Unique Paleontological Resources during Earthmoving Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no excavation activities would occur within the Phase 4b Project footprint or proposed borrow sites; therefore, no potential exists for the project to directly disturb any paleontological resources that may be present in those areas. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Because any paleontological resources in the Basin would be relatively deep within the ground and would have existed through numerous past flooding episodes, they would be unlikely to sustain damage in the event of flooding in the absence of improvements to the perimeter levee system. This potential impact is considered **less than significant**. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Areas along the Sacramento River east levee are associated with Holocene-age alluvium. By definition, sediments associated with Holocene-age alluvium are too young to contain paleontologically sensitive resources. Therefore, earthmoving activities in any of these sediments would result in no impacts on paleontological resources.

However, because of the number of recorded fossil sites in both the Riverbank and Modesto Formations within the Central Valley, they are considered paleontologically sensitive rock formations under SVP criteria. The discovery of Pleistocene vertebrate fossil remains in sediments referable to the Riverbank and Modesto Formations from Sutter and Sacramento Counties, as well as from Davis, Woodland, and numerous other areas

throughout the Central Valley, suggests the potential exists for uncovering additional similar fossil remains during construction-related deep excavation within portions of the Phase 4b Project area.

Both the Riverbank and Modesto Formations are located within the Phase 4b Project footprint. Certain construction-related activities in the Modesto Formation, such as enhancing levee embankments or forming berms on top of the existing ground surface, would not cause significant adverse impacts on paleontological resources because Pleistocene-age fossils would not be encountered until approximately 10 feet below the surface. However, excavations deeper than 10 feet would be required for installation of cutoff walls and relief wells. These improvements (and thus excavations deeper than 10 feet) would be constructed along the Sacramento River east levee, which is not in the Modesto Formation and thus is not expected to contain paleontologically sensitive formations. Cutoff walls would be installed in portions of the NEMDC, however, where the Riverbank Formation could occur. If the Riverbank Formation is encountered, unique paleontological resources could be damaged or destroyed; thus, this impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.9-a: Conduct Construction Personnel Training and, if Paleontological Resources are Found, Stop Work Near the Find and Implement Mitigation in Coordination with a Professional Paleontologist

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of construction activities in the Riverbank or Modesto Formations, construction personnel involved with earthmoving activities shall be informed by the project proponent(s) of the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction activities, and the proper notification procedures should fossils be encountered. This worker training may be either (1) prepared and presented by an experienced field archaeologist at the same time as construction worker education on cultural resources, or (2) prepared and presented separately by a qualified paleontologist.

If paleontological resources are discovered during earthmoving activities, the construction crew shall immediately stop work in the vicinity of the find. The project proponent(s) shall retain a qualified paleontologist to evaluate the resource and prepare a mitigation plan in accordance with SVP guidelines (1995). The mitigation plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations made by the paleontologist, in consultation with the project proponent, shall be implemented before construction activities can resume at the site where the paleontological resources were discovered.

Responsibility:	Project proponent(s)
Timing:	During earthmoving activities in the Riverbank or Modesto Formations as shown in **Plate 3-4**

Implementing this mitigation measure would reduce the impact to unique, scientifically-important paleontological resources discovered during construction or other earthmoving activities to a **less-than-significant** level. ***(Similar)***

4.9.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, no impacts would occur to paleontological resources. In the event of a levee failure under the No-Action Alternative, impacts would be less than significant.

With implementation of the mitigation measures described in this section, project implementation would not result in any residual significant impacts related to paleontological resources under the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative.

4.10 TRANSPORTATION AND CIRCULATION

4.10.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.10.1.1 METHODOLOGY

This section analyzes the potential impacts of the Phase 4b Project on traffic circulation and transportation systems and potential impacts related to emergency vehicle access and construction traffic hazards. Impacts on flight safety related to Airport operations are addressed in Section 4.16, "Hazards and Hazardous Materials."

Project operations would not increase vehicle trips. There would not be any operations-related impacts on transportation and circulation; therefore, operations-related impacts are not discussed further in this EIS/EIR. Consequently, this analysis is focused on temporary and short-term construction-related traffic and transportation-related impacts.

Instead of a traffic analysis focused on level of service, which is appropriate for projects that are confined within a specific, discrete area and/or when the exact project-related traffic routes are known, this analysis uses the traffic analysis methodology from the Institute of Transportation Engineers (ITE) (1989). This methodology is appropriate for this EIS/EIR because the exact traffic routes are not known, and construction activities would be dispersed over a wide area. ITE recommends using the following screening criterion for assessing the impacts of development projects that create permanent traffic increases: "In lieu of other locally preferred thresholds, a traffic access/impact study should be conducted whenever a proposed development will generate 100 or more added (new) peak-direction trips to or from the site during the adjacent roadway's peak hours or the development's peak hours." To account for the large percentage of heavy trucks associated with a large construction project, ITE recommends that the threshold level be reduced to 50 or more new peak-direction trips. For construction projects that create temporary and short-term traffic increases, this criterion is considered conservative by ITE (1989).

4.10.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) and alternatives under consideration were determined to result in a significant impact related to transportation and circulation if they would do any of the following:

- conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel, and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- substantially increase hazards due to a design feature or incompatible uses;
- result in inadequate emergency access; or

- conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

As noted above in Section 4.10.1.1, "Methodology," the traffic analysis in this EIS/EIR is not focused on level of service because the nature of the project does not lend itself to such an analysis (i.e., the exact traffic routes are not known and construction activities would be dispersed over a wide area). The Phase 4b Project was determined to result in a significant impact on traffic if the project would result in 50 or more new truck trips during the a.m. or p.m. peak hours.

The Phase 4b Project does not involve changes to air traffic patterns or other Airport operations that would affect air traffic patterns; therefore, this issue is not discussed further in this EIS/EIR.

The project would not permanently eliminate public transit, bicycle, or pedestrian corridors or facilities. In addition, the project would not include changes in nor would it conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. These issues are not discussed further in this EIS/EIR.

4.10.2 IMPACTS AND MITIGATION MEASURES

Impact 4.10-a: Temporary and Short-Term Increases in Traffic on Local Roadways

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to adversely affect traffic on local roadways. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Flooding of Natomas Basin roadways—Sacramento and Sutter County roadways, SR 99, I-5, and I-80—could be minor to extensive depending on the location and severity of the levee failure and the duration of flooding. Traffic rerouting could lead to minor to substantial traffic congestion on alternate roadways. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Project construction would result in substantial temporary and short-term increases in traffic on local roadways. Construction-related traffic would consist of daily commute trips by construction workers and truck trips to haul materials (especially borrow) and supplies from outside the project area, as well as truck trips to haul waste materials off-site for disposal. Section 3.10, "Transportation and Circulation," identifies the roadways in the project area (see **Table 3.10-1**) and includes the traffic count and level of service (LOS) data for these roadways, where available. **Plate 2-6** shows the anticipated haul routes that would be used during project construction.

Work Crew Commuting and Construction Staging Traffic

Personnel, equipment, and other imported construction materials would reach the Sacramento River east levee, American River north levee, and other Phase 4b Project construction sites via Bryte Bend Road, an off-road haul route parallel to the existing landside toe of the Sacramento River east levee, and a combination of roadways that

may include I-5, SR 99, Powerline Road, Del Paso Road, San Juan Road, El Centro Road, West El Camino Avenue, Truxel Road, Gateway Oaks Drive, Northgate Boulevard, Arden-Garden Connector, Elkhorn Boulevard, Riego Road, Sankey Road, Natomas Road, Pacific Avenue, Fifield Road, Keys Road, and Howsley Road.

The total construction crew size for the Sacramento River east levee improvements would reach up to 60 workers per shift working two shifts. The total crew size for the American River north levee improvements would also reach up to 60 workers per shift working two shifts. The total crew size for the NEMDC North improvements would reach up to 55 workers per shift working two shifts, and the total construction crew size for the PGCC levee raise would also reach up to 55 workers per shift working two shifts. Other Phase 4b Project improvements would involve a crew size of up to 125 workers per shift at sites throughout the Natomas Basin. Construction crew members would travel to different project sites in the Natomas Basin from different directions and by way of different sets of roadways and intersections. It is also likely that some ridesharing would take place and that trips would occur before and after peak hours. Therefore, traffic from construction crew commutes is unlikely to substantially affect local roadways, even during the peak a.m. and p.m. hours.

Haul Truck Traffic

Implementation of the Adjacent Levee Alternative (Proposed Action) would result in a substantial increase in traffic on local roadways associated with truck haul trips during construction activities. Haul routes proposed for transporting materials from borrow sites to construction areas are shown in **Plate 2-6**. **Table 4.10-1** shows the maximum anticipated haul trips by levee segment for the Adjacent Levee Alternative (Proposed Action) and the public roads that would potentially be affected.

Table 4.10-1
Phase 4b Project Haul Trips by Levee Segment

Levee Segment	Haul Trips Per Day	Public Road Haul Routes
Sacramento River east levee Reach A:16–19A	540	Del Paso and Powerline Roads (for West Lakeside School Site borrow use only), San Juan Road, and Bryte Bend Road
Sacramento River east levee Reach A:19B–20	360	Del Paso and Powerline Roads (for West Lakeside School Site borrow use only), San Juan Road, Bryte Bend Road; potential use of Garden Highway or other surface streets (Gateway Oaks Drive and West El Camino Avenue) to allow completion of round trips if landside off-road haul route can only provide single-lane of traffic
American River north levee Reach I:1–4	120	San Juan Road, El Centro Road, West El Camino Avenue, Truxel Road, and Northgate Boulevard
West levee of NEMDC North (Reaches F–G)	810	Howsley, Fifield, and Keys Roads; off-road haul route on landside levee toe
West levee of PGCC (Reach E)	566	Off-road haul route on landside levee toe

Source: Compiled by AECOM in 2010

Construction of the Sacramento River east levee and American River north levee improvements would require soil borrow material from the South Fisherman's Lake Borrow Area and the West Lakeside School Site. The Fisherman's Lake Borrow Area, previously analyzed as part of the Phase 4a Project (see Section 4.1.3, "Summary of Previous NEPA and CEQA Analyses of Borrow Sites"), could provide additional borrow material for these improvements if needed. The proposed Triangle Properties Borrow Area would be the primary source of borrow material for levee improvements along the PGCC and NEMDC North, and the Krumenacher Borrow Site and Twin Rivers Unified School District Stockpile Site (adjacent to the NEMDC west levee south of Elkhorn Boulevard) could be back-up sources of borrow material for improvements to NEMDC North.

The improvements to the Sacramento River east levee (Reach A:16–20) would involve haul trucks carrying soil borrow material from the South Fisherman's Lake Borrow Area, primarily on Bryte Bend Road to an off-road haul route that would be constructed at the landside toe of the levee to allow haul trucks to deliver material to construction sites along the levee. Hauling from the West Lakeside School Site to the Sacramento River east levee (Reach A:16–20) would also use off-road haul routes to connect to the on-road haul routes shown on **Plate 2-6**. The primary corridors where construction activity would take place are off of public roadways, within and through the soil borrow areas, and within the adjacent levee alignment and dirt roads used for access to work areas. For Sacramento River east levee Reach A:19B–20 (between Marina Glen Way and Gateway Oaks Drive), a single lane of Garden Highway may be needed to complete haul trips because landside space may be too limited to provide a two-lane, two-way, off-road haul route. As an alternative to using one lane of Garden Highway, trucks could complete haul trips by using surface streets on the landside of the levee, including Gateway Oaks Drive and West El Camino Avenue.

Because the Triangle Properties Borrow Area, the Krumenacher Borrow Site, and the Twin Rivers Unified School District Stockpile Site are located close to construction sites along the west levees of the PGCC and NEMDC, borrow material would primarily be transported on the off-road haul routes shown on **Plate 2-6** or moved overland via scrapers. Hauling from the Triangle Properties Borrow Area would use Howsley, Fifield, or Keys Roads, or a combination of these roads.

As shown in **Table 4.10-1**, haul trips for borrow material for the Sacramento River east levee (Reach A:16–20) would total up to 900 trips per day during the 156-day construction season. These trips would be divided between approximately 540 trips per day for Reach A:16–19A, and approximately 360 trips per day for Reach A:19B–20. Borrow material haul trips are anticipated to be approximately 120 trips per day for the American River north levee improvements (Reach I:1–4). Haul trips for borrow material for improvements to the west levees of the PGCC and NEMDC North would be up to 566 and 810 trips per day, respectively, with most trips taking place on the off-road haul route between the Krumenacher Borrow Site and the Triangle Properties Borrow Area (see **Plate 2-6**). A portion of the Phase 4a Project construction (Sacramento River east levee Reach B:13–15) could overlap with the Sacramento River east levee portion of the Phase 4b Project during the 2012 construction season. Some overlap of haul trips between these two project phases could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other's traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site (see **Plate 2-6**).

Road Closures

In addition to delays caused by increases in traffic on local roadways related to construction activity, temporary and short-term road closures would be required to accommodate construction activities in the Phase 4b Project area. In Reach A:16–19A of the Sacramento River east levee, the landside lane of Garden Highway could be closed for up to 6 months to allow for construction of a cutoff wall. Through traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. The closed portion of Garden Highway would shift along the levee crown as the cutoff wall is installed. In Reach A:19B–20 of the Sacramento River east levee, the landside lane of Garden Highway could also be closed for up to 6 months to allow for construction of a cutoff wall. In addition, because there may be inadequate room for a two-way haul route at the toe of the existing levee, surface streets may be used to allow completion of round trips by haul trucks traveling to and from the South Fisherman's Lake Borrow Area and/or West Lakeside School Site. These surface street routes would either be Gateway Oaks Drive and West El Camino Road, or the waterside lane of Garden Highway. If the waterside lane of Garden Highway is used, it would only be open to local traffic. In addition, Garden Highway would be temporarily closed for up to 30 days at several locations (including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B) to allow for the installation of pipes.

For the proposed the levee raise in Reach B:12B–13 (Station 662+00 to Station 680+00), Garden Highway would be closed for up to two months. However, access to waterside residences in this reach would be maintained at all times.

For levee improvements along the American River north levee (Reach I:1–4), all lanes of the portion of the Garden Highway/Arden-Garden Connector between I-5 and Northgate Boulevard would be completely closed for up to 6 months. Through-traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard.

Remediation of the SR 99 bridge over the NCC would entail construction of a removable barrier system, requiring lane closures and traffic controls. The northbound and southbound lanes of the NCC bridge would be closed for at least 2 weeks (1 week for each direction), and a total of up to 5 weeks to allow for set-up and take down of traffic controls and traffic bypasses. Traffic control would include a cross-median detour to route southbound travel to the northbound bridge, which would be divided to allow one lane of travel in each direction. After the cutoff wall is installed and cured through the southbound lanes, the traffic detour would be reconstructed to route northbound traffic to the southbound bridge for installation of the cutoff wall through the northbound roadway.

In summary, these road closures, lane closures, and traffic controls would cause or contribute to temporary and short-term substantial increases in traffic levels on West El Camino Avenue, SR 160, Richards Boulevard, Gateway Oaks Drive, and SR 99 as traffic is detoured or slowed. In addition, these closures and traffic controls could cause traffic delays during the a.m. and p.m. peak commute hours.

Impact Summary

Traffic associated with the movement of equipment, construction materials, and construction personnel would involve travel to different project sites in the Natomas Basin from different directions and by way of different sets of roadways and intersections. Therefore, this traffic is unlikely to substantially affect local roadways, even during the peak a.m. and p.m. hours.

Implementation of the Adjacent Levee Alternative (Proposed Action) would result in a substantial increase in traffic on local roadways associated with truck haul trips during construction activities. In addition, road closures, lane closures, and traffic controls would cause or contribute to temporary substantial increases in traffic levels on several project area roadways as traffic is detoured or slowed, and these closures and traffic controls could cause traffic delays during the a.m. and p.m. peak commute hours. Specifically, increases in traffic would be caused both by the closure of Garden Highway and the Arden-Garden Connector (shifting Garden Highway traffic to nearby surface streets), and by the use of major surface streets (e.g., San Juan Road, West El Camino Avenue, Truxel Road, and Northgate Boulevard) by haul truck traffic. Compared to other local roads in the Natomas Basin, Garden Highway is a primary route for residents traveling to and from their homes. Overall, project construction would result in a substantial temporary and short-term increase in traffic on local roadways, and these temporary and short-term impacts are considered **significant**.

Fix-in-Place Alternative

Under the Fix-in-Place Alternative, construction-related trips would be the same as for all elements described for the Adjacent Levee Alternative (Proposed Action), except that haul trips associated with the Sacramento River east levee improvements would be approximately 7% greater than the Adjacent Levee Alternative (Proposed Action) (960 haul trips per day under this alterative compared to 900 trips per day under the Adjacent Levee Alternative [Proposed Action]). Upgrading the existing Sacramento River east levee in place under the Fix-in-Place Alternative would require the closure of both lanes of Garden Highway in an approximately 1,000-foot-long segment that would move along the levee as construction is completed for up to 6 months. Local access for homeowners would be provided, while through-traffic would be detoured around the construction area.
The closure of Garden Highway would cause traffic and access delays on local roadways. In addition, because the levee would be widened 15 feet less than under the Adjacent Levee Alternative (Proposed Action), it is assumed that the landside off-road haul route could support two-way haul truck traffic, and local surface streets (Garden Highway or Gateway Oaks Drive/West El Camino Avenue) would not be needed to complete round trips.

As described above for the Adjacent Levee Alternative (Proposed Action), Garden Highway would be temporarily closed for up to 30 days at several locations (including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B) to allow for the installation of pipes. Also, for levee improvements along the American River north levee (Reach I:1–4), all lanes of a portion of Garden Highway/Arden-Garden Connector would be completely closed for up to 6 months between I-5 and Northgate Boulevard.

Compared to other local roads in the Natomas Basin, Garden Highway is a primary route for residents traveling to and from their homes. The prolonged closures that would be required to upgrade the levee in place and construct cutoff walls would result in substantial traffic and access delays. In addition, because the levee would be widened 15 feet less than under the Adjacent Levee Alternative (Proposed Action), it is assumed that the landside off-road haul route could support two-way haul truck traffic, and local surface streets (Garden Highway or Gateway Oaks Drive/West El Camino Avenue) would not be needed to complete round trips. Overall, traffic impacts would be similar to the Adjacent Levee Alternative (Proposed Action), and this impact is considered **significant**. ***(Similar)***

Mitigation Measure 4.10-a: Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of construction in each construction season, the project proponent(s) and primary contractors for engineering and construction shall develop a coordinated construction traffic safety and control plan to minimize the simultaneous use of roadways by different construction contractors for material hauling and equipment delivery to the extent feasible and to avoid and minimize potential traffic hazards on local roadways during construction. Upon selection of borrow sites within the Phase 4b Project area, the traffic safety and control plan shall reflect affected roadways. Items (a) through (e) of this mitigation measure, as listed below, shall be integrated as terms of the construction contracts.

(a) The plan shall outline phasing of activities and the use of multiple routes to and from off-site locations to minimize the daily amount of traffic on individual roadways. The project proponent(s) shall ensure that the construction contractors enforce the plans throughout the construction periods.

(b) The construction contractors shall develop a traffic safety and control plan for the local roadways that would be affected by construction traffic. Before the initiation of construction-related activity involving high volumes of traffic, the plan shall be submitted for review by Caltrans and the agencies of the local jurisdictions (Sutter County, Sacramento County, and/or City of Sacramento) having responsibility for roadway safety at and between project sites. The plan shall call for the following elements:

- posting warnings about the potential presence of slow-moving vehicles;
- using traffic control personnel when appropriate; and
- placing and maintaining barriers and installing traffic control devices necessary for safety, as specified in Caltrans's *Manual of Traffic Controls for Construction and Maintenance Works Zones* and in accordance with city/county requirements (Caltrans 1996).

The contractor shall train construction personnel in appropriate safety measures as described in the plan and shall implement the plan. The plan shall include the prescribed locations for staging equipment and parking trucks and vehicles. Provisions shall be made for overnight parking of haul trucks to avoid causing traffic or circulation congestion.

(c) Consistent with Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction," the track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventive measures. Tracked-out materials shall be removed within 1 hour from adjacent streets anytime such material track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations. All visible roadway dust tracked out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a HEPA filter equipped vacuum device shall be used for roadway dust removal.

(d) A Transportation Management Plan shall be prepared and submitted to Caltrans District 3 to address any points of access from the state highway system for haul trucks and other construction equipment, and traffic control as a result of construction activities at the SR 99 NCC bridge.

(e) Before the start of the first construction season, the project proponent(s) shall coordinate with Sutter and Sacramento Counties and the City of Sacramento to address maintenance and repair of affected roadways resulting from increased truck traffic.

(f) Before project construction begins, the project proponent(s) shall provide notification of project construction to all appropriate emergency service providers in Sutter County, Sacramento County, and/or the City of Sacramento, and shall coordinate with providers throughout the construction period to ensure that emergency access through construction areas is maintained.

(g) Before the start of construction, the project proponent(s) and primary contractors shall coordinate with Sacramento County and the City of Sacramento regarding any closures of Garden Highway and associated detours.

Responsibility:	Project proponent(s) and construction contractors for all measures, except noticing for which SAFCA would be responsible
Timing:	Prepare the traffic safety and control plan, create of off-road haul routes, and notify emergency service providers before the start of project construction; remove tracked-out materials during construction
Enforcement:	Caltrans and City and County agencies

Implementation of this mitigation measure would reduce the impact, but not to a less-than-significant level. Given the high amount of hauling required for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, and the limited number of roadways in the project vicinity that would be suitable for hauling between borrow sites and project construction sites, it is possible that the volume of traffic during some periods may still exceed ITE thresholds despite the implementation of this measure. Because no other feasible mitigation measures are available to fully reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable**.

The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would require the temporary closure of Garden Highway. Even with implementation of this mitigation measure, there are no feasible mitigation measures available to fully reduce the impacts from the temporary and short-term closure of Garden Highway; therefore, these temporary and short-term impacts would remain **significant and unavoidable**. ***(Similar)***

Impact 4.10-b: Temporary and Short-Term Increases in Traffic Hazards on Local Roadways

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to temporarily increase traffic hazards. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. If any part of the levee system were to fail, flooding of Natomas Basin roadways—Sacramento and Sutter County roadways, SR 99, I-5, and I-80—could be minor to extensive depending on the location and severity of the failure and the duration of flooding and associated traffic hazards could be minor to severe. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)*** Without improvements to the Natomas perimeter levee system, the risk of levee failure would remain high.

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

During project construction along the Sacramento River east levee (Reach A:16–20), Garden Highway intersections at Orchard Lane and up to 20 private parcel ramps would be reconstructed to accommodate the adjacent levee. In addition, along the American River north levee, Garden Highway intersections at Natomas Park Drive, Truxel Road, Arden-Garden Connector, Northgate Boulevard, and four private parcel ramps would require degrading, embankment rebuilding, and repaving to accommodate levee improvements. The design of the intersections would meet Sacramento County or City of Sacramento roadway design criteria.

As described under Impact 4.10-a, high volumes of slow-moving truck traffic could be associated with the construction activities on Phase 4b Project roadways. Under the Fix-in-Place Alternative, haul trips associated with the Sacramento River east levee improvements would be approximately 7% greater than the Adjacent Levee Alternative (Proposed Action), and the levee would be widened 15 feet less than under the Adjacent Levee Alternative (Proposed Action). Therefore, it is assumed that the landside off-road haul route could support two-way haul truck traffic, and local surface streets (Garden Highway or Gateway Oaks Drive/West El Camino Avenue) would not be needed to complete round trips under the Fix-in-Place Alternative.

Construction workers entering and exiting construction areas at the beginning and end of work shifts could also increase traffic hazards. In addition, trucks and other vehicles could track mud and gravel onto the local roadways, potentially posing driving hazards.

Pavement sections on the rural Sacramento County, Sutter County, and some City of Sacramento roadways in the project area were designed to carry low-volume traffic. The high-volume truck traffic anticipated during Phase 4b Project construction would accelerate wear and tear on a section of Howsley Road, Fifield Road, and Keys Road at the Triangle Properties Borrow Area and on Powerline Road, El Centro Road, San Juan Road, West El Camino Avenue, Truxel Road, Northgate Boulevard, and Gateway Oaks Drive in south Natomas. Besides shortening the life of pavement sections, high-volume truck traffic could cause road damage, such as cracks and potholes, which could create road hazards for other motorists.

The combination of the high volume of slow-moving truck traffic, potentially tracking mud and debris onto roadways; workers entering and exiting construction sites; periodic road and lane closures associated with levee

improvements; and potential damage to pavement would increase traffic hazards on local roadways during the construction period. This impact is considered **significant**. ***(Similar)***

Mitigation Measure 4.10-b: Implement Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	The project proponent(s) and its primary contractors for engineering design and construction shall implement Mitigation Measure 4.10-a, above.	
	Responsibility:	Project proponent(s) and construction contractors for all measures, except noticing in which SAFCA would be responsible
	Timing:	Before the start of project construction
	Enforcement:	Caltrans and City and County agencies

Implementing this mitigation measure would require the project proponent(s) prepare and implement a traffic safety plan, and would coordinate with the construction contractors and local and regional agencies regarding the distribution of traffic along haul routes and establishing alternative traffic routes. However, implementation of this mitigation measure may not fully reduce the impact to a less than significant because of the volume of trucks and construction traffic that would occur. Therefore, this impact would remain **potentially significant and unavoidable**. ***(Similar)***

Impact 4.10-c: Temporary and Short-Term Disruption of Emergency Service Response Times and Access

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to directly disturb emergency service response times and access. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. A levee failure along the NCC or the Sacramento River east levee could result in minor to substantial flooding of the Natomas Basin, including the Airport, I-5 and I-80, and SR 99, as well as local roadways, which would result in a minor to substantial disruption of emergency service and response times. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related effect on traffic and circulation and emergency service response cannot be estimated. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative could delay emergency service response times because of the difficulty of emergency vehicles needing to pass through or near construction areas as discussed under Impacts 4.10-a and 4.10-b, above.

The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would increase traffic on local roadways associated with construction trips. In addition, temporary and short-term road closures associated with levee improvements could cause or contribute to temporary and short-term increases in traffic levels as traffic is detoured or slowed on some local roadways, SR 160, and SR 99. Increased traffic congestion could interfere with the use of main roadways for emergency evacuation routes. Garden Highway is the primary access for homes and businesses located on the waterside of the levee. Temporary and short-term construction closures, including an approximately 6-month closure of the landside lane of Garden Highway in Reach A:16–20 to allow for construction of a cutoff wall, would interfere with emergency access to these residences and businesses (see also Section 4.3, "Land Use, Socioeconomics, and Population and Housing"). In addition, Garden Highway would be temporarily closed for up to 30 days at several locations (including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B) to allow for the installation of pipes. Levee improvements along the American River north levee (Reach I:1–4) would require the closure of all lanes of a portion of Garden Highway/ Arden-Garden Connector for up to 6 months, and the SR 99 NCC bridge remediation would involve lane closures for a period of up to 5 weeks as described in Impact 4.10-a.

Closures of Garden Highway would be required with traffic controls to maintain local access; however, delays in emergency service response times may still result. Because the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative could result in delays in emergency service response times, this impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.10-c: Implement Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-related Truck Trips"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	The project proponent(s) and primary contractors for engineering design and construction shall implement Mitigation Measure 4.10-a, above.	
	Responsibility:	Project proponent(s) and construction contractors for all measures, except noticing for which SAFCA would be responsible
	Timing:	Before the start of project construction
	Enforcement:	Caltrans and City and County agencies

Implementing this mitigation measure would reduce the temporary and short-term impacts on emergency service response times and access to a **less-than-significant** level because before project construction begins, the project proponent(s) would provide notification of project construction to all appropriate emergency service providers in Sutter County, Sacramento County, and/or the City of Sacramento and would coordinate with providers throughout the construction period to ensure that emergency access through construction areas is maintained. ***(Similar)***

Impact 4.10-d: Conflict with Adopted Policies, Plans, or Programs Supporting Alternative Transportation

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to conflict with adopted policies, or programs supporting alternative transportation, or to prevent use of project roadways by alternative modes of transportation. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. If any part of the levee system were to fail, flooding of Natomas Basin roadways could be minor to extensive depending on the location and severity of the failure and the duration of flooding, and associated effects on alternative modes of transportation could be minor to severe. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Sacramento County Department of Transportation is in the process of updating the Sacramento County Bikeway Master Plan (Klinker, pers. comm., 2009). Several designated Class I (off-street), Class II (on-street with lane markings), or Class III (designated on-street) bicycle routes are within the Phase 4b Project area. Future bicycle routes are planned in the area; a Class I off-street trail is planned along Garden Highway and on-street Class II routes are planned for several roadways including Powerline Road, Del Paso Boulevard, and Elkhorn Boulevard (City of Sacramento 2005:3.3-3). Implementation of the Phase 4b Project would not preclude future development of alternative transportation corridors or facilities (e.g., bike paths, lanes, bus turnouts) in the project area.

Bicycle use of roadways in the Phase 4b Project area occurs on roadways without bikeway designations. The Sacramento Area Bicycle Advocates have noted that Garden Highway is used extensively by recreational cyclists and increasingly by commuters (SAFCA 2009). Construction of levee improvements would temporarily require partial (Adjacent Levee Alternative [Proposed Action]) or full closure (Fix-in-Place Alternative) of Garden Highway, requiring bicyclists to use alternative routes or alternate modes of transportation. Additionally, the Sacramento County General Plan Circulation Element notes that routes used extensively for truck hauling have increased hazards for bicycles (Sacramento County 1993). Proposed on-road haul routes, as shown in **Plate 2-6**, include Powerline Road, Del Paso Road, El Centro Road, San Juan Road, West El Camino Road, Gateway Oaks Drive, Truxel Road, and Northgate Boulevard. Bike trails located along the NEMDC levees are also located in the Phase 4b Project area. Bicyclists using these routes would be exposed to increased hazards during construction. The potential increase in hazards for bicyclists using the Phase 4b Project area roadways and bike trails would be a temporary and short-term construction-related **significant impact**. ***(Similar)***

Mitigation Measure 4.10-d: Prepare and Implement a Bicycle Detour Plan for Project Area Roadways and Bike Trails, Including Garden Highway and the NEMDC Levees

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Before the start of construction, the project proponent(s) or and primary contractors shall prepare a bicycle detour plan for roadways and bike trails that would be affected by project construction activities, including Garden Highway and NEMDC levees, in consultation with the County Alternative Modes Coordinator and/or City of Sacramento Bicycle and Pedestrian Coordinator, as applicable. The detour plan shall include posted signs clearly indicating closure points, truck haul routes, detour routes, and informational signs to notify motorists and bicyclists to share the roads. Signs shall be posted outside of the immediate project area in order to notify bicyclists of closure points and detours. The detour plan shall be in place before the start of construction, and shall be maintained and implemented throughout the construction period.

Responsibility:	Project proponent(s) and construction contractors
Timing:	Before the start of project construction
Enforcement:	Caltrans, and City and County agencies

Implementing this mitigation measure would reduce the temporary and short-term impacts from construction-related disruption to bicycle facilities under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-significant** level because construction-related damage would be repaired, access restored, and detour routes, roadway markings to designate temporary bike lanes, and informational signs would be provided. ***(Similar)***

4.10.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, impacts due to disruption of traffic circulation, traffic hazards, emergency service response times, bikeway conflicts, and access in the event of levee failure are uncertain. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Implementation of Mitigation Measure 4.10-a under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would not fully reduce the impacts created from the temporary and short-term increases in traffic levels from haul trucks during construction to a less-than-significant level because the volume of traffic during some periods may still exceed ITE thresholds; therefore, a residual significant impact would occur.

Impacts related to the temporary and short-term disruption of emergency service response times and access would be reduced to a less-than-significant level under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because emergency service providers would be notified before project construction begins.

Implementation of Mitigation Measure 4.10-a under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would not fully reduce traffic hazard impacts from temporary and short-term traffic increases to a less-than-significant level because of the high volume of slow-moving trucks and construction traffic that would occur; therefore, a residual significant impact would occur. Implementation of Mitigation Measure 4.10-d under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would reduce temporary and short-term bikeway impacts to a less-than-significant level because a bicycle detour plan would be prepared and implemented.

4.11 AIR QUALITY

4.11.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.11.1.1 METHODOLOGY

All increased pollutant emissions associated with the Phase 4b Project would be generated by construction-related activities. Construction emissions are described as temporary, but because of the multi-year construction schedule, these emissions are also considered to be "short-term" in duration. These temporary and short-term emissions, especially emissions of criteria air pollutants (i.e., respirable particulate matter less than 10 microns in diameter [PM_{10}]) and ozone precursors (e.g., reactive organic gases [ROG] and oxides of nitrogen [NO_X]), have the potential to represent a significant air quality impact.

The method of analysis for short-term (temporary) construction-related, mobile-source emissions is consistent with the recommendations of the Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Feather River Air Quality Management District (FRAQMD). The Phase 4b Project would not result in operational emissions; therefore, long-term regional (operational) emissions were not estimated.

Project implementation would not result in any major sources of odor, and the Phase 4b Project would not involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, coffee roaster, wastewater treatment facility). Diesel exhaust, which is sometimes considered an objectionable odor source, would be associated with the use of on-site construction equipment, but it would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Thus, project implementation would not expose sensitive receptors to odorous emissions, and this issue is not discussed further in this EIS/EIR.

Project construction would generate emissions of diesel PM (DPM), which is identified by the California Air Resources Board (ARB) as a toxic air contaminant (TAC). Emissions of DPM have been related to long term health impacts including non-cancer chronic hazards and increased cancer risk. Mobile sources of DPM are largely regulated under California State programs, separately from stationary equipment. However, DPM emissions will result in short-term, temporary impacts and would not result in a long-term cancer risk to residential or worker receptors.

The following construction sources and activities were analyzed for emissions:

- Exhaust emissions from on- and off-road construction equipment, haul trucks, and employee commuter trips (all pollutants), based on estimated equipment schedules, and emission factors developed in SMAQMD's Road Construction Emissions Model, Version 6.3.2.

- Fugitive dust emissions from on-site and off-site haul truck trips on paved and unpaved roads; fugitive dust emissions from material handling activities including haul truck unloading, scraper unloading, and bulldozer activity, based on estimated vehicle miles traveled, material loading (in tons per day), hours of operation, and Chapter 11 and 13 of EPA's Compilation of Air Pollutant Factors (AP-42).

On- and Off-road Construction Equipment Emissions

Construction emissions were estimated using the Road Construction Emissions Model, Version 6.3.2, developed by SMAQMD for use in developing emissions inventories for CEQA projects. The Road Construction Emissions Model is derived from the CARB OFFROAD 2007 model (developed for off-road construction equipment emissions) and the CARB EMFAC 2007 model (developed for on-road vehicle emission). Emissions estimates for off-road construction equipment were based on 2010–2013 fleet mix averages, as provided by SMAQMD's Road Construction Emissions Model, to provide conservative emissions estimates. Annual emissions for each

year of construction were estimated from appropriate emission factors, number of equipment, and activity periods as provided in Chapter 2, "Alternatives."

Emission factors are based on one 8-hour work shift per day. Specific construction activities such as cutoff wall installation and road construction could occur 24 hours per day, 7 days per week (24/7). This analysis estimates emissions for 24/7 activities by multiplying the daily emission factors developed for one 8-hour shift per day by a factor of 3.0. Similarly, some construction activities could occur for 10–12 hours per day. Emission estimates for 10–12 hour activities multiply the emission factor developed for one 8-hour shift per day by 1.25 and 1.5, respectively. All activities that could occur for more than an 8-hour shift per day have been noted in the modeling analysis, provided in **Appendix F**.

Fugitive Dust Emissions

Fugitive dust emissions are associated primarily with site preparation and excavation of borrow material and vary as a function of conditional parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled on- and off-site. As noted above, fugitive dust emissions from construction equipment, haul trucks, and material handling were estimated using EPA AP-42 emission factors.

The Triangle Properties Borrow Area in Sutter County is the assumed primary source of soil borrow material for improvements along the west levees of the PGCC and NEMDC North. The Krumenacher borrow site and Twin Rivers Unified School District stockpile site in Sacramento County are the assumed primary sources of soil borrow material for improvements along NEMDC South. The South Fisherman's Lake Borrow Area and West Lakeside School Site would be the primary sources of soil borrow material used for levee improvements along Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4. For modeling purposes and to capture worst- case impacts under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, it was assumed that borrow and fill material would be transported an average of approximately 4 miles round trip on 50% paved and 50% unpaved haul routes; haul routes are shown on **Plate 2-6**.

The Phase 4b Project is proposed to be constructed in 2012–2016, with almost all of the construction activities during the 6–8-month construction season, which typically starts in May and runs through November. In some cases, work may begin in early April and extend as late as December 31. However, for purposes of modeling emissions for this EIS/EIR, it has been assumed that the construction season would be May through November.

Phase 4b Project components would be constructed in one or two construction seasons, depending upon the amount of construction involved. Major levee improvements could span two construction seasons, while more discrete improvements, such as pumping plant modifications, could be completed in a single construction season. **Table 4.11-1** shows the timing of construction activities for the Phase 4b Project components that were assumed for modeling emissions across the 2012–2016 construction seasons.

Construction emissions from the proposed Phase 4b Project were estimated based on the construction schedule provided in **Table 4.11-1**. To ensure that worst case air quality impacts were captured, emissions estimates include both those from Phase 4b construction activities and those that would be produced by construction of components analyzed as part of previous phases that would occur during the 2012 construction season. Phase 4a Project construction that would occur during the Phase 4b Project construction period would include Sacramento River east levee Reach B:13–15 and all of the relocation of the Riverside Canal, as discussed in Chapter 2, "Alternatives." For the PGCC west levee, the levee raise analyzed as part of the Phase 3 Project would be constructed as part of the levee raise addressed in the Phase 4b Project. Therefore, air quality emissions for overlapping construction on the PGCC (Phase 3 Project) are equivalent to the emissions estimated for the PGCC component of the Phase 4b Project. Construction activities associated with the "No-Action Alternative–Implementation of Phase 1, 2, 3, and 4a Projects Only" are summarized in Section 2.2.2.

Table 4.11-1
Construction Schedule for the Adjacent Levee Alternative's (Proposed Action's) Major Project Components

Major Project Component	Construction Season (May–November)				
	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)
Phase 3 Project – Overlapping Components					
NEMDC South – Cutoff Wall	-	-	-	100	-
Phase 4a Project – Overlapping Components					
Sacramento River east levee Reach A:13–15	100	-	-	-	-
Riverside Canal	100	-	-	-	-
Phase 4b Project – All Components					
Sacramento River east levee Reach A:16–20	-	50	50	-	-
American River north levee Reach 1:1–4	50	50	-	-	-
NEMDC North (Reaches F–G) levee raising	-	-	-	-	100
PGCC and NEMDC South (Reaches E and H) levee raising	-	-	-	100	-
PGCC and NEMDC South (Reaches E and H) waterside improvements	-	-	-	100	-
PGCC culvert remediation	-	-	100	-	-
SR 99 NCC Bridge remediation	100	-	-	-	-
West Drainage Canal	-	100	-	-	-
Riego Road Canal relocation	-	-	100	-	-
NCC south levee ditch relocations	100	-	-	-	-
RD 1000 Pumping Plant modifications	-	-	-	100	-
City of Sacramento Pumping Plant modifications	-	100	-	-	-
South Fisherman's Lake Borrow Area and West Lakeside School Site excavation and reclamation	-	-	100	-	-
Triangle Properties Borrow Site excavation and reclamation	-	-	100	-	-

Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; SR = State Route
Source: Data compiled by AECOM in 2010

Project-related emissions are estimated within the air districts that regulate them using the applicable mass emission thresholds for regional impact analysis. The Phase 4a Project components that would overlap into the Phase 4b Project (in the 2012 construction season) are located within Sacramento County.

4.11.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to air quality if they would do any of the following:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of a criteria air pollutants for which the project region is nonattainment under any applicable Federal or state ambient air quality standards (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- result in exposure of sensitive receptors to substantial concentrations of toxic air emissions or criteria air pollutants;
- create objectionable odors affecting a substantial number of people;
- generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The Phase 4b Project's potential impacts related to greenhouse gas emissions are discussed in Chapter 5, "Cumulative and Growth-inducing Impacts, and Other Statutory Requirements," under Section 5.1.5.12, "Climate Change."As stated in Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management districts or air pollution control district may be relied upon to make the above determinations. Thus, the appropriate district-recommended emission thresholds as published in their respective CEQA guidance documents also applies to individual projects under their jurisdiction.

For levee improvements conducted in Sutter County, the FRAQMD *Draft Indirect Source Review Guidelines* and CEQA planning guidance (FRAQMD 2010) provide recommended thresholds of significance for Type 2 projects, or projects such as levee improvements that do not include an operational phase. An air quality impact was considered significant if implementation of the Adjacent Levee Alternative (Proposed Action) or alternatives under consideration would result in project construction emissions that exceed:

- 25 lb/day and 4.5 tons per year of ROG,
- 25 lb/day and 4.5 tons per year of NO_X, and
- 80 lb/day of PM_{10}.

For portions of the project that would occur in Sacramento County, based on SMAQMD's *Guide to Air Quality Assessment in Sacramento County* (SMAQMD 2004), an air quality impact was considered significant if implementation of the Adjacent Levee Alternative (Proposed Action) or alternatives under consideration would do any of the following:

- generate construction-related emissions of criteria air pollutants or precursors that exceed the SMAQMD-recommended threshold of 85 pounds per day (lb/day) for NO_X, or result in or substantially contribute (at a level equal to or greater than 5%) to emissions concentrations that exceed the national ambient air quality standards (NAAQS) or California ambient air quality standards (CAAQS) for any criteria pollutant; or
- generate long-term (operational) regional criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NO_X, or result in or substantially contribute (at a level equal to or greater than 5%) to emissions concentrations that exceed the NAAQS or CAAQS for any criteria pollutant.

General Conformity requirements under the Code of Federal Regulation (CFR) 40 Part 93 require Federally funded projects to demonstrate conformance with applicable air quality planning efforts as specified under the

Clean Air Act. Conformity may be demonstrated if estimated project emissions are below the *de minimus* thresholds presented below:

- For construction emissions within the Sacramento Metropolitan Nonattainment Area:
  - 25 TPY of ROG,
  - 25 TPY of NO_X, or
  - 100 TPY of PM_{10}.

Project emissions in excess of the *de minimus* thresholds may choose to fully offset project impacts through a Federal and State enforceable offset program that has gone through the SIP approval process.

4.11.2 IMPACTS AND MITIGATION MEASURES

Impact 4.11-a: Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} During Construction

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no potential exists for project-related construction emissions. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Cleanup actions in the event of levee failure would likely require the use of construction equipment that would emit air quality pollutants. The amount and types of pollutants cannot be predicted and would depend on the magnitude of cleanup operations. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered to **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

The Adjacent Levee Alternative (Proposed Action) would result in the temporary and short-term generation of ROG, NO_X, and PM_{10} emissions from excavation, material handling, vegetation clearing, grading, cut-fill, concrete placement, asphalt paving, motor vehicle exhaust associated with construction equipment, construction employee commute trips, material transport (especially on unpaved surfaces), material handling and other construction activities associated with construction of the Phase 4b Project, including excavation and reclamation in the borrow areas listed in **Table 2-23** and shown on **Plate 2-6**. Routes used for modeling haul truck trip emissions are shown on **Plate 2-6**. See Section 4.11.1.1, "Methodology," above, for assumptions used in estimating the emissions that would be generated as a result of the Phase 4b Project and assumptions for borrow and hauling.

Improvements constructed within Sutter County would be regulated under FRAQMD jurisdiction; improvements constructed within Sacramento County would be regulated under SMAQMD jurisdiction. Impacts from activities proposed to occur in both counties have been analyzed based on the approximate distance (in linear feet) proposed to occur in each county.

Worst-case daily and annual construction emissions were calculated based on the assumptions described in Section 4.11.1.1, "Methodology," above, for completion of the 2012–2016 construction seasons. Results of the peak daily and annual emissions are shown in **Tables 4.11-2a**, **4.11-2b**, and **4.11-5**.

Conservative assumptions were made for construction activities associated with all improvements that would occur under the Phase 4b Project. Construction activities associated with components of the Phase 3 and 4a Projects could overlap proposed activities during construction of the Phase 4b Project. Therefore, emissions calculations summarized in **Tables 4.11-2a** and **4.11-2b** represent worst-case daily emissions that could occur associated with construction of the Phase 4a Project (100% of Sacramento River east levee Reach B:13–15 and 100% of relocation of the Riverside Canal in 2012) and construction of 4b Project elements that would occur in 2012–2016. See **Appendix F** for detailed emission sources and assumptions. Based on the project information presented in Chapter 2, "Alternatives," construction of the Adjacent Levee Alternative (Proposed Action) would result in maximum unmitigated daily emissions in excess of applicable FRAQMD thresholds for NO_X and PM_{10} and SMAQMD thresholds for NO_X. Because of the large size of the project, large construction area, and high intensity of construction activities to be conducted concurrently, as well as the existing nonattainment status of the project area, and based on the modeling conducted, it is foreseeable that unmitigated construction-generated emissions could result in or substantially contribute to a violation of air quality standards.

SMAQMD does not have an adopted mass emission-based threshold for PM_{10}. Instead, SMAQMD relies on a concentration-based threshold equivalent to the ambient air quality standard for PM_{10}. SMAQMD's 2009 CEQA Guide requires proposed projects to quantify and discuss mass emissions and evaluate them based on the potential for exceedance above the national ambient air quality concentration based thresholds. For PM_{10} emissions, the SMAQMD's CEQA Guide allows for enhanced PM_{10} Dust Control Practices to be proposed and implemented at the proposed project site for quantifiable emissions reductions. The Phase 4b Project has developed a comprehensive Fugitive Dust Control Plan in compliance with the guidelines that will effectively reduce mass PM_{10} emissions below the concentration based threshold.

If construction activities would result in or substantially contribute to a violation of the standard at or beyond the project bonndary, then construction-generated emissions of PM_{10} would be significant. Because of the intensity of earthmoving activities that would be involved during the construction of the Sacramento River east levee and American River north levee improvements, the PGCC culvert remediation work, the West Drainage Canal remediation, and the PGCC/NEMDC South Levee raise work, it is likely that unmitigated emissions could substantially contribute to a violation of the applicable air quality standard.

As shown in **Tables 4.11-2a** and **4.11-2b,** with implementation of the FRAQMD- and SMAQMD-recommended Fugitive Dust Control Plan(s), payment into off-site mitigation plans, and other proposed mitigation measures, the Adjacent Levee Alternative (Proposed Action) would result in temporary and short-term construction-related emissions that are less than significant for PM_{10} and $PM_{2.5}$, and that are below the applicable mass emissions thresholds for NO_X and ROG; therefore, the Adjacent Levee Alternative (Proposed Action) would not result in a direct, temporary or short-term adverse effect on air quality. This impact is considered **significant**.

Fix-in-Place Alternative

As with the Adjacent Levee Alternative (Proposed Action), worst-case daily and annual construction emissions that would occur under the Fix-in-Place Alternative would come primarily from earthmoving activities associated with the levee construction phase. Emissions associated with this alternative were calculated based on the difference in earth movement volumes and off-road construction equipment usage relative to the Adjacent Levee Alternative (Proposed Action). As for the Adjacent Levee Alternative (Proposed Action), modeling for this alternative was based on the scenario described above under "Methodology." The difference in ROG, NO_X, and PM_{10} emissions are modeled as a function of change in the number of construction equipment, haul trips and total amount of borrow material relative to the Adjacent Levee Alternative (Proposed Action).

Table 4.11-2a
Summary of Maximum Daily Emissions within Sutter County During 2012–2016 for the Adjacent Levee Alternative (Proposed Action)

Year	2012						2013						2014						2015						2016					
Pollutant	ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$	
			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM
SR 99 NCC Bridge remediation	6.7	37.5	3.0	124.0	2.8	16.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NCC south levee ditch relocations	6.6	53.9	2.4	338.3	2.2	39.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PGCC culvert remediation	-	-	-	-	-	-	-	-	-	-	-	-	11.9	97.3	17.6	59.7	5.9	6.4	-	-	-	-	-	-	-	-	-	-	-	-
Riego Road Canal relocation	-	-	-	-	-	-	-	-	-	-	-	-	1.7	13.1	0.6	108.5	0.5	13.7	-	-	-	-	-	-	-	-	-	-	-	-
Triangle Properties Borrow Site excavation and reclamation	-	-	-	-	-	-	-	-	-	-	-	-	3.9	32.0	1.6	26.7	1.5	0.8	-	-	-	-	-	-	-	-	-	-	-	-
PGCC (Reaches E and H) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6	27.0	1.4	36.3	1.3	4.2	-	-	-	-	-	-
PGCC (Reaches E and H) waterside improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	8.2	0.5	11.3	0.4	1.2	-	-	-	-	-	-
NEMDC North (Reaches F–G) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**22.4**	129.2	6.4	715.7	33.3	72.6
Total unmitigated emissions (lb/day)	13.3	**91.5**	5.5	461.9	5.1	55.9	-	-	-	-	-	-	17.5	**142.4**	19.8	195.0	7.9	20.9	**4.7**	**35.2**	1.9	47.6	1.7	5.4	22.4	**129.2**	6.4	715.7	33.3	72.6
			467.4		61.0				-		-				**214.7**		43.6				**49.5**		7.1				**722.1**		105.9	
FRAQMD Threshold (lb/day)	25	25	80		-[1]		25	25	80		-[1]		25	25	80		-[1]		25	25	80		-[1]		25	25	80		-[1]	
Significant?	No	**Yes**	**Yes**		-		No	No	No		No		No	**Yes**	**Yes**		-		No	**Yes**	**Yes**		-		No	**Yes**	**Yes**		-	
Total mitigated emissions (lb/day)[2]	12.6	54.9	72.3		11.2		-	-	-		-		16.6	**85.4**	40.1		7.5		4.5	**21.1**	8.2		1.7		21.3	**77.5**	75.1		25.6	
Significant with Mitigation Incorporated?	No	No[3]	No		-		No	No[3]	No		-		No	No[3]	No		-		No	No[3]	No		-		No	No[3]	No		-	

Notes: Table entries in bold exceed thresholds.

C = combustion sources (construction equipment); EM = earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; $\mu g/m^3$ = micrograms per cubic meter; NEMDC = Natomas East Mein Drainage Canal; NCC = Natomas Cross Canal; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PGCC = Pleasant Grove Creek Canal; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

[1] FRAQMD does not have an adopted mass emission-based threshold for $PM_{2.5}$; implementation of the District-recommended Fugitive Dust Control Plan and additional control measures are presumed to assure compliance with the applicable SIP attainment goals.

[2] Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would reduce ROG, NO_X, and PM_{10} emissions by approximately 5%, 40%, 85%–90% for fugitive PM_{10} emissions from earthmoving activities, and 45% for mobile-source PM_{10} emissions, respectively.

[3] Coordination of an emissions reduction agreement with the FRAQMD for calculation and fee payment by the project proponent(s) to FRAQMD prior to project approval would be used to offset emissions in excess of FRAQMD's significance thresholds for daily NO_X emission resulting in a less-than-significant impact.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

Table 4.11-2b
Summary of Maximum Daily Emissions within Sacramento County During 2012–2016
(Combined Portions of Phase 4a and 4b Projects) for the Adjacent Levee Alternative (Proposed Action)

Year	2012						2013						2014						2015						2016					
Pollutant	ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$		ROG	NO_X	PM_{10}		$PM_{2.5}$	
			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM
Phase 4a Project – Overlapping Components																														
Sacramento River east levee Reach A:13–15[1]	69.0	409.3	100.0	3,395.1	8.7	295.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riverside Canal[2]	21.7	101.0	280.2	1,233.9	24.4	98.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase 4b Project – All Components																														
American River north levee Reach F:1–4	14.0	144.0	6.7	450.7	6.2	49.2	23.4	169.3	9.9	28.3	9.1	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Drainage Canal	-	-	-	-	-	-	4.3	37.9	1.6	439.7	1.5	55.9	-	-	-	-	-	-						-	-	-	-	-	-	-
City of Sacramento Pumping Plant modifications	-	-	-	-	-	-	10.2	80.4	4.4	1.8	4.0	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sacramento River east levee Reach A:16–20	-	-	-	-	-	-	44.1	374.9	21.3	964.4	19.6	105.8	44.2	374.9	21.3	964.4	19.6	105.8	-	-	-	-	-	-	-	-	-	-	-	-
South Fisherman's Lake Borrow Area and West Lakeside School Site excavation and reclamation	-	-	-	-	-	-	-	-	-	-	-	-	3.6	29.5	1.5	21.3	1.3	0.8	-	-	-	-	-	-	-	-	-	-	-	-
RD 1000 Pumping Plant modifications	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.2	80.4	4.4	1.8	4.0	0.2	-	-	-			-
NEDMC South (Reaches E and H) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63.4	482.8	25.1	648.0	23.1	74.4	-	-	-	-	-	-
NEMDC South (Reaches E and H) waterside improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	19.7	1.1	27.3	1.0	2.9	-	-	-	-	-	-
NEMDC North (Reaches F–G) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.7	136.6	6.8	756.8	35.2	76.7
Total unmitigated emissions (lb/day)	104.7	**654.3**	386.9	5,079.7	39.3	443.1	81.9	**662.5**	37.1	1,434.1	34.2	164.9	47.7	**404.4**	22.7	985.7	20.9	106.6	76.4	**582.9**	30.5	677.1	28.1	77.5	23.7	**136.6**	6.8	756.8	35.2	76.7
SMAQMD Threshold	-	**85**	-		-		-	**85**	-		-		-	**85**	-		-		-	**85**	-		-		-	85	-		-	
Significant?	-	**Yes**	-[4]		-		-	**Yes**	-[4]		-			**Yes**	-[4]		-		-	-	-[4]		-		-	**Yes**	-[4]		-	
Total mitigated emissions (lb/day)[3]	99.5	392.6	974.8		88.1		77.8	397.5	235.5		43.5		45.3	242.6	160.4		27.5		72.6	349.7	118.4		27.1		22.5	82.0	79.4		27.0	
Significant with Mitigation Incorporated?	-	No[5]	No[4]		-		-	No[5]	No[4]		-		-	No[5]	No[4]		-		-	No[5]	No[4]		-		-	No[5]	No[4]		-	

Notes: Table entries in bold exceed thresholds.

C = combustion sources; EM = earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; $\mu g/m^3$ = micrograms per cubic meter; NEMDC = Natomas East Main Drainage Canal; NCC = Natomas Cross Canal; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PGCC = Pleasant Grove Creek Canal; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

[1] Earthmoving activities during Sacramento River east levee Reaches 13–15 include excavation of borrow sites and movement of levee fill material totaling approximately 1.3 million cubic yards.

[2] Earthmoving activities during Riverside Canal relocation include excavation of borrow site material totaling approximately 410,000 cubic yards.

[3] Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would reduce ROG, NO_X, and PM_{10} emissions by approximately 5%, 40%, 85%–90% for fugitive PM_{10} emissions from earthmoving activities, and 45% for mobile-source PM_{10} emissions, respectively.

[4] SMAQMD does not have an adopted mass emission-based threshold for PM_{10}. However, in absence of a localized threshold, emissions are compared against concentration based Ambient Air Quality Standards (AAQS); PM_{10} 24-hr standard = 50 $\mu g/m^3$; SMAQMD's CEQA Guide allows for enhanced PM_{10} Dust Control Practices to be proposed and implemented at the proposed project site for quantifiable emissions reductions. The proposed Phase 4b Project has developed a comprehensive Fugitive Dust Control Plan in compliance with the guidelines that will effectively reduce mass PM_{10} emissions below the concentration based thresholds.

[5] Payment into SMAQMD's Off-site Construction Mitigation Fee Program to offset NO_X emissions in excess of SMAQMD's significance threshold would reduce impacts for this pollutant in SMAQMD's jurisdiction to a less-than-significant level.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction, etc.).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2009

Total unmitigated worst-case emissions under the Fix-in-Place Alternative would be similar to those under the Adjacent Levee Alternative (Proposed Action). **Table 4.11-3** presents maximum daily emissions for the Fix-in-Place Alternative during the peak (worst-case) construction year (2013). Emissions associated with the Fix-in-Place Alternative would not be anticipated to expose nearby existing sensitive receptors to substantial pollutant concentrations and/or substantially contribute to an air quality violation. The Fix-in-Place Alternative would have a direct, adverse impact on air quality. This impact is considered **significant**. ***(Similar)***

Table 4.11-3
Maximum Daily Emissions during the Peak (2013) Construction Season within Sacramento County for the Fix-in-Place Alternative[1]

Year	2013					
Pollutant	ROG	NO_X	PM_{10}		$PM_{2.5}$	
			Combustion	Earthmoving	Combustion	Earthmoving
Total unmitigated emissions (lb/day)	81.9	662.5	37.1	1,062.5	34.2	125.3
SMAQMD Threshold[2]	–	**85**	-[3]		-[3]	
Significant?	–	**Yes**	-		-	
Total mitigated emissions (lb/day)[2]	77.8	398.0	20.4	159.3	18.8	18.8
			180.0		37.6	
Significant with Mitigation Incorporated?	–	No[4]	-		-	

Notes: Table entries in bold exceed thresholds. EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; $\mu g/m^3$ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NO_X = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

[1] Peak daily emissions during the Fix-in-Place Alternative occur entirely within Sacramento County; no activities would occur in Sutter County during the 2013 construction season.

[2] Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NO_X, and PM_{10} emissions by approximately 5% for ROG, 40% for NO_X, 85%–90% for fugitive PM_{10} emissions, and 45% for mobile-source PM_{10} emissions.

[3] SMAQMD does not have an adopted mass emission-based threshold for PM_{10} or $PM_{2.5}$; the project proponent(s) have proposed Fugitive Dust Control Plan(s) and Enhanced Control Measures that will effectively reduce and maintain PM10 and PM2.5 emissions below the applied concentration based thresholds.

[4] Payment into SMAQMD's Off-site Construction Mitigation Fee Program to offset NO_X emissions in excess of SMAQMD's significance threshold would reduce impacts for this pollutant in SMAQMD's jurisdiction to a less-than-significant level.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

Mitigation Measure 4.11-a: Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} During Construction

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement mitigation measures as recommended by FRAQMD or SMAQMD, as applicable, and shall comply with all applicable rules and regulations of FRAQMD or SMAQMD, as described below.

Construction in Sutter County (FRAQMD)

For portions of the project occurring in Sutter County, FRAQMD's Draft *Indirect Source Review Guidelines* and online CEQA guidance provide mitigation measures for reducing temporary and short-term air quality impacts. As recommended by FRAQMD, the project proponent(s) shall ensure that the following mitigation measures are implemented during all

project construction activities to the extent practicable. In addition, construction of the proposed levee improvements are required to comply with all applicable FRAQMD rules and regulations, in particular Rule 3.0 (Visible Emissions), Rule 3.16 (Fugitive Dust Emissions), and Rule 3.15 (Architectural Coatings).

1. The project proponent(s) shall implement a Fugitive Dust Control Plan that includes the following measures:

   - All earthmoving operations shall be suspended when winds exceed 20 miles per hour or when winds carry dust beyond the property line despite implementation of all feasible dust control measures.
   - Construction sites shall be watered as directed by the Sutter County Department of Public Works or FRAQMD and as necessary to prevent fugitive dust violations.
   - An operational water truck shall be on-site at all times. Apply water to control dust as needed to prevent visible emissions violations and off-site dust impacts.
   - On-site dirt piles or other stockpiled particulate matter shall be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce wind blown dust emissions. Incorporate the use of approved nontoxic soil stabilizers to all inactive construction areas according to manufacturers' specifications.
   - All transfer processes involving a free fall of soil or other particulate matter shall be operated in such a manner as to minimize the free-fall distance and fugitive dust emissions.
   - Apply approved chemical soil stabilizers to all inactive construction areas (previously graded areas that remain inactive for 96 hours), including unpaved roads and employee/equipment parking areas, according to the manufacturers' specifications.
   - To prevent track-out, wheel washers shall be installed where project vehicles and/or equipment exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed before each trip. Alternatively, a gravel bed or rumble strip may be installed as appropriate at vehicle/equipment site exit points to effectively remove soil buildup on tires and tracks to prevent/diminish track-out.
   - Paved streets shall be swept frequently (at least once per day by water sweeper with reclaimed water recommended; wet broom) if soil material has been carried onto adjacent paved, public thoroughfares from the project site.
   - Provide temporary traffic control as needed during all phases of construction to improve traffic flow, as deemed appropriate by the Sutter County Department of Public Works and/or Caltrans and to reduce vehicle dust emissions. An effective measure is to enforce vehicle traffic speeds at or below 15 miles per hour on unpaved roads.
   - Reduce traffic speeds on all unpaved surfaces to 15 miles per hour, where feasible, and reduce unnecessary vehicle traffic by restricting access. Provide appropriate training, on-site enforcement, and signage. Where restricting vehicle speeds on unpaved surfaces to 15 miles per hour would make timely completion of the project infeasible, the project proponent(s) shall cooperate with FRAQMD to implement alternative dust control measures that would be at least as effective in reducing fugitive dust emissions. Such measures may include increased frequency in applying water to the

unpaved roads in the vicinity of sensitive receptors and reducing speeds in the vicinity of sensitive receptors.

- Reestablish ground cover on the construction site as soon as possible, through seeding and watering.
- Open burning is yet another source of fugitive gas and particulate emissions, and it shall be prohibited at the project site. No open burning of vegetative waste (natural plant growth wastes) or other legal or illegal burn materials (trash, demolition debris, etc.) may be conducted at the project site. Vegetative wastes should be chipped or delivered to waste to energy facilities (permitted biomass facilities), mulched, composted, or used for firewood. It is unlawful to haul waste materials off-site for disposal by open burning.

2. Construction equipment exhaust emissions shall not exceed FRAQMD Regulation III, Rule 3.0, Visible Emissions Limitations (40% opacity or Ringelmann 2.0). Operators of vehicles and equipment found to exceed opacity limits shall take action to repair the equipment within 72 hours or remove the equipment from service. Failure to comply may result in a notice of violation.
3. The project proponent(s) shall be responsible for ensuring that all construction equipment is properly tuned and maintained before and during on-site operation.
4. Minimize idling time to 10 minutes, to conserve fuel and minimize emissions.
5. Use existing power sources (e.g., power poles) or clean fuel generators rather than temporary diesel-powered generators.
6. Portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, may require ARB Portable Equipment Registration with the state or a local district permit. The owner/operator shall be responsible for arranging appropriate consultations with ARB or FRAQMD to determine registration and permitting requirements before equipment is operated at the site.
7. The project proponent(s) shall assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, and emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower [hp] and greater) that will be used an aggregate of 40 or more hours for the construction project and apply the following mitigation measure:

   - Reduce NO_X emissions from off-road diesel-powered equipment: The project proponent(s) shall provide a plan for approval by FRAQMD demonstrating that the heavy-duty (equal to or greater than 50 hp) off-road equipment to be used in the construction project, including owned, leased and subcontractor vehicles, shall achieve a project wide fleet-average 40% NO_X reduction and 45% particulate reduction[1] compared to the most recent ARB fleet average at time of construction.

     Implementing the FRAQMD-recommended measures is expected to achieve at least a 75% reduction in fugitive dust emissions, 5% reduction in ROG emissions from

[1] Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology (Carl Moyer Guidelines), and after-treatment products; voluntary off-site mitigation projects; providing funds for air district off-site mitigation projects; and/or other options as they become available. FRAQMD should be contacted to discuss alternative measures.

construction equipment, 40% reduction in NO_X emissions from construction equipment, and 45% reduction in PM_{10} emissions from construction equipment (SMAQMD 2004). The resulting maximum average daily construction-generated emissions in Sutter County, with mitigation incorporated, are conservatively calculated to be as high as 21 lb/day of ROG, 78 lb/day of NO_X, 75 lbs/day of PM_{10}, and 26 lb/day of $PM_{2.5}$ for the Phase 4b Project (differences between the Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative occur in Sacramento County).

The project proponent(s) shall implement the following measure to further mitigate NO_X emissions through off-site reductions:

8. The project proponent(s) shall enter into a voluntary emissions reduction agreement with the FRAQMD to mitigate the portion of construction-generated emissions of NO_X that exceeds the FRAQMD CEQA thresholds established in the 2010 Draft *Indirect Source Review Guidelines*, as presented in Section 4.11.1.2. Prior to the occurrence of any construction-related activities within areas under the jurisdiction of the FRAQMD, the project proponent(s) will provide to the FRAQMD detailed equipment inventories which will be used to calculate the NO_X emissions offset fee. Predicted emissions estimates presented in the EIS/EIR represent worst-case emissions and would not be used to calculate the offset fee. The applicable fee rate shall be determined and the total fee shall be calculated based on the fee rate in effect at the time that subsequent environmental documents are prepared. The fee for subsequent construction projects shall be remitted to the FRAQMD.

Implementation of the mitigation measures described above would reduce project-generated construction-related emissions of ROG, NO_X, and PM_{10} below the FRAQMD-recommended thresholds of 25 lb/day for ROG and NO_X, and 80 lb/day for PM_{10}. This impact is considered **less than significant**. ***(Similar)***

Construction in Sacramento County (SMAQMD)

For portions of the project occurring in Sacramento County, SMAQMD's *Guide to Air Quality Assessment in Sacramento County* (SMAQMD 2004) provides mitigation measures for reducing temporary and short-term air quality impacts. As recommended by SMAQMD, the project proponent(s) shall ensure that the following mitigation measures are implemented during all project construction activities to the extent practicable and feasible.

- The project proponent(s) shall prepare a construction emissions dust control plan(s) in accordance with SMAQMD recommendations that reduces fugitive dust emissions by at least 85% (or shall provide calculations based on SMAQMD-approved methodologies showing that emissions would be reduced to less than 100 tons per year assuming a conservative reduction of 75% with typical mitigation). All grading operations shall be suspended when fugitive dust levels exceed levels specified by SMAQMD rules. The project proponent(s) and primary construction contractors shall ensure that dust is not causing a nuisance beyond the property line of the construction site.

- If overlapping construction phases in Sacramento County create unmitigated PM_{10} emissions in excess of the General Conformity threshold, per SMAQMD Rule 104, of100 TPY, the project proponent(s) shall use advanced dust suppressant materials (such as EnviroTac II) on all unpaved roadways and stockpiled materials to ensure enhanced fugitive dust control up to 90% or greater of fugitive dust and PM_{10} emissions.

- The project proponent(s) shall develop a plan, in consultation with SMAQMD, demonstrating that the heavy-duty (>50 hp), off-road vehicles to be used in the construction project (including owned, leased, and subcontractor vehicles) shall achieve a project-wide fleet-average 40% NO_X reduction and 45% particulate reduction compared to the most recent ARB fleet average at the time of construction.[2]

- A comprehensive inventory of all off-road construction equipment equal to or greater than 50 hp that will be used for an aggregate of 40 or more hours during any portion of project construction shall be submitted to SMAQMD. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction operations occur. At least 48 hours before heavy-duty off-road equipment is used, the project proponent(s) shall provide SMAQMD with the anticipated construction timeline, including the start date, and the name and phone number of the contractor's project manager and on-site foreman.

- Emissions from off-road, diesel-powered equipment used on the project site shall not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) shall be repaired immediately, and SMAQMD shall be notified of noncompliant equipment within 48 hours of identification. A visual survey of all in-operation equipment shall be made at least weekly. A monthly summary of visual survey results shall be submitted to SMAQMD throughout the construction period, except that the monthly summary shall not be required for any 30-day period in which no construction operations occur. The monthly summary shall include the quantity and type of vehicles surveyed, as well as the dates of each survey. SMAQMD and/or other officials may conduct periodic site inspections to determine compliance.

- The project proponent(s) shall pay SMAQMD an off-site mitigation fee for implementation of any proposed alternatives for the purpose of reducing NO_X emissions impacts to a less-than-significant level. Based on the construction information presented in Chapter 2, "Alternatives" and the emissions calculations shown in **Appendix F**, if the Proposed Action is implemented, the total estimated fee, including a 5% administrative fee, for elements occurring during the 2012 through 2016 construction seasons within Sacramento County would be $222,936. The fee calculation to offset daily NO_X emissions is based on the cost to reduce 1 ton of NO_X at the time when the document is prepared (currently $16,400 per ton). An initial payment, based on 50% of the estimated fee, shall be remitted to SMAQMD before groundbreaking. The final mitigation fee shall be based on contractor equipment inventories provided by the project proponent(s) to SMAQMD and would reconcile any fee discrepancies due to schedule adjustments or increased equipment inventories.

Implementing the SMAQMD-recommended measures is expected to achieve at least a 85–90% reduction in fugitive dust emissions, 5% reduction in ROG emissions from construction equipment, 40% reduction in NO_X emissions from construction equipment, and 45% reduction in PM_{10} emissions from construction equipment (SMAQMD 2004). The resulting maximum average daily construction-generated emissions with mitigation incorporated are shown in **Table 4.11-2**.

Implementation of the measures described above would reduce project-generated construction-related emissions in Sacramento County to a **less-than-significant** level for PM_{10}, NO_X, and ROG. ***(Similar)***

[2] Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, particulate-matter traps, engine retrofit technology, after-treatment products, and/or such other options as become available.

All Project Construction

The project proponent(s) shall implement the following additional measures to reduce construction emissions of PM_{10} comprising fugitive dust and mobile-exhaust and ozone precursors throughout the project area:

- Open burning of removed vegetation shall be prohibited. Vegetation material shall be chipped on-site or delivered to waste-to-energy facilities to the extent feasible.
- An operational water truck shall be on-site at all times. Water shall be applied to control dust as needed to prevent dust impacts off-site. Unpaved areas subject to vehicle traffic, including employee parking areas and equipment staging areas, shall be stabilized by being kept wet, treated with a chemical dust suppressant or soil binders, or covered.
- The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventive measures, and removed within 1 hour from adjacent streets such material anytime track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations. All visible roadway dust tracked out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a HEPA filter equipped vacuum device shall be used for roadway dust removal.
- Low-sulfur fuel shall be used for stationary construction equipment.
- Existing power sources or clean fuel generators shall be used rather than temporary power generators to the extent feasible.
- Low-emission on-site stationary equipment shall be used.
- Vehicle speeds on unpaved roadways shall be limited to 15 miles per hour.
- Idling time for all heavy-duty equipment shall be limited to 5 minutes.
- When feasible and determined to be necessary, install ARB-certified Level 3 diesel particulate filters (DPF) on diesel-powered construction equipment pieces. All DPFs shall be kept in working order and maintained in operable condition according to manufacturer's specifications. At the time of writing, a list of ARB-certified Level 3 DPF can be found at http://www.arb.ca.gov/ diesel/verdev/level3/level3.htm.

Responsibility:	Project proponent(s)
Timing:	Prior to construction for preparation of dust control plans, during construction for implementation of dust control measures and maintenance of equipment to required specifications.
Enforcement:	FRAQMD for construction in Sutter County, SMAQMD for construction in Sacramento County.

Implementation of the mitigation measures listed above would reduce temporary and short-term ROG, NO_X, and PM_{10} emissions resulting from the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. Offset mitigation fees would reduce NO_X emissions to a less-than-significant level. Therefore, this impact would be **less than significant.** ***(Similar)***

Impact 4.11-b: General Conformity with the Applicable Air Quality Plan

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no construction emissions associated with such construction would result. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding, necessitating emergency procedures. Extensive construction required to repair infrastructure damages would result in ozone precursor emissions and PM_{10}. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered to **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

The General Conformity Rule, which addresses whether a project conforms to the State Implementation Plan (SIP) approved and promulgated under Section 110 of the Federal Clean Air Act (CAA), applies to Federal actions that would generate emissions of criteria air pollutant or precursor emissions in nonattainment or maintenance areas. The Phase 4b Project is located within the Sacramento Metropolitan Nonattainment Area, which includes Southern Sutter County and all of Sacramento County, and is currently designated as severe-15 nonattainment for the 8-hour NAAQS ozone standard. In addition, the Sacramento County portion of the Sacramento Valley Air Basin is designated as moderate nonattainment for the national PM_{10} standard, while Sutter County is unclassified for PM_{10}. General conformity requirements would apply to actions where the total project-generated direct or indirect emissions would be equal to or exceed the applicable emissions levels, known as the *de minimis* thresholds. If the *de minimus* thresholds are exceeded, a conformity determination would be required prior to project approval. The *de minimis* thresholds applicable to the Sacramento Metropolitan Nonattainment area are provided in Section 4.11.1.2, "Thresholds of Significance," above.

As discussed above, ozone precursor emissions of ROG and NO_X would occur associated primarily with construction equipment exhaust and asphalt paving. Fugitive PM_{10} emissions are associated primarily with site preparation and earthmoving activities. Because general conformity is determined by calendar year, total emissions were calculated for 2012–2016 calendar years using worst-case assumptions, as presented in **Tables 4.11-2a** and **4.11-2b**.

Annual construction-generated emissions that would occur during calendar years 2012–2016 under worst-case assumptions for air quality analysis are shown in **Table 4.11-4**. Conformity determinations are based on the applicable Air Quality Management Plan (AQMP) in place within the Sacramento Metropolitan Nonattainment area. Total annual emissions (in both Sutter and Sacramento Counties), with mitigation proposed under Mitigation Measure 4.11-a implemented, are presented in **Table 4.11-4**. With mitigation, worst-case maximum annual emissions are below the *de minimus* thresholds and therefore would not conflict with the achievement of regional attainment goals, as established in the applicable SIP (See **Appendix F** for detailed emission sources and assumptions).

Finally, project operation (discussed under Impact 4.11-c, below) would result in minimal emissions of pollutants for which the region is in nonattainment. Construction of the Adjacent Levee Alternative (Proposed Action) is not

anticipated to conflict with implementation of the SIP, and a conformity determination would not be required prior to project approval. For this reason, this impact is considered **less than significant**.

Fix-in-Place Alternative

According to current Federal standards, EPA's General Conformity Rule requirements apply only for the Adjacent Levee Alternative (Proposed Action). However, for purposes of this analysis, the emissions of criteria air pollutant or precursor emissions under the Fix-in-Place Alternative were calculated and are shown in **Table 4.11-5**. Conformity applicability is determined based on the established *de minimus* thresholds, developed to support regional attainment goals established in current AQMPs and SIPs. Total worst-case emissions for the Fix-in-Place Alternative, with mitigation proposed under Mitigation Measure 4.11-a, are presented in **Table 4.11-5**. As described above, emissions from the Fix-in-Place would be similar to the Adjacent Levee Alternative (Proposed Action), resulting in lesser emissions due to less total material required for proposed activities. Because the emissions under this alternative would fall below the Federal *de minimis* threshold, implementation of the Fix-in-Place Alternative would not conflict with implementation of the SIP, and therefore if selected in place of the Adjacent Levee Alternative (Proposed Action), a conformity determination would not be required. Therefore, this impact is considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.11-c: Long-Term Changes in Emissions of ROG, NO_X, and PM_{10} Associated with Project Implementation

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no long-term changes in emissions related to the project would occur. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Efforts to reconstruct the levee would depend on the extent and location of damage. Equipment such as pumping plants would likely be used, generating temporary and short-term emissions of air quality pollutants. Upon completion of levee repairs, generation of these emissions would not be substantially greater than in a no-action, no-flood scenario. However, a precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Table 4.11-4
Summary of Maximum Annual Emissions During the 2012–2016 Construction Seasons
(Combined Portions of Phase 4a and 4b Projects) for the Adjacent Levee Alternative (Proposed Action)

Project Phase Components	Annual Emissions																											
	2012 (TPY)						2013 (TPY)						2014 (TPY)						2015 (TPY)						2016 (TPY)			
	ROG	NOX	PM10		PM2.5		ROG	NOX	PM10		PM2.5		ROG	NOX	PM10		PM2.5		ROG	NOX	PM10		PM2.5		ROG	NOX	PM10		PM2.5	
			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM
Phase 4a Project – Overlapping Portions	5.5	31.2	1.3	414.9	1.2	44.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase 4b Project – All Components	1.2	8.5	0.4	40.3	0.4	4.5	4.1	29.8	1.6	91.4	1.5	10.1	3.5	25.9	1.5	74.6	1.3	7.9	5.0	33.6	1.8	40.9	1.3	3.3	3.9	22.3	1.1	114.1	3.7	12.5
Annual Unmitigated Emissions Total	6.7	39.6	1.8	455.2	1.6	49.0	4.1	29.8	1.6	91.4	1.5	10.1	3.5	25.9	1.5	74.6	1.3	7.9	5.0	33.6	1.8	40.9	1.3	3.3	3.9	22.3	1.1	114.1	3.7	12.5
Annual Mitigated Emissions Total[1]	6.4	24.0	69.2		8.2		3.9	18.0	14.6		2.3		3.3	15.5	12.0		1.9		4.7	20.1	7.1		1.2		3.7	13.4	17.7		3.9	
General Conformity Threshold	25	25	100		100		25	25	100		100		25	25	100		100		25	25	100		100		25	25	100		100	
Exceed *de minimus* Threshold?	No	No	No		No		No	No	No		No		No	No	No		No		No	No	No		No		No	No	No		No	

Notes: Table entries in bold exceed thresholds. C = Emissions from combustion (from construction equipment); EM = PM emissions from earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; µg/m3 = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NOX = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM10 = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

1 Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NOX, and PM10 emissions by approximately 5% for ROG, 40% for NOX, 85%–90% for fugitive PM10 emissions, and 45% for mobile-source PM10 emissions.

See Appendix F for assumptions and modeling results for each project activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

Table 4.11-5
Maximum Annual Emissions during the Peak (2013) Construction Season for the Fix-in-Place Alternative[1]

Pollutant	ROG	NO_X	PM_{10}		$PM_{2.5}$	
			Combustion	Earthmoving	Combustion	Earthmoving
Total unmitigated emissions (tons/year)	4.2	31.8	1.7	65.4	1.5	7.3
SMAQMD Threshold[2]	**25**	**25**	**100**		**100**	
Significant?	–	**Yes**	No		No	
Total mitigated emissions (tons/year)[2]	4.0	19.1	0.9	9.8	0.8	1.1
			10.7		1.9	
Significant with Mitigation Incorporated?	No	No	No		No	

Notes: Table entries in bold exceed thresholds.
EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; $\mu g/m^3$ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NO_X = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

[1] Peak daily emissions during the Fix-in-Place Alternative occur entirely within Sacramento County; no activities would occur in Sutter County during the 2013 construction season.

[2] Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NO_X, and PM_{10} emissions by approximately 5% for ROG, 40% for NO_X, 85%–90% for fugitive PM_{10} emissions, and 45% for mobile-source PM_{10} emissions.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction.).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Long-term project operation would not result in increased regional emissions of ROG, NO_X, and PM_{10} from mobile-, stationary-, or area-source emissions. Project implementation would require a negligible increase in operational maintenance activities at the proposed facilities, and associated vehicle trips. In addition, the levee system would not require extensive landscape maintenance or other activities that would result in a substantial net increase in emissions in comparison with the No-Action Alternative or existing conditions.

Furthermore, project implementation would not result in the operation of any new major stationary emission sources. Modifications to RD 1000 pumping plants and City of Sacramento sump pumps would require replacement of some motors; however, these motors operate on electricity. Modifications may also include the addition of diesel-powered backup generators, but these additions would be minor stationary sources of emissions. The diesel-powered backup generators would be used in emergency situations and would be tested monthly. Stationary equipment such as diesel-powered generators would be subject to the applicable air district's permitting process and Best Available Control Technology (BACT) and offset requirements. The applicable air district's permitting process would ensure that emissions from equipment are within acceptable limits. Emissions of ozone precursors and PM_{10} associated with pump station operation would be negligible. No other stationary sources of emissions would be associated with the action alternatives. Thus, long-term operational emissions of criteria air pollutants or precursors would not result in or substantially contribute to a violation of the applicable air quality standards. Because project operation would not result in a direct, adverse impact on air quality, this impact is considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.11-d: Exposure of Sensitive Receptors to Toxic Air Emissions

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no potential exists for direct exposure of sensitive receptors to project-related toxic air emissions. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. In the event of a flood, toxic air emissions could be associated with the use of equipment during cleanup operations. However, effects on sensitive receptors would depend on many factors (e.g., magnitude and duration of emissions, proximity to sensitive receptors), and therefore the magnitude of the impact cannot be predicted. For these reasons, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Project construction and operation would generate emissions of diesel PM, which is identified by ARB as a TAC. TAC emission sources are discussed separately below. Neither FRAQMD nor SMAQMD have any current guidance on TAC emissions from mobile equipment, and neither has a threshold of significance for exposure to emissions from this equipment.

Project construction would result in the temporary and short-term generation of diesel exhaust emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities, in addition to diesel-fueled on-road haul trucks used for hauling borrow material. The dose to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). According to the Office of Environmental Health Hazard Assessment and California Air Pollution Control Officer's Association (CAPCOA) Guidelines, health risk assessments (HRAs) that determine the exposure of sensitive receptors to TAC emissions should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (CAPCOA 2009).

The duration of mobilized equipment used near sensitive receptors located along the levee system and borrow sites would be short (less than 24 months for the cumulative Phase 4b Project). Each construction season would last approximately 6 months. In addition, as improvements are completed, mobile equipment would progress along the levees and canal alignments and would not operate near (within approximately 500 feet) any one sensitive receptor for more than a maximum of a few weeks. Sensitive receptors located near (within 500 feet of) the borrow areas would likely experience longer exposure periods than receptors located along the levee alignments but would be located a greater distance from most of the borrow activities (see **Plates 2-6, 2-7a, 2-7b, 2-9, 2-11, 2-13, 2-14, 2-16, and 2-17** for a depiction of Phase 4b Project construction areas). The project would represent less than 0.1% of the 70-year exposure period for any nearby sensitive receptor in the area. Because the exposure period for receptors in the vicinity of the project would be minimal, and because the local air districts do not have guidance for preparation of HRAs for construction equipment, an HRA is not recommended for construction activities associated with the action alternatives.

As discussed under Impact 4.11-c, above, the RD 1000 pumping plants and City of Sacramento sump pumps to be modified as part of the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative would be minor stationary sources of TAC emissions in Sacramento Counties. Diesel-powered backup generators would be used in emergency situations and would be tested monthly. Consequently, diesel PM emissions associated with the modified pump stations would be infrequent. Furthermore, this category of stationary source (i.e., portable equipment), in addition to any other stationary sources that may emit TACs (i.e., dry cleaners), would be subject to FRAQMD and SMAQMD permitting and toxic best available control technology (T-BACT) requirements. If the implementation of T-BACT would not reduce emissions to an acceptable level, then FRAQMD and SMAQMD would deny the required permit for the stationary source (in this case, the diesel-powered backup generators). Therefore, operation of these stationary sources would not expose sensitive receptors to substantial concentrations of TACs. No other stationary sources of emissions would be associated with any of the action alternatives. Thus, this impact is considered to be **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

4.11.3 RESIDUAL SIGNIFICANT IMPACTS

In the event of a levee failure under the No-Action Alternative, impacts due to temporary and short-term construction emissions, lack of general conformity with the Air Quality Plan, long-term emissions, and exposure of sensitive receptors to toxic air emissions are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

4.12 NOISE

4.12.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.12.1.1 METHODOLOGY

Construction-related and stationary-source noise impacts were calculated based on the Federal Transit Noise and Vibration Impact Assessment methodology (Federal Transit Administration [FTA] 2006). Reference emission noise levels and usage factors were based on the Federal Highway Administration (FHWA) Roadway Construction Noise Model. The FHWA Roadway Noise Prediction Model (FHWA-RD-77-108) was used to calculate traffic noise levels along haul routes, based on estimates described in Chapter 2, "Alternatives."

4.12.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to noise if they would do any of the following:

- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- expose people residing or working in the project area to excessive noise levels;
- expose persons to or generate excessive groundborne vibration or groundborne noise levels;
- for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- for a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

The following considerations apply to the first three significance thresholds:

- **Temporary and short-term construction noise impacts:** Temporary and short-term construction noise impacts are considered significant if construction-generated noise levels exceed the applicable standards at nearby noise-sensitive land uses.
- **Noise impacts from haul truck traffic:** For all affected residential land uses, noise that would be generated by haul truck traffic is considered significant if it would cause the overall exterior noise level to exceed the "normally acceptable" exterior land use compatibility noise standard of 60 A-weighted decibels (dBA) L_{dn}/CNEL (day-night average noise level/community noise equivalent level) for residential land uses or would exceed the interior noise standard of 45 dBA L_{dn}/CNEL in any inhabitable residence.
- **Exposure of sensitive receptors to, or generation of, excessive vibration levels:** Short- and long-term vibration impacts would be significant if project construction or operation would result in the exposure of sensitive receptors to, or would generate, vibration levels that exceed Caltrans' recommended standard of 0.2 inch per second (in/sec) peak particle velocity (PPV) with respect to the prevention of structural damage for normal buildings (Caltrans 2002), or FTA's maximum acceptable vibration standard of 80 vibration

decibels (VdB) with respect to human response for residential uses (i.e., annoyance) (FTA 2006) at any nearby existing sensitive land uses.

Portions of the Phase 4b Project activities would be located inside the Airport Land Use Compatibility Plan (ALUCP) area. Construction of proposed improvements to the West Drainage Canal would occur in the Airport's 60 dBA L_{dn} noise contour, and the canal is located over one nautical mile south of the nearest runway. The project would not result in locating new receptors or workers that would reside or work in the area for an extended period of time. Therefore, this impact is not discussed further in the EIS/EIR.

4.12.2 IMPACTS AND MITIGATION MEASURES

Impact 4.12-a: Generation of Temporary and Short-Term Construction Noise

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no potential exists for the Phase 4b Project to generate temporary and short-term construction noise. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Noise-sensitive land uses (in this case, primarily residential uses) are scattered throughout the area in which repair-related construction would occur. However, levee failure would likely result in evacuation of people (i.e., sensitive receptors) from damaged levee locations. Without sensitive receptors, potential impacts related to temporary and short-term construction noise would be **less than significant**. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action)

Construction of the Adjacent Levee Alternative (Proposed Action), as described in Section 2.3.3.2, would generate temporary, short-term, and intermittent noise at or near individual noise-sensitive locations in the Phase 4b Project area. However, construction of some of the proposed Phase 4b Project components, including excavation and grading at the South Fisherman's Lake Borrow Area, the PGCC and NEMDC South bank protection, SR 99 NCC Bridge Remediation, West Drainage Canal realignment and bank improvements, relocation of the Vestal Drain ditch, conversion of the Brookfield borrow site to managed marsh, and improvements to the Chappell Drain and Ditch would not affect sensitive receptors because no noise-sensitive land uses are within 1,000 feet of construction activities and/or because topographic features (such as a levee) would shield sensitive receptors from noise sources. Construction noise impacts associated with these components would be less than significant.

Overview of Construction Activities and Equipment

Construction along levee and canal alignments would generally proceed in a linear manner, with the highest noise levels affecting individual residences and businesses for 2–3 weeks in most locations. Construction of the adjacent levee and associated cutoff walls, seepage berms, and relief wells would take place in Sacramento River east levee Reach A:16–20. A cutoff wall would be installed in the American River north levee east of Gateway Oaks Drive to Northgate Boulevard. Improvements to the west levee of NEMDC North (raising, widening, and installing cutoff walls) would occur from just south of Elkhorn Boulevard to Sankey Road. The PGCC west levee would be raised and widened. Culverts located beneath the PGCC would be upgraded or removed, and detention

basins would be constructed in the Triangle Properties Borrow Area, as needed. Irrigation canals and ditches would be relocated to either make room for expanded levee sections or to reduce underseepage potential. Discharge pipes for RD 1000 pumping plants and City of Sacramento sump pumps would be raised to cross the levee above the designed water surface profile. Parcels in the South Fisherman's Lake and Triangle Properties Borrow Areas and at the West Lakeside School Site would be excavated and reclaimed as agricultural land. Noise levels in the vicinity of noise-sensitive land uses (e.g., residences and businesses) would fluctuate depending on the physical location of construction activities and on the particular type, number, and duration of use of various pieces of construction equipment. On-site equipment required for construction activities would include excavators, backhoes, bulldozers, scrapers, rollers, graders, loaders, compactors, and various trucks. Drilling augers and associated support equipment would also be needed for replacement of wells required by levee expansion. Individual equipment maximum noise levels produced by these operations could range from 79 to 90 dBA without the implementation of feasible noise control at a distance of 50 feet from the nearest noise source, as indicated in **Table 4.12-1**.

Table 4.12-1
Construction Equipment Noise Emission Levels[1]

Equipment Type	Typical Noise Level (dB) at 50 feet	Equipment Type	Typical Noise Level (dB) at 50 feet
Air compressor	78	Groundwater well drilling operations[2]	77
Asphalt paver	77	Generator	81
Backhoe	78	Grader	85
Compactor	83	Hoe ram extension	90
Concrete breaker	82	Jack hammer	89
Concrete pump	81	Pneumatic tools	85
Concrete saw	90	Rock drill	81
Crane, mobile	81	Scraper	84
Dozer	82	Trucks	74–81
Front-end loader	79	Water pump	81

Notes: dB = A-weighted decibels (dBA)
[1] All equipment fitted with properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are the actual measured noise levels for each piece of heavy construction equipment.
[2] Groundwater well drilling noise was measured by EDAW/AECOM (now AECOM) for the Phase 2 EIR 1st Addendum dated May 27, 2009.
Sources: Bolt, Beranek, and Newman 1981; FTA 2006; AECOM 2009

Sensitive Receptors

Noise-sensitive land uses (i.e., residential) are scattered throughout the areas in which construction would occur. Waterside residences are located along the Sacramento River east levee, with the greatest concentration in Reach A:16–18B (see **Plate 2-7a**). Rural residences are located on the landside of the Sacramento River east levee in Reach A:16–18B (**Plate 2-7a**); some of these residences would be removed prior to construction of levee improvements. Rural residences are also located in the vicinity of proposed improvements to the west levees of the PGCC (**Plate 2-13**), NEMDC North (**Plate 2-11**), a 500-foot-long section of the west levee of the NEMDC south of Elkhorn Boulevard (**Plate 2-14**), and the Morrison Irrigation Canal. Residential subdivisions are located adjacent to the Sacramento River east levee Reach A:19A–20 (**Plate 2-7b**), American River north levee Reach I:1–4 (**Plate 2-9**), the West Lakeside School Site (**Plate 2-17**), and the South Fisherman's Lake Borrow Area (**Plate 2-7a**). These sensitive receptors would be exposed to construction noise for several weeks to as long as

several months, depending on the extent to which schedules for the various construction activities listed above are staggered over the construction season.

Predicted Noise Levels from Construction Activity

Construction noise attributable to the Phase 4b Project was estimated using the FTA noise methodology for the prediction of heavy equipment noise sources (FTA 2006). **Table 4.12-2** shows the results for the various stages of construction activities associated with the proposed levee and canal improvements, based on the equipment requirements for construction shown in Chapter 2, "Alternatives," and the distances to the 45-dBA and 50-dBA noise contours assuming no intervening barriers. **Appendix G** shows the complete listing of inputs and the methodology for predicting noise levels from construction.

Table 4.12-2
Predicted Noise Levels Attributable to Major Construction Activities

Action	Project Improvement Type	Resulting Noise Level in dBA L_{eq} at 100 Feet	Distance to Noise Contour (Feet)	
			50 dBA[1]	45 dBA[1]
Clearing and grubbing/stripping	Levee, Canal	77.6	2,386.3	4,243.5
Landside structures removal	Levee	76.6	2,074	3,688
Stability berm excavation	Levee	77.9	2,473	4,397
Adjacent levee construction	Levee	77.9	2,473	4,397
Cutoff wall construction	Levee	77.3	2,314	4,114
Groundwater well drilling operations[2]	Levee	70.8	1,035	1,815
Garden Highway reconstruction	Levee	76.1	2,019	3,591
Levee degrading	Canal	76.7	2,173	3,863
Pipeline removal	Canal	75.6	1,912	3,400
Cutoff wall construction	Canal	76.0	1,990hy	3,538
Levee crown reconstruction	Canal	75.1	1,806	3,211
Borrow site excavation	Canal	75.9	1,965	3494
Site restoration, demobilization	Levee, Canal	75.9	1,970	3,504

Notes: dBA = A-weighted decibel; L_{eq} = energy-equivalent noise level

[1] Distances to noise contours do not take into account intervening topography or existing structure façades.

[2] Groundwater well drilling noise was measured by EDAW/AECOM (now AECOM) for the Phase 2 EIR 1st Addendum dated May 27, 2009.The equation: L_{eq} (equipment) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Source: FTA 2006; Data modeled for USACE and SAFCA by AECOM in 2009

As shown in **Table 4.12-2**, the predicted highest, unmitigated noise level associated with construction activities would be 77.9 dBA L_{eq} at 100 feet from use of heavy equipment associated with the levee and canal improvements and modifications to pumping plants. In some work locations, construction noise would be temporary and short-term, and impacts would generally not result in annoyance. In other instances, the levee itself may serve as a sound barrier that provides some protection to sensitive land uses. For instance, residences on the waterside of the Sacramento River east levee would be shielded from the highest noise levels that would occur with construction activity at the landside toe.

24 Hours Per Day, 7 Days Per Week Construction

Assuming a standard exterior-to-interior attenuation rate of 25 dBA for typical residential buildings with doors and windows closed, noise generated by construction equipment could result in interior noise levels that exceed the interior noise standard of 45 dBA L_{dn}/CNEL for residential land uses established by the City of Sacramento, Sacramento County, and Sutter County. Although construction activity is expected to take place during daytime hours (between 6:00 a.m. and 10:00 p.m.), because of the need to complete levee improvements outside of the flood season and because of other environmental and engineering constraints on project schedule, as described in Chapter 2, "Alternatives," it is possible that construction may need to be conducted 24 hours per day, 7 days per week (24/7) in rural areas; this construction schedule would not be implemented in urban areas. For example, installation of cutoff walls along the Sacramento River east levee Reach A:16–19A as far east as the I-80 overcrossing and along the west levee of NEMDC North would be conducted 24/7 during a 2- to 3-month portion of the 156-day construction season. In addition, replacement of groundwater wells in Sacramento River east levee Reach A:18B and along the west levee of NEMDC North would require 24-hour construction for up to 3 days. Therefore, noise may be generated by construction equipment operating near homes during the more noise-sensitive early morning and nighttime hours (i.e., during hours that are not exempted by the applicable local ordinances in the City and County of Sacramento) and could result in sleep disturbance at nearby residences. Cutoff wall construction from I-80 to Northgate Boulevard (Sacramento River east levee Reach A:19A–20 and American River north levee Reach I:1–4) would only be conducted during daytime hours (between 6:00 a.m. and 10:00 p.m.).

The standard for exterior night time noise levels established by Sacramento County and the City of Sacramento is 60 dBA L_{dn}. Noise models indicate that noise levels from cutoff wall construction equipment (deep soil mixing equipment or long-stick excavators) would be at or below 60 dBA L_{dn} at a distance of 500 feet from the construction equipment. Based on this distance of 500 feet from construction equipment, in the worst case, residents in the vicinity of cutoff wall construction (Sacramento River east levee west of I-80 [Reach A:16–18B] and along the west levee of NEMDC North) could be affected by 24/7 construction for approximately 1 week as the cutoff wall is installed along the levee during the 2- to 3-month portion of the 156-day construction season.

The 500-foot-long distance is modeled based on the assumption that sensitive receptors are located in the line-of-sight from the noise source. Additional reductions in noise levels would come from natural sound barriers, such as existing levees or other structures, including dwellings. For example, cutoff walls along the Sacramento River east levee would be constructed on the landside of the levee (near the toe of the existing levee) at an elevation below the crown of the levee. Therefore, the existing levee would provide some shielding to residents on the waterside of the levee, reducing exterior noise levels at 500 feet by an additional 10–12 dB below the predicted level of 60 dBA L_{dn}. This estimate is based on the assumption that cutoff wall construction equipment would generate noise at the level of 10 feet above ground surface, and the height of the existing levee is 25 feet above ground surface. Waterside residences would be out of the line-of-sight of this equipment.

Impact Summary

Because of their proximity to residences, construction activities associated with the proposed levee and canal improvements as well as borrow site excavation could result in temporary and short-term noise levels that exceed the applicable daytime and nighttime standards for non-transportation sources (**Table 4.12-2**), resulting in increased annoyance and/or sleep disruption to occupants of residential dwellings and other sensitive receptors. These temporary and short-term impacts would be **significant**.

Fix-in-Place Alternative

Noise generation under the Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action). However, in Sacramento River east levee Reach A:16–20, cutoff walls would be installed through the top of the existing levee (Garden Highway), rather than at the landside toe. Therefore, waterside

residences would be exposed to the highest noise levels shown in **Table 4.12-2** without the benefit of the shielding that would be provided by the levee itself. Residents on the landside of the levee would still be subject to noise from scrapers and graders used to flatten the levee slopes. As a result, this alternative would likely cause greater noise disturbance to residents along the construction areas than under the Adjacent Levee Alternative (Proposed Action). These temporary and short-term impacts would be **significant**. ***(Greater)***

Mitigation Measure 4.12-a: Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall ensure that the following measures are implemented at each work site during project construction to avoid and minimize construction noise effects on sensitive receptors:

All Project Construction

- Equipment shall be used as far away as practical from noise-sensitive uses.
- All construction equipment shall be equipped with noise-reduction devices such as mufflers to minimize construction noise, and all internal combustion engines shall be equipped with exhaust and intake silencers in accordance with manufacturers' specifications.
- Equipment that is quieter than standard equipment shall be used, including electrically powered equipment instead of internal combustion equipment where use of such equipment is a readily available substitute that accomplishes project tasks in the same manner as internal combustion equipment.
- Construction site and haul road speed limits shall be established and enforced.
- The use of bells, whistles, alarms, and horns shall be restricted to safety warning purposes only.
- Noise-reducing enclosures shall be used around stationary noise-generating equipment (e.g., compressors and generators).
- Fixed construction equipment (e.g., compressors and generators), construction staging and stockpiling areas, and construction vehicle routes shall be located at the most distant point feasible from noise-sensitive receptors.
- When noise sensitive uses are within close proximity and subject to prolonged construction noise, noise-attenuating buffers such as structures, truck trailers, or soil piles shall be located between noise generation sources and sensitive receptors.
- Before construction activity begins within 500 feet of one or more residences or businesses, SAFCA shall provide written notification to the potentially affected residents or business owners, identifying the type, duration, and frequency of construction activities. Notification materials shall also identify a mechanism for residents or business owners to register complaints with the appropriate jurisdiction if construction noise levels are overly intrusive. The distance of 500 feet is based on the 60-dBA contour of the loudest anticipated construction activity.
- If noise-generating activities are conducted within 100 feet of noise-sensitive receptors (the 70-dBA noise contour of construction noise), the primary contractor shall continuously measure and record noise levels generated as a result of the proposed work

activities. Sound monitoring equipment shall be calibrated before taking measurements and shall have a resolution within 2 dBA. Monitoring shall take place at each activity operation adjacent to sensitive receptors. The recorded noise monitoring results shall be furnished weekly to the project proponent(s).

- The primary contractor shall prepare and implement a detailed noise control plan based on the proposed construction methods and using the recorded noise monitoring results described above to facilitate implementing specific noise-reduction measures. This plan shall identify specific measures to ensure compliance with the noise control measures specified above. The noise control plan shall be submitted to and approved by the project proponent(s) before any noise-generating construction activity begins.

24/7 Project Construction

In addition to the noise-reducing measures listed above, the project proponent(s) shall implement the following measures concerning 24/7 project construction in rural areas (24/7 construction would not occur in urban areas):

- When construction of cutoff walls takes place during nighttime hours (between 10:00 p.m. and 6:00 a.m.), the project proponent(s) shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that cutoff wall construction takes place within 500 feet of the residents requesting reimbursement.

- When construction of groundwater wells (including up to 2 weeks of continuous pump testing for each well) or modifications to pumping plants takes place during nighttime hours (between 10:00 p.m. and 6:00 a.m.), and the resulting noise levels exceed the applicable County noise standard (i.e., 45 dBA L_{eq} and 65 dBA L_{max} for Sutter County and 45 dBA L_{50} and 65 dBA L_{max} for Sacramento County), the project proponent(s) shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that construction of groundwater wells or modifications to pumping plants takes place within 500 feet of the residents requesting reimbursement.

Responsibility:	Project proponent(s)
Timing:	Avoid noise-sensitive land uses, select or modify equipment to reduce noise generation, use enclosures, and notify affected residences and businesses before the start of construction activities; observe speed limits and monitor noise during construction; and reimburse residences who relocate when nighttime construction is within 500 feet for relocation expenses

Implementing this mitigation measure would reduce the impact, but may not reduce noise levels at all times to a less-than-significant level because of the close proximity of noise-sensitive receptors to construction activities and the limited feasibility of mitigating construction noise to acceptable levels. Therefore, these temporary and short-term impacts would remain **significant and unavoidable** for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. ***(Similar)***

Impact 4.12-b: Temporary and Short-Term Exposure of Sensitive Receptors to, or Temporary and Short-Term Generation of, Excessive Groundborne Vibration

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities would occur; therefore, no potential exists for the Phase 4b Project to directly expose sensitive receptors to or generation of excessive groundborne vibration. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Sensitive land uses (in this case, primarily residential uses) are scattered throughout the areas in which repair-related construction would occur. However, levee failure would likely result in evacuation of people (i.e., sensitive receptors) from damaged levee locations. Without sensitive receptors, potential impacts related to the generation of excessive groundborne vibration would be **less than significant**. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction activities for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative have the potential to result in varying degrees of temporary ground vibration, depending upon the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. **Table 4.12-3** displays vibration levels for typical construction equipment.

Table 4.12-3
Typical Construction Equipment Vibration Levels

Equipment	PPV at 25 feet (in/sec)[1]	Approximate Lv at 25 feet[2]
Large bulldozer	0.089	87
Trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Where PPV is the peak particle velocity.
[2] Where Lv is the velocity level in decibels and based on the root mean square velocity amplitude.
Source: FTA 2006

On-site construction equipment would include excavators, backhoes, bulldozers, scrapers, rollers, graders, loaders, compactors, and various trucks. The most intense generation of ground vibration would be associated with large bulldozers that generate levels of 0.089 in/sec PPV and 87 vibration decibels (VdB) at a distance of 25 feet. These levels would attenuate to 0.037 in/sec PPV or 79 VdB at a distance of 45 feet. Residences and commercial buildings in Sacramento River east levee Reach A:19A–20 and along the American River north levee Reach I:1–4 are located within 45 feet of the maximum construction limit areas. Vibration generated by off-road construction equipment could exceed the FTA (80 VdB) standard for the potential of human annoyance at these receptors. It is not expected that sleep disturbance would occur because there would be no nighttime construction activities in these reaches. Ground vibration would also be generated by haul trucks operating on area haul routes. As shown

in **Table 4.12-3**, vibration levels generated by trucks could reach as high as 0.076 in/sec PPV or 86 VdB at a distance of 25 feet. At a distance of 50 feet, haul truck levels would attenuate to 0.027 in/sec PPV and 77 VdB. No residential buildings are located within 50 feet of Phase 4b Project haul routes, which are shown on **Plate 2-6**. Because levels of on-site construction equipment could exceed Caltrans' and FTA's standards from off-road construction equipment, these temporary and short-term impacts related to vibration from other construction equipment would be **significant**. ***(Greater)***

Mitigation Measure 4.12-b: Implement Vibration-Reducing Construction Practices, Prepare and Implement a Groundborne Vibration Control Plan, and Monitor and Record Construction Groundborne Vibration Near Sensitive Receptors

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s)shall ensure that the following measures are implemented at each work site during project construction to avoid and minimize construction groundborne vibration effects on sensitive receptors:

- Equipment shall be used as far away as practical from vibration-sensitive uses.
- Designate a Preservation Director and post contact information in a conspicuous location near the project site, so that it is clearly visible to nearby receptors most likely to be disturbed. The coordinator shall manage complaints and concerns resulting from vibration-inducing activities. The severity of the vibration concern would be assessed by the director, and if necessary, evaluated by a qualified vibration control engineer.
- Before construction activity begins within 45 feet of one or more residences or businesses, written notification shall be provided to the potentially affected residents or business owners, identifying the type, duration, and frequency of construction activities. Notification materials shall also identify a mechanism for residents or business owners to register complaints with the appropriate jurisdiction if construction vibration levels are overly intrusive.
- Before construction activity begins within 45 feet of one or more residences or businesses, the pre-existing condition of all buildings within a 45-foot radius within the immediate vicinity of proposed construction activities shall be recorded in the form of a preconstruction survey. The preconstruction survey shall determine conditions that exist before construction begins for use in evaluating damage caused by construction activities. Fixtures and finishes within a 45-foot radius of construction activities susceptible to damage shall be documented (photographically and in writing) prior to construction. All damage shall be repaired back to its pre-existing condition following the completion of construction activities and post-construction surveys of affected residences or businesses.
- When it is determined that construction generated vibration exceeds the threshold of human annoyance at a sensitive receptor, the project proponent(s) shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that construction takes place within 45 feet of the residents requesting reimbursement.
- The primary contractor shall prepare and implement a detailed vibration control plan based on the proposed construction methods. This plan shall identify specific measures to ensure compliance with the vibration control measures specified above. The vibration control plan shall be submitted to and approved by the project proponent(s) before any vibration-generating construction activity begins.

Responsibility:	Project proponent(s)
Timing:	Avoid vibration-sensitive land uses, designate a Preservation Director, conduct preconstruction surveys of affected buildings, prepare vibration control plan, and notify affected residences and businesses before the start of construction activities; implement vibration control plan and make Preservation Director available for complaint management during construction; reimburse residences who relocate when vibration-producing construction activities are within 45 feet for expenses after construction

Implementing this mitigation measure would reduce the impact, but may not reduce vibration levels at all times to a **less-than-significant** level because of the close proximity of vibration-sensitive receptors to construction activities and the limited feasibility of mitigating construction noise to acceptable levels, especially during nighttime hours. Therefore, these temporary and short-term impacts would remain **significant and unavoidable** for both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. ***(Similar)***

Impact 4.12-c: Temporary and Short-Term Exposure of Residents to Increased Traffic Noise Levels from Truck Hauling Associated With Borrow Activity

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities would occur; therefore, no potential exists for borrow hauling activity caused by the Phase 4b Project to directly increase traffic noise levels. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Repairs would result in a substantial increase in vehicle trips. It is unknown how a flood would affect roadways within the Natomas Basin, or if borrow material sites would be the same or in close proximity to those examined for the Phase 4b Project. Traffic noise levels, as a result of flooding in Natomas during a catastrophic flood, are unpredictable; therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction during all Phase 4b Project construction years would generate high volumes of haul truck trips for borrow activities on area roads, as shown on **Plate 2-6** and described in Section 4.10, "Transportation and Circulation." Associated traffic noise levels were estimated using the FHWA Federal Highway Traffic Noise Prediction Model (FHWA 1978) and are displayed in **Table 4.12-4**. These estimates are based on the amount of borrow material to be hauled, number of days of construction, and the hours per day in which hauling would occur.

As shown in **Table 4.12-4**, noise levels attributable to anticipated Phase 4b Project haul truck traffic would be approximately 66.4 dBA L_{eq}, 64.6 dBA L_{eq}, 59.1 dBA L_{eq}, 66.0 dBA L_{eq}, and 61.5 dBA L_{eq} at a distance of 50 feet from the roadway centerline for material hauled to Sacramento River east levee Reaches A:16–19A, Reaches A:19B–20, American River north levee Reach I: 1-4, NEMDC North west levee Reaches F–G, and PGCC west levee Reach E, respectively. An off-road haul route located at the landside toe of the Sacramento River east levee

would be used in Reaches A:16–20 of the Sacramento River east levee. Off-road haul routes would also be used to transport soil borrow material from the West Lakeside School Site, the Triangle Properties Borrow Area, and the Krumenacher Borrow Site/Twin Rivers Unified School District Stockpile Site, as shown on **Plate 2-6**. Because of limited space along Sacramento River east levee Reach A:19B–20, the off-road haul route along the landside levee toe may not support two-way haul truck traffic. To support one direction of the round trip, Gateway Oaks Drive and West El Camino Road may be used as on-road haul routes in addition to the off-road landside haul route. Alternatively, a single lane of Garden Highway from approximately Marina Glen Way to as far east as Gateway Oaks Drive may be used by haul trucks that would either be arriving from or returning to borrow sites (**Plate 2-6**). Residents located along these roadways would be exposed to increased roadway traffic due to haul traffic.

Table 4.12-4
Summary of Modeled Haul Truck Noise Levels[1]

Phase 4b Project Area	Number of One-Way Trips Required per Hour	Resulting Noise Level (dBA L_{eq} 50 Feet from Haul Route Centerline)
Sacramento River east levee Reach A:16–19A	108	66.4
Sacramento River east levee Reach A:19B–20	72	64.6
American River north levee Reach I:1–4	20	59.1
NEMDC North west levee (Reach F–G)	99	66.0
PGCC west levee (Reach E)	35	61.5

Notes: dBA = A-weighted decibels; L_{eq} = energy-equivalent noise level

[1] Traffic noise levels were modeled using the Federal Highway Traffic Noise Prediction Model (FHWA 1978). Calculated noise levels do not consider any shielding or reflection of noise by existing structures or terrain features or noise contribution from other sources. Estimates are based on the amount of borrow material to be hauled, number of days of construction, and the number of hauling hours per day as provided in Chapter 2, "Alternatives," and assuming a speed of 35 mph. See modeling results in **Appendix G** for further detail.

Source: Data compiled by AECOM in 2009

Because most of the project area roadways currently serve a limited volume of traffic, it is assumed that the modeled noise levels represent substantial increases compared to existing traffic noise levels. Not only would the Adjacent Levee Alternative (Proposed Action) result in substantially more vehicle trips on the off-road haul route along the toe of Sacramento River east levee Reach A:16–20 near residences and along public roadways with residences, but the vehicles would be predominantly haul trucks, which generate considerably more noise than passenger vehicles. Predicted traffic noise levels along haul routes related to construction in Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4 would exceed local exterior noise standards at landside and waterside residential land uses located along designated haul routes (**Plate 2-6**). Specifically, residences located along the landside haul route (Sacramento River east levee Reach A:16–20), Garden Highway (Sacramento River east levee Reach 19B–20), Gateway Oaks Drive, San Juan Road, Truxel Road, Northgate Boulevard, El Centro Road, and Powerline Road would experience an increase in traffic noise levels due to hauling activities. The closest residences to haul truck traffic are located along the landside of Sacramento River east levee (Reach A:19B–20, which would be used to haul soil borrow material from the South Fisherman's Lake Borrow Area and the West Lakeside School Site to the respective levee construction area east of I-80. Because some residences in Sacramento River east levee Reach A:19B–20 are located only 25 feet from the centerline of the proposed landside haul route, the occupants could experience haul truck traffic noise levels of up to 70.9 dBA.

Assuming a standard exterior-to-interior attenuation rate of 25 dBA for residential buildings with windows and doors closed, noise generated by haul trucks supplying material for the Sacramento River east levee improvements could result in maximum interior noise levels of 41.4 dBA L_{eq}. The 24-hour average exterior noise

levels (L_{dn}) associated with daily haul truck trips, assuming all haul trucks would be operational during a 16-hour day, would be 41.6 dB L_{dn}. Based on these results, haul truck noise levels are not expected to result in an exceedance of the interior noise standard of 45 dBA L_{dn}/CNEL for residential land uses established by Sacramento County, and the City of Sacramento for transportation noise sources, although they would exceed local exterior noise standards at residential land uses, as noted above. In addition, although hauling activity is expected to take place during daytime hours, because of the need to complete levee improvements outside of the flood season and because of other environmental constraints on project schedule, it may be necessary to conduct some hauling activity during some noise-sensitive early morning and nighttime hours, potentially resulting in sleep disturbance at nearby residences. For both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, this impact would be **potentially significant**. ***(Similar)***

Mitigation Measure 4.12-c: Implement Noise-Reduction Measures to Reduce the Impacts of Haul Truck Traffic Noise

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall ensure that the measures listed below are implemented at each work site during project construction to minimize construction traffic noise effects on sensitive receptors:

- All heavy trucks shall be equipped with noise-control (e.g., muffler) devices in accordance with manufacturers' specifications.
- All haul trucks shall be inspected before use and a minimum of once per year to ensure proper maintenance and presence of noise-control devices (e.g., lubrication, nonleaking mufflers, and shrouding).
- Before haul truck trips are initiated during a construction season on roads within 145 feet of residences (the 60-dBA noise contour of haul truck traffic), written notification shall be provided to the potentially affected residents identifying the hours and frequency of haul truck trips. Notification materials shall also identify a mechanism for residents to register complaints with the appropriate jurisdiction if haul truck noise levels are overly intrusive or occur outside the exempt daytime hours for the applicable jurisdiction.

Responsibility:	Project proponent(s) and construction contractors
Timing:	Before the start of construction activities

Implementing these measures would reduce interior and exterior noise levels generated by haul truck traffic that passes noise-sensitive receptors. However, the mitigated noise levels may not meet the applicable standards for local exterior noises for residential land uses. Therefore, implementing this mitigation measure would partially reduce the temporary and short-term traffic noise impacts from hauling activities, but not to a less-than-significant level because there are no other feasible mitigation measures available to fully reduce this impact. Thus, these impacts would remain **significant and unavoidable** for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. ***(Similar)***

Impact 4.12-d: Long-Term Increases in Project-Generated Noise

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for long-term increases in Phase 4b Project-generated noise. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Efforts to reconstruct the levee would depend on the extent and location of damage. Equipment such as pumping plants would likely be used, generating short-term noise. Upon completion of levee repairs, noise generation would not be substantially greater than in a no-action, no-flood scenario. However, a precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Proposed modifications to the RD 1000 Pumping Plants Nos. 1A and 1B along the Sacramento River east levee and Nos. 6 and 8 along the NEMDC; and the City of Sacramento Sump Pumps 160 (Sacramento River east levee Reach A:19B), 58 (American River north levee), and 102 (NEMDC west levee at Gardenland Park), would include raising and replacing discharge pipes; and replacing and relocating pumps and motors to the landward side of the Sacramento River east levee, American River north levee, and NEMDC west levee to make room for levee widening. These pumping station modifications would involve the long-term operation of noise-generating stationary equipment at new locations. Such equipment could result in noise levels in the range of 78–88 dBA at 3–5 feet from the source depending on the exact type and size (EPA 1971).

Any pumps that would be replaced as part of the proposed modifications would be larger pumps than are currently operating at these stations to provide enough horsepower needed to pump water through the raised pipes. Enclosure buildings would be included to house the electrical, control, and monitoring equipment. The only increase in stationary and area source noise associated with the proposed pump station modifications would be from additional mechanical equipment, such as an emergency standby generator. The generator would be used only during emergency situations and during monthly testing. Operational noise levels associated with proposed pumping station improvements would be in compliance with applicable performance standards at nearby receptors. Therefore, this impact related to long-term operational noise is considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.12-e: Temporary and Short-Term Exposure of People Working in the Project Area to Excessive Airport Noise Levels

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, people would not be working in the project area and workers would not be exposed to excessive Airport noise levels. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. If a flood were to occur, the location of workers reconstructing the levee would depend on the location of damage, therefore, there is no way to predict whether workers would be exposure to unacceptable noise levels. A precise determination of significance is not possible and cannot be made because

the extent of the magnitude of impact is unknown. Beeause of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The proposed realignment of and bank improvements to the West Drainage Canal under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative could expose construction personnel to excessive Airport noise levels beeause this work would be loeated within the 65 dB L_{dn}/CNEL Airport noise-level contours. The *Sacramento County General Plan* Land Use Compatibility for Airport Noise ehart (Sacramento County 1993b:21–23) lists a variety of land uses and the acceptable Airport noise levels applicable for each land use. Construction areas are not specifically stated in this list; however, it is assumed to fall in the category of industrial and manufacturing, which allows an acceptable airport noise level of up to 85 dB L_{dn}/CNEL. Construction areas would only be exposed to noise levels of up to 75 dB L_{dn}/CNEL. Therefore, construction areas would not exceed the recommended land use compatibility for Airport noise for the Phase 4b Project under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. These temporary and short-term impacts are considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

4.12.3 RESIDUAL SIGNIFICANT IMPACTS

No residual significant noise impacts would occur under the No-Action Alternative because there would be no noise impacts associated with the No Phase 4b Project Construction scenario, and impacts associated with the Potential Levee Failure scenario are too speculative for meaningful consideration; therefore, it is currently unknown what the residual impact would be. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, the adverse effects of both temporary and short-term exposure of sensitive receptors to construction noise and vibration and exposure of residents to increased traffic noise levels from hauling activity would be significant. Implementing Mitigation Measures 4.12-a through 4.12-c would reduce this impact, but not to a less-than-significant level, because the mitigation would not fully reduce exterior noise and vibration levels below established standards. Therefore, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would result in temporary and short-term significant and unavoidable impacts on noise-sensitive receptors (e.g., nearby residents).

4.13 RECREATION

4.13.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.13.1.1 METHODOLOGY

No recreational facilities exist along the PGCC, the NCC, or the interior drainage canals that are part of the Phase 4b Project and no institutionally recognized recreational activities or substantial recreational uses take place in or in the immediate vicinity of these areas. Therefore, the impact analysis is limited to Phase 4b Project areas where recreational facilities are located and/or recreational activities occur, which consist of the Sacramento River east levee, American River north levee, NEMDC, and associated borrow sites and construction staging areas where there are nearby recreational facilities.

4.13.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to recreation if they would do any of the following:

- 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;
- include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment;
- substantially restrict or reduce the availability or quality of existing recreational opportunities in the project vicinity; or
- implement operational or construction-related activities related to the placement of project facilities that would cause a substantial long-term disruption of any institutionally recognized recreational activities.

The Phase 4b Project would not increase population in the project footprint, and thus would also not increase the use of existing recreational facilities such that substantial physical deterioration would occur. Therefore, the first significance threshold does not apply and is not discussed further in this EIS/EIR.

4.13.2 IMPACTS AND MITIGATION MEASURES

Impact 4.13-a: Effects Related to the Proposed Natomas Levee Class 1 Bike Trail Project

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to have an adverse physical effect on recreational facilities or recreational uses. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Impacts to recreation and recreational facilities as a result of levee failure would be the same as described in Impacts 4.13-b and 4.13-c under the No-Action Alternative (Potential Levee Failure). Additionally, the proposed Natomas Basin Class I Bike Trail is not a flood damage reduction component and could be constructed separately from the NLIP. If a bike and recreational trail were to be constructed on or along the perimeter levees without the implementation of the NLIP levee improvements, that facility would be subject to damage in the event of levee failure. Because of the uncertainty of this scenario, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

A paved bicycle/pedestrian trail currently exists on the NEMDC west levee in the Ueda Parkway, between Sotnip Road and Garden Highway. A Class II bikeway (an on-street lane designated for the exclusive use of bicycles) is located on Garden Highway between Northgate Boulevard and Natomas Park Drive. The Garden Highway Bikeway becomes a Class I off-street facility at Natomas Park Drive and continues along portions of Garden Highway adjacent to the American River north levee and Sacramento River east levee to the Natomas Main Drainage Canal.

The Phase 4b Project includes a proposal to construct a regional Class I bicycle and pedestrian trail along the remainder of the Natomas Basin perimeter levees (**Plates 2-19** and **2-20**), either on top of the levee crown, adjacent to the levee, or a combination of both. It is referred to in this EIS/EIR as the proposed Natomas Levee Class I Bike Trail Project. In those locations where a Class I facility would not be feasible because of physical constraints, a Class II bicycle path would be constructed. The alignment of the trail in relation to the levees and roadway intersections would be determined through a separate engineering design process because it would be a separate project from the NLIP. Construction would take place at least one construction season after completion of the NLIP, and construction timing would depend on funding for design and construction. (See Section 2.3.4.5, "Natomas Levee Class 1 Bike Trail Project," for additional details).

Before selecting the final alignment of the proposed Natomas Levee Class 1 Bike Trail, SacDOT, Sutter County, and the City of Sacramento would consult with other agencies having authority or responsibilities for activities taking place on or in the vicinity of the affected levees, including RD 1000, SCAS, and the FAA. Once an alignment is selected and before approving a design, SacDOT (in consultation with Sutter County and the City of Sacramento) would conduct a project-level environmental review (pursuant to CEQA) of the proposed Natomas Levee Class 1 Bike Trail. All mitigation measures identified would be implemented. It is anticipated that construction of the proposed Natomas Levee Class 1 Bike Trail would result in environmental impacts similar to but less than those impacts already identified as a result of construction of the Phase 4b Project's levee improvements. Due to the uncertainty of the alignment, lack of detailed project information and anticipated impacts associated with construction, and the fact that neither USACE nor SAFCA would have control over the timing or implementation of required mitigation measures, it is not possible to reach a definitive impact conclusion in this EIS/EIR. Therefore, the proposed Natomas Levee Class 1 Bike Trail Project would likely result in temporary and short-term impacts that are considered **significant and unavoidable**. ***(Similar)*** In the long-term, the proposed Natomas Levee Class 1 Bike Trail Project would have a less than significant and beneficial impact on recreation.

If SacDOT, Sutter County, and the City of Sacramento cooperate in implementing the mitigation measures required for the Natomas Levee Class 1 Bike Trail Project, the impact would be classified as significant in the short term but eventually would be reduced to a less-than-significant level in the long term.

Mitigation Measure: No feasible mitigation is available at this time.

Impact 4.13-b: Permanent Disruption of Recreational Activities and Facilities

Table 4.13-1 summarizes potential temporary and permanent impacts of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative on public and private recreational facilities in and adjacent to the Phase 4b Project area.

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for this alternative to directly disturb recreational facilities. Conformance with USACE guidance regarding levee encroachments, however, could require removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee, American River north levee, and NEMDC west levee (see Impact 4.7-a, "Loss of Woodland Habitats"). Removal of woodlands on the waterside of the levees would have an adverse effect on recreational experiences of recreationalists at Sand Cove Park, Garden Highway Bikeway, Ueda Parkway, and the Sacramento River, including boaters, and fisherman and birdwatchers using the waterside of the levees. This would be a **significant impact**. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Recreational facilities, including boat ramps, a golf course, nature preserves, bike trails, and neighborhood parks could face temporary closure as a result of flooding not only affecting recreational facilities, but their usage. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

The Adjacent Levee Alternative (Proposed Action) would result in temporary and permanent impacts to a number of public and private recreational facilities adjacent to the Sacramento River east levee, American River north levee, and NEMDC west levee. Construction of the adjacent levee and seepage berms, and the expansion of the O&M and utility corridors would encroach on City parks, nature preserves, a private golf course, and an off-street bikeway. **Table 4.13-1** summarizes these impacts.

The encroachment onto Natomas Oaks Park (Sacramento River east levee Reach A:20) and the Bannon Creek Preserve (American River north levee Reach I:2) would require removal of trees, some of which are Heritage oak trees (see Impact 4.7-a, "Loss of Woodland Habitats"). Tree removal within nature preserves would affect certain activities such as bird watching, because many birds are dependent on trees. The Adjacent Levee Alternative's (Proposed Action's) woodland compensation components would require replanting certain areas with native riparian and valley oak woodland to compensate for loss of native oak woodlands in the Phase 4b Project area (see Section 2.3.4.2, "Woodland Compensation"). This woodland replanting may compensate partially for loss of park land and park amenities provided by the existing oak groves and natural areas. However, in accordance with the Public Park Preservation Act of 1971 (see Section 3.13.1.2, "State"), parkland compensation would need to provide land with comparable characteristics and of substantially equal size located in an area that would allow for use of the substitute park land by generally the same persons who used the existing park land. It is uncertain as to whether the amount of woodland compensation area located within the community of South Natomas would be commensurate with the number of trees removed from public parkland under the Adjacent Levee Alternative (Proposed Action). Additionally, it is uncertain as to whether these areas would be accessible to the public.

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
Bannon Creek Nature Preserve (City of Sacramento Department of Parks and Recreation)	American River north levee, landside of Reach 1:2	5.8-acre nature preserve	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The portion of the park not acquired for American River north levee improvements would likely be closed to the public during construction.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The O&M and utility corridors would encroach onto the park by approximately 50 feet, causing a loss of trees and a reduction in park area.
Costa Park Site (Park Site SN2) (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee, landside of Reach A:19A, Garden Highway and I-80	3.3-acre undeveloped, planned neighborhood-serving park	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The park site would be used as a construction staging area.	Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee, seepage berm, and O&M and utility corridors would encroach approximately 290 feet onto the park site from the toe of the existing levee. The reduction in area could make future park development infeasible. Fix-in-Place Alternative: Construction of the levee, seepage berm, and O&M corridor would encroach approximately 280 feet onto the park site from the toe of the existing levee. The reduction in area could make future park development infeasible.
Discovery Park and American River Parkway (Sacramento County)	American River north levee waterside Reaches 1:1–4	Boat ramp (Discovery Park), picnic areas, hiking and multi-use trails; east of the I-5 Bridge there is an equestrian staging area, and an archery range	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Construction along the Sacramento River east levee in Reach A:20 and along the American River north levee Reaches 1:1–4 would generate dust and noise. Access to the American River Parkway from Natomas Park Drive would be closed. Access to Discovery Park and to the American River Parkway via Richards Boulevard and Jibboom Street would remain open during construction. The area under the I-5 Bridge is not in a developed recreation area. Because of dense riparian vegetation, the construction area would not be visible from developed recreational areas located on either side of the I-5 Bridge within the Parkway. Repairs and upgrades to the American River north levee under the I-5 Bridge would be located near to a Nature Study Area, where Parkway users could be present. Construction noise and disturbance may disrupt these activities.	None

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
Egret Park	5145 Westlake Parkway, immediately east of the proposed West Lakeside School site and proposed borrow area	9.64-acre park site, with 4.65 acres of developed facilities including a 0.35-mile-long bicycle trail, multi-use turf area, and lake	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Both alternatives could potentially reduce public enjoyment of the park because of temporary dust and noise impacts from borrow activities at the proposed West Lakeside School site (located to the immediate west of the park).	None
Fisherman's Lake Parkway and Open Space (City of Sacramento)	Landside Natomas Central Drive at Po River Way	1.7-mile bikeway and open space	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Both alternatives could potentially reduce public enjoyment of the park because of temporary noise impacts generated by borrow hauling activities on Del Paso Road, to the immediate north of the park.	None
Garden Highway Bikeway	Waterside of the American River north levee in Reaches 1:1 and 1:2 and on the waterside and landside of the Sacramento River east levee in Reach A:20	1.25-mile trail from Natomas Park Drive to Natomas Main Drainage Canal; the trail follows the Natomas Main Drainage Canal north from the Sacramento River east levee Reach A:19B and 20	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Portions of the Bikeway located on the levee crown on the south side of Garden Highway on the American River north levee Reach 1:1–2 and Sacramento River east levee Reach A:20 would be temporarily affected by construction closures and may need to be reconstructed upon completion of construction.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: In Reach A:20 on the landside of the levee between Natomas Oaks Park and the NEMDC, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative (O&M corridor) would encroach on the Bikeway. Following construction of the Fix-in-Place Alternative, the Bikeway could be replaced in the O&M corridor. Fix-in-Place Alternative: Removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee in Reach A:20 and American River north levee in Reach 1:1–2 would diminish the quality of the recreational experience for users of the Bikeway in these areas.

Table 4.13-1
Impacts to Recreational Facilities and Park Lands in or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
Gardenland Park (City of Sacramento Department of Parks and Recreation)	Adjacent to the west levee of NEMDC South and Ueda Parkway, the City of Sacramento Sump Pump No. 102 is situated on the east side of the park	6-acre park with picnic facilities, ball field, volleyball and basketball courts, play areas, and restroom	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Temporary construction impacts because of City of Sacramento Sump Pump 102 work. The park would likely be closed to the public for one construction season.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Expansion or relocation of City of Sacramento Sump Pump 102 would potentially require permanent conversion of a portion of Gardenland Park.
Hansen Park (City of Sacramento)	350 Kelton Way (east side of NEMDC, landside)	Nature area, bicycle trail, approximately 3.5 miles of equestrian trail in the area including Dry Creek, Robla Creek, wetlands, and oak woodlands	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Potential for temporary impacts due to proximity to erosion repair on the waterside of the west bank of the NEMDC and other waterside work.	None
Johnson Park (City of Sacramento)	East side of NEMDC South, north of El Camino Avenue	26-acre softball field and parking	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: While there is potential for park users to be affected by temporary dust and noise from erosion repair work and construction at City of Sacramento Sump Pump 102 on the NEMDC west levee, the UPRR tracks located between the NEMDC and the park are a source of existing noise and the NEMDC east levee would shield the park from project construction. Therefore, temporary construction impacts are unlikely to affect park users' recreational enjoyment of the park.	None

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
McClellan Docks (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee Reach A:20 On the waterside of Garden Highway near the Natomas Main Drainage Canal	1.7-acre dock facility currently leased to the Drowning Accident Rescue Team (DART)	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Construction traffic delays on Garden Highway could delay emergency response to water-related accidents (see Impact 4.10-c, "Temporary Disruption of Emergency Service Response Times and Access").	None
Natomas Oaks Park (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee Reach A:20 landside; 2101 Gateway Oaks Drive (intersection of Garden Highway and Gateway Oaks Drive)	13.2-acre park with oak grove, interpretative center picnic area, parking area	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Under both alternatives, the portion of the park not acquired for levee improvements would be closed for one construction season. The park would potentially be used for a construction staging area.	Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee and O&M and utility corridors would encroach onto the park by up to 70 feet from the toe of the existing levee, resulting in a loss of oak trees from the preserve area (see Section 4.7, "Biological Resources"). Relief wells that may be located at the toe of the levee could also encroach onto park land. Fix-in-Place Alternative: Construction of the O&M and utility corridors would encroach by up to 55 feet from the toe of the existing levee, resulting in a loss of oak trees from the preserve area (see Section 4.7, "Biological Resources"). Relief wells that may be located at the toe of the levee could also encroach onto park land.
Niños Parkway (City of Sacramento Department of Parks and Recreation)	American River north levee (Reach I-4)	Linear parkway with soccer fields, volleyball courts, bikeway, picnic areas, and community garden	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Construction-related impacts of dust, noise, and public safety may require closure of the community garden for one construction season.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The adjacent levee and O&M and utility corridors would encroach onto the southern edge of the community garden. Impacts would include loss of vegetation adjacent to the levee and Garden Highway. Few, if any, garden plots would be permanently affected.
River View Marina (private-open to the public)	Sacramento River east levee Reach A:19 waterside	Marina, restaurant, and dock	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Waterside access to the marina would not be affected; however, landside access would be subject to construction traffic delays.	None

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
Riverbank Marina (private-open to the public)	Sacramento River east levee Reach A:20 waterside	Marina, boat dock/landing, three restaurants, and 200 boatslips	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Waterside access to the marina would not be affected; however, landside access would be subject to construction traffic delays.	None
Riverview Park (City of Sacramento)	501 Forestara Circle; near the intersection of El Centro and San Juan Roads	5.19-acre developed park with playground, 0.2-mile walking path, picnic area, and shade structure	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Both alternatives could potentially reduce public enjoyment of the park because of temporary dust and noise impacts from borrow activities at the South Fisherman's Lake Borrow Area (located approximately 1,000 feet west of the site) and from borrow hauling trucks using nearby El Centro Road and San Juan Road.	None
Sand Cove Park (City of Sacramento Department of Parks and Recreation)	Waterside of the Sacramento River east levee Reach A:19A, at 2005 Garden Highway	10.3-acre park with boat dock/landing, paved walkways, trails, and picnic facilities	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Access would be made difficult by traffic delays during construction, and construction-generated noise and dust would reduce public enjoyment of the park. This park would potentially be closed during construction for safety reasons. Construction-related impacts could include park closure or limitations on access.	Adjacent Levee Alternative (Proposed Action): None Fix-in-Place Alternative: Waterside vegetation would be removed, resulting in permanent impacts to the park and to the quality of the recreational experience for park visitors.
Shorebird Park (City of Sacramento Department of Parks and Recreation)	Sacramento River east levee Reach A:19B at Kittiwake Drive and Swainson's Way on the landside of the levee	2 acre-developed park with play equipment, picnic area with shelter, turf, and volleyball court	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The park would be closed for one construction season under both alternatives and would potentially be used for a construction staging area.	Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee and O&M and utility corridors would encroach onto park by 50 feet. The loss of area at this relatively small park would s reduce its recreational value. Existing landscaping and walkways located on the southern edge of the park would need to be redesigned and replaced. The levee and O&M and utility corridors would not preclude future use of the park for recreational uses.

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
				Fix-in-Place Alternative: Construction of the O&M and utility corridors under this alternative would not encroach as much as under the Adjacent Levee Alternative (Proposed Action); therefore, the park's recreational value would not be substantially reduced. Existing landscaping and walkways located on the southern edge of the park would need to be redesigned and replaced.
Swallows Nest Country Club (private, open to members)	Sacramento River east levee Reach A:19B, 2245 Orchard Lane on the landside of the levee	Private nine-hole golf course associated with a 53-acre adult community and country club	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The golf course would be closed for one construction season under both alternatives.	Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee would encroach approximately 35 feet onto the course, and the O&M and utility corridors would encroach another 30 feet onto the course, potentially requiring removal of two fairways and two golf holes located parallel to Garden Highway. Fix-in-Place Alternative: Construction of the O&M and utility corridors would encroach approximately 30 feet onto the course. The encroachment on the two fairways and two golf holes located parallel to Garden Highway could make this portion of the golf course unusable, depending upon final design.

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
Ueda Parkway (City of Sacramento)	On the crown of the NEMDC west levee between Arden-Garden Connector and Elkhorn Boulevard, along Dry Creek, and Robla Creek east of the NEMDC	12.5 miles of paved recreation trails primarily on the levee crowns; connection to American River Parkway and downtown Sacramento; neighborhood access points at various locations; facilities include a Class I bike trail along the crown of the NEMDC	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Erosion repair, waterside repairs, and repairs at City of Sacramento Sump Pump 102 would require temporary closures of the bike trail on the NEMDC levee crown. The bike trail would be demolished at the construction locations and reconstructed.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Vegetation removal (including potential removal of Heritage oak trees) on the waterside of the west levee of NEMDC south would adversely affect the recreational experiences for passive users (birdwatchers, fisherman, and hikers) of the Parkway.

Note: I-5 = Interstate 5; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; RV = recreational vehicle
Sources: Data compiled by AECOM in 2009 from City of Sacramento Department of Parks and Recreation 2009a and 2009b

Construction of the adjacent levee would encroach approximately 35 feet onto the privately owned Swallow's Nest Golf Course, and the O&M and utility corridors would encroach another 30 feet onto the course into an area that contains two golf holes and the associated fairways that parallel Garden Highway. The golf course is designed around the residences located in the 53-acre Swallow's Nest Country Club and it is unlikely that the course could be redesigned to allow relocation of the two holes and fairways because of the limited area available. The Adjacent Levee Alternative (Proposed Action) would substantially affect the viability of the nine-hole golf course and, thus, would limit recreational opportunities for residents of the Swallow's Nest Country Club and other golf course users.

The temporary closure of recreational facilities during construction, potential construction damage to recreational facilities, temporary diminishment of recreational experiences at nearby parks during construction, and permanent conversion of recreational facilities for construction of flood damage reduction facilities along with the loss of public and private park amenities would be a **significant** impact.

Fix-in-Place Alternative

The Fix-in-Place Alternative would result in temporary and permanent impacts to the same recreational facilities as would the Adjacent Levee Alternative (Proposed Action); however, the degree of impact would be somewhat reduced under this alternative because the footprint of this alternative, which would not include an adjacent levee, would be smaller and would not encroach as far onto adjacent properties as would the Adjacent Levee Alternative (Proposed Action) (**Table 4.13-1**). Under this alternative, however, the removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee, American River north levee, and NEMDC west levee would adversely affect recreational facilities and experiences in these areas, whereas this would not be the case under the Adjacent Levee Alternative (Proposed Action).

The temporary closure of recreational facilities during construction, potential construction damage to recreational facilities, temporary diminishment of recreational experiences at nearby parks during construction, and permanent conversion of recreational facilities for construction of flood damage reduction facilities along with the loss of public and private park amenities, and loss of recreational values on the waterside of the levees would be a **significant** impact. ***(Greater)***

Mitigation Measure 4.13-b: Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall provide compensation for loss of park land, park amenities, and park function, including, but not limited to, any loss of land at the undeveloped Costa Park site and replacement and/or relocation of the Garden Highway Bikeway, restoration of the Ueda Parkway Bike Trail, and restoration of parklands used for construction staging areas. The project proponent(s) shall consult with the City of Sacramento Department of Parks and Recreation to determine appropriate compensation. Compensation shall, at a minimum, replace parkland acreage at a 1:1 ratio, and shall provide for full restoration of park amenities such as Heritage oak trees, other landscaping, sports fields, bikeways, and related equipment and structures in accordance with the Public Parks Preservation Act of 1971.

The project proponent(s) shall compensate for loss of Heritage trees and native oak trees from within the City of Sacramento's public parks and open space areas. Heritage trees shall be replaced in accordance with Sacramento City Code, Title 12, Streets, Sidewalks and Public Places, Chapter 12.64 Heritage Trees. California native trees shall be replaced with like species. Priority shall be given to replacement plantings within the Natomas Basin on public park land or open space/natural areas accessible to the public. Second priority would be replacement in public park areas of North Sacramento located within the City. The project

proponent(s) shall consult with City of Sacramento Department of Parks and Recreation regarding the location of compensatory woodland plantings on City property, including but not limited to the City-owned portion of the Hansen Ranch property.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities
Enforcement:	City of Sacramento Department of Parks and Recreation

The owners of the private property upon which the Swallow's Nest County Club is situated would be compensated according to Uniform Relocation Assistance and Real Property Acquisition Policies Act for the acquisition of the portion of the golf course needed for project implementation (see Section 3.3, "Land Use, Socioeconomics, Population and Housing"). However, because the course is situated around an existing residential development, it is uncertain that the course could be redesigned to allow relocation of the two holes and fairways. Therefore, project encroachment would potentially result in the golf course being down-sized or eliminated all together. No feasible mitigation measures are available to compensate for the loss of recreational opportunities provided by the golf course; therefore, both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would result in a **significant and unavoidable** impact. ***(Similar)***

Implementing the above mitigation measure would reduce the project's impacts to public recreational facilities because the City would be compensated for loss of public parkland, park amenities, and park function. However, a significant impact would remain because of the time lag for replacement trees to reach a comparable size to existing trees (up to several decades for some trees and approximately 100 years for Heritage oaks). Because there are no feasible mitigation measures to fully reduce these impacts to a less-than-significant level, this impact would be **significant and unavoidable**. ***(Similar)***

The Fix-in-Place Alternative would also result in the permanent removal of waterside vegetation at Sand Cove Park and along the levees within the project area to comply with USACE levee vegetation guidance criteria. There are no feasible mitigation measures to fully reduce these impacts to a less than significant; therefore, impacts would remain **significant and unavoidable**. ***(Greater)***

Impact 4.13-c: Temporary Changes in Recreational Opportunities during Project Construction Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, the No-Action Alternative would not directly affect recreational opportunities in the project area. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Recreational facilities, bikeways, a private golf course, neighborhood parks, and nature preserves could face permanent closure as a result of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Table 4.13-1, above, summarizes the temporary construction-related impacts of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative on public and private recreational facilities in and adjacent to the Phase 4b Project area.

As described in Section 3.13, "Affected Environment," public and private recreational facilities are located in, adjacent to, or in close proximity of the Phase 4b Project area (see **Plate 3-7**). Those facilities located within and adjacent to the construction sites, including the Ueda Parkway Bike Trail, Shorebird Park, Costa Park Site, Natomas Oaks Preserve, Bannon Creek Preserve, and Ninos Parkway would be potentially temporarily encroached upon by construction activities. Some of these parks and park sites may also be used as construction staging areas and would be closed for one construction season, and until park repairs and restoration work is complete. For nearby recreational facilities, access may be restricted, and the quality of recreational opportunities could potentially be substantially reduced in the project vicinity as a result of noise, dust, traffic, and visual disturbance from construction and borrow activities. Recreationists visiting the Sacramento River and American River Parkways for passive recreational pursuits such as birdwatching or nature appreciation may experience disruption. **Table 4.13-1** lists the parks that would be affected by the Phase 4b Project and the potential impacts that would occur as a result of project construction.

Because of closures of parks and other recreational facilities in the project area, recreationalists would need to use nearby recreational facilities in South Natomas and North Natomas, or in other adjacent areas such as Discovery Park and the American River Parkway during construction. Bicyclists that normally use the Ueda Parkway bike trail and Garden Highway Bikeway would have to find alternative on-street routes through the area during construction.

Overall, changes in recreational opportunities during project construction activities would be a temporary, but **significant** impact. ***(Similar)***

Mitigation Measure 4.13-c(1): Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair of Damage to Recreational Facilities

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce temporary construction-related impacts on recreational opportunities in the project area:

- Before the start of construction, prepare a bicycle detour plan for all bicycle trails and on-street bicycle routes, including the Ueda Parkway Bicycle Trail and Garden Highway Bikeway, in consultation with the County and/or City of Sacramento Bicycle and Pedestrian Coordinator as applicable. The detour plan shall include posted signs clearly indicating closure points, detour routes, roadway markings to designate temporary bike lanes, and informational signs to notify motorists to share the roads with bicyclists. Signs shall be posted at major entry points for bicycle trails and routes to notify users of closure dates, points, and detours. The detour plan shall be in place before the start of construction and shall be maintained and implemented throughout the construction period.

- Upon completion of the levee improvements, coordinate with the City and/or County (where applicable) for the City and/or County (where applicable) to restore access and repair or reconstruct any construction-related damage to recreational facilities, including the Ueda Parkway Bicycle Trail and Garden Highway Bikeway.

Responsibility:	Project proponent(s)
Timing:	Prepare bicycle detour plan before the start of construction activities; implement the plan during construction; and coordinate with the applicable City and/or County after construction of the levee improvements to restore access and repair any construction-related damage
Enforcement:	Sutter County, Sacramento County, and/or City of Sacramento

Implementing this mitigation measure would reduce the temporary, construction-related impact to bicycle trails under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-significant** level because construction-related damage would be repaired or reconstructed; access restored; and detour routes, roadway markings to designate temporary bike lanes, and informational signs would be provided. ***(Similar)***

Mitigation Measure 4.13-c(2): Provide Construction Period Information on Recreational Facility Closures and Detours and Provide Detours for Alternate Routes to Marinas

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	The project proponent(s) shall provide public information through the media and on the project proponent's Web site regarding detours and alternative access routes to public and private recreational facilities affected by project construction. The project proponent(s) shall coordinate with the Sutter County, Sacramento County, and City of Sacramento Department of Parks and Recreation to make available information to the public regarding closure of public recreational facilities, detours, and alternate sites available.

Responsibility:	Project proponent(s)
Timing:	Before the start of, and during, construction activities
Enforcement:	Sutter County, Sacramento County, and City of Sacramento Department of Parks and Recreation

Implementing this mitigation measure would reduce the temporary impact from construction-related disruption of recreational opportunities under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative to a **less-than-significant** level. ***(Similar)***

4.13.3 RESIDUAL SIGNIFICANT IMPACTS

Impacts related to the proposed Natomas Levee Class 1 Bike Trail Project in the event of levee failure are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration.

Due to the uncertainty of the alignment, lack of detailed project information and anticipated impacts associated with construction, and the fact that neither USACE nor SAFCA would have control over the timing or implementation of required mitigation measures, it is not possible to reach a definitive impact conclusion in this EIS/EIR. Therefore, impacts resulting from the proposed Natomas Levee Class 1 Bike Trail Project would remain significant and unavoidable in the short term. If SacDOT, Sutter County, and the City of Sacramento cooperate in implementing the mitigation measures required for the Natomas Levee Class 1 Bike Trail Project, the impact would be classified as significant in the short term but eventually would be reduced to a less-than-significant level in the long term. Additionally, there would be a beneficial impact on recreation with the addition of a new bike trail.

Impacts related to long-term disruption of recreational activities and facilities and temporary changes in recreational opportunities in the event of levee failure are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action), short- and long-term impacts associated with the time lag for replacement trees to reach similar sizes to existing trees (several decades for some trees and approximately 100 years for Heritage oaks) and the encroachment on private recreational facilities that could result in loss of the Swallow's Nest Golf Course would remain significant and unavoidable.

The Fix-in-Place Alternative would result in a slightly lesser impact on adjacent recreational facilities on the landside of the levees, but would nevertheless result in the short- and long-term loss of park amenities and encroachment onto the Swallow's Nest Golf Course, that would potentially make the course unusable. This alternative would also result in the permanent removal of waterside vegetation at Sand Cove Park to comply with USACE levee maintenance requirements. Short- and long-term impacts would remain significant and unavoidable.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, the potential permanent loss of public park amenities provided by Heritage oak trees and other mature trees located on public park land within the community of South Natomas would be a significant and unavoidable impact.

4.14 VISUAL RESOURCES

4.14.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.14.1.1 METHODOLOGY

Evaluation of the project's potential impacts on visual resources was based on a review of scenic vistas and landscapes that could be affected by project-related activities. Visual contrasts were examined, which included evaluations of changes in form, size, colors, project dominance, view blockage, and duration of impacts. Other elements such as natural screening by vegetation or landforms, placement of the Phase 4b Project components in relation to existing structures, and likely viewer groups were also considered.

4.14.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to visual resources if they would do any of the following:

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

There are no designated state scenic highways in the project area (Caltrans 2007); therefore, this issue is not discussed further in this EIS/EIR.

4.14.2 IMPACTS AND MITIGATION MEASURES

Impact 4.14-a: Alteration of Scenic Vistas, Scenic Resources, and Existing Visual Character of the Project Area

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, an adjacent setback levee would not be built that could obstruct views of the Natomas Basin from Garden Highway. However, to comply with USACE guidance regarding levee encroachments, trees and vegetation would be removed from the landside and waterside of Sacramento River east levee Reach A:I6–20, the landside of American River north levee I:1–4, a portion of NEMDC South to the Arden-Garden Connector, and the landside and waterside of NEMDC South between Arden-Garden Connector and the NEMDC Stormwater Pumping Station. Up to 6 acres of waterside vegetation could also be removed from the American River north levee in the event that a variance from USACE levee vegetation guidance is not granted. The quality of the views of the waterside of the levees would be degraded for recreational users of the rivers, residents along the waterside of the Sacramento River east levee, Garden Highway users, and others in the Natomas Basin that may be near a site where any large trees are removed. That is because the crowns of many trees, such as large cottonwood and oak trees, and Heritage oaks on

the waterside or landside of the levees, are clearly visible from most parts of the Natomas Basin. Therefore, this is considered a **potentially significant** impact. ***(Greater)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Damage caused by flooding could result in damage to structures, vegetation, agricultural lands, and woodlands. Views available to residents and recreational users could lose aspects of visual coherence, vividness, and unity. However, if a levee failure were to occur, damage to visual resources would depend on extent and duration of a flood event and subsequent repair. In addition, if Garden Highway were destroyed by a flood event, access to views would no longer exist. However, if Garden Highway were to remain intact and usable, views within and surrounding the Natomas Basin would remain expansive and sweeping. Thus, while there could be substantial destruction to the existing visual character surrounding the Phase 4b Project area resulting from a catastrophic flood, if viewers are able to gain access to viewsheds, there would be no substantial degradation to the existing visual character. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action)

Existing views from Garden Highway follow a coherent line following trees, scattered residences, and agricultural lands into the Central Valley and beyond. These views are due to the elevation of Garden Highway, approximately 25 feet above the Natomas Basin in some areas. Under the Adjacent Levee Alternative (Proposed Action), a new levee would be constructed adjoining the existing Sacramento River east levee in Reach A:16–20. In these reaches, the existing levee already meets height requirements. Therefore, the top of the new levee would be no higher than the elevation of the existing levee crown, except in some locations where levee sections would be raised to accommodate raising of drainage discharge pipe crossings. In these select locations, the immediate view from Garden Highway would be not be altered because Garden Highway would also be raised to accommodate the pipe crossings. However, from some residences on the waterside of Garden Highway would be slightly altered by these raises.

Although the construction of an adjacent levee would allow for some of the mature riparian tree corridor along the waterside of the Natomas Basin levees to be retained, a substantial amount of landside vegetation would be removed. The Adjacent Levee Alternative (Proposed Action) would require the removal of all vegetation on the landside of the levee, including several woodland groves and individual trees, plus removal of vegetation within 15 feet from the toe of the levee/seepage berm on the landside of the Sacramento River east levee Reach A:16–20 (**Plates 2-7a** and **2-7b**) and along the American River north levee Reach I:1–4 (**Plate 2-9**). Many of the existing trees tower above the surrounding features and are striking, distinctive elements in local settings along the levee system, visible to residents on both sides of the levee and travelers along Garden Highway and other local roadways, including I-5. As reminders of the oak woodlands that formerly occupied much of the region, these trees have a high aesthetic value. Engineering refinements in Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4 may decrease the landside area that would be cleared of vegetation and may possibly reduce the number of trees that would need to be removed. Removal of riparian vegetation from the waterside of the Sacramento River east levee, however, would be visible to recreational users of the Sacramento River and residents on the waterside of the levee.

Tree removals would also take place along the landside of the west levee of the NEMDC North (**Plate 2-11**). The trees in this location are generally associated with residences that would be removed or relocated to accommodate the proposed levee expansion. On the waterside of the west levee of NEMDC South, some vegetation removal would potentially be required to accommodate erosion repair on the waterside of the levee near Dry Creek and Arcade Creek. In addition, to comply with USACE levee vegetation guidance, trees would be cleared both on the

landside of the west levee of NEMDC South (within the existing maintenance corridor) and on the waterside of the west levee, including all larger native trees that are located in the upper one-third of the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet) **(Plate 2-14)**. This would result in substantial adverse changes to the scenic character along the Ueda Parkway, which provides paved trails and access to natural areas along the west levee of NEMDC South.

No waterside vegetation would be removed to construct improvements to the American River north levee. However, under a worst-case scenario in which a variance from USACE levee vegetation guidance is not granted, up to 6 acres of waterside woodlands would be cleared. Although this waterside vegetation clearance would not encroach into the American River Parkway (defined to include the American River and adjacent floodplain) and affect adjacent Parkway lands that are designated as "Protected Land," in the American River Parkway Plan, the affected portion of the levee would be visible from within the Parkway and from adjacent roadways (Northgate Boulevard, Arden-Garden Connector). This would create a significant, long-term impact on visual resources in the American River Parkway.

The total extent of tree removal for the Adjacent Levee Alternative (Proposed Action) is described in **Table 4.7-2** and in Impact 4.7-a, "Loss of Woodland Habitat." As described in Section 2.3.4, "Habitat Improvements," the Landside Improvements Project would preserve and create woodland groves in the Natomas Basin near the Sacramento River east levee and in other areas near the Natomas Basin. **Table 4.7-3** shows the estimated long-term impacts of the Phase 4b Project on woodlands and total compensation included in all phases of the NLIP. Sites for woodland plantings would primarily be located on the landside of the Sacramento River east levee in Reach A:16 and along Lower Dry Creek east of the NEMDC.

In time, these new woodlands would enhance the visual qualities of the landscape; however, it would take several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed, which in some cases is likely 100 years old or older. The removal of the existing trees would substantially degrade the quality of scenic resources and the existing visual character and quality of local sites, including public parks, and their surroundings. These woodland impacts would be especially noticeable in public recreation areas and public natural open space areas where viewer sensitivity and concern are especially high. The Sacramento River east levee construction would remove oak trees from Natomas Oaks Park, and construction along the American River north levee would potentially remove trees from Bannon Creek Preserve. While the NLIP includes habitat compensation for loss of woodlands, the compensation would not be located within the public parks in the Natomas Basin. The loss of mature trees resulting from construction of the proposed levee improvements would contribute to a significant, long-term impact on visual resources in the Phase 4b Project area.

Levee modifications along the NEMDC North and the PGCC west levee, and work along the NCC including SR 99 bridge modifications and canal relocations, would not significantly alter the visual environment in these areas. These project features are not located in an area used for recreation or where viewer sensitivity is high. The levees are the dominant topographic features in these views, and the project would not result in a substantial change in the scenic character or quality of views in the area.

Habitat improvements associated with the West Drainage Canal relocation would include realignment of the western portion of the existing canal and bank improvements and the addition of a maintenance right-of-way on other parts of the existing canal (see **Plate 2-17**). In addition, the Brookfield borrow site would be converted to managed marsh and the adjacent Chappell Drain and Ditch would be improved. Because these improvements would take place at or below ground level, and would not substantially change the geometry of the canal, this component of the Phase 4b Project would have no long-term impact on visual quality. However, during construction, equipment would be visible to passersby and temporarily degrade scenic qualities.

Pump station modifications would also have the potential to alter visual resources in the Phase 4b Project area. The temporary construction activities and presence of construction equipment would substantially degrade the

visual character along the landside of the Sacramento River east levee, American River north levee, and the west levees of NEMDC South and NEMDC North. Upon completion of project construction, visual resource qualities and character would return to preexisting conditions in most cases; however, minor changes to adjacent areas may occur due to the modifications. Sump Pump 102 is located adjacent to the Gardenland Park, and any expansion or relocation of the pump station may result in adverse visual changes that would be noticeable to park users.

Implementation of the Natomas Levee Class 1 Bike Trail Project would not substantially alter visual resources in the project area. The paved trail would be constructed on or adjacent to the levees some time after the completion of the flood damage reduction facilities. Construction of the trail would not substantially alter the visual environment beyond the alterations that would occur with the construction of the adjacent levee, seepage berm, and other flood damage reduction facilities.

The proposed borrow operations would lower the elevation of borrow sites 2–6 feet over very large areas. The majority of the sites would be returned to pre-project conditions (e.g., field crops, fallow fields, rice, or grazing) (see Section 2.3.3.4 for details regarding borrow pit depth, area of excavation, and post-reclamation uses); the Brookfield Borrow Site would be converted to marsh habitat. The proposed elevation changes would not be discernible at the scale at which they would be implemented (hundreds of acres), and the proposed postconstruction land cover types would be consistent with adjacent land uses and overall land cover types in the surrounding portions of the Natomas Basin. Therefore, the long-term impacts of the borrow activities on visual resources would be less than significant. However, in the short term, the presence of construction equipment and the loss of vegetative cover would temporarily degrade the visual character of the borrow sites, resulting in a temporary and short-term significant impact.

While some may consider removal of vegetation as a means to decrease obstruction of views of the Central Valley, others may question the aesthetic value of a landscape consisting of agricultural land uses and whether these views are considered to be of high visual character or quality. Regardless of personal preference of what provides an aesthetically pleasing landscape, implementation of the Phase 4b Project would result in alterations to the existing visual character surrounding the Phase 4b Project area. Overall, because of the temporary presence of construction equipment and because of the permanent loss of mature trees on the landside of the levees in the Phase 4b Project area, including within public parks, the temporary and short-term, and long-term impacts to the existing and future visual character of the project area would be **significant**.

Fix-in-Place Alternative

As discussed above for the Adjacent Levee Alternative (Proposed Action), the existing levee already meets height requirements; therefore, the top of the new levee would be no higher than the elevation of the existing levee crown. Under the Fix-in-Place Alternative, the Sacramento River east levee Reach A:16–20 would be widened in place, but the resulting width of the levee next to Garden Highway would be less than under the Adjacent Levee Alternative (Proposed Action).

Under the Fix-in-Place Alternative, the Sacramento River east levee would be fixed in place, requiring removal of all riparian woodlands on the waterside of these levee reaches, in addition to the removal of all vegetation on the landside of the levee, plus an additional 15 feet from the toe of the levee/seepage berm to conform with USACE guidance regarding levee encroachments.

The total amount of tree loss that would result from the Fix-in-Place Alternative is described in **Table 4.7-2** and in Impact 4.7-a, "Loss of Woodland Habitat." Viewer sensitivity would be high for Sacramento River recreational users and for residents living on the waterside of the levee. This alternative would include offsetting the removal of trees with woodland planting; however, purchase of credits from a local mitigation bank would be necessary to fully offset the removal of trees from the waterside of the existing levee. Replacement of mature trees would take place beyond 15 feet of the landside levee toe, and these plantings would require several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed. Woodland compensation

efforts would not fully compensate for the extensive loss of mature waterside vegetation. The impacts would occur on a temporary and short-term, and long-term basis. The loss of high aesthetic qualities due to removal of mature waterside vegetation combined with high viewer sensitivity of recreational users of the Sacramento River and residents on the waterside of the levee would be a **significant** impact. ***(Greater)***

Mitigation Measure 4.14-a: Implement Mitigation Measures 4.7-a, "Minimize Effects on Woodland Habitat; Implement all Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions," and 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat; Implement all Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions," set forth in full in Section 4.7, "Biological Resources," to reduce the project's impacts to visual resources in the Natomas Basin. This mitigation measure includes identifying native woodland areas and minimizing disturbance of such areas to the extent feasible during construction; coordinating with the resource agencies to prepare a project-specific MMP and to append the programmatic LTMP to ensure the creation and long-term management of these components before construction commences; identifying waterside riparian woodland in the project footprint that provides SRA habitat functions and minimizing disturbance of such areas to the extent feasible during construction; replacing waterside riparian forest and scrub (canopy acreage) at ratios established by NMFS and monitoring progress with performance criteria; and entering into agreements with the appropriate local entity responsible for long-term management of created woodland habitats and long-term management of created SRA habitats, and ensuring all terms and conditions of these agreements are implemented.

The project proponent(s) shall implement Mitigation Measure 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities," set forth in full in Section 4.13, "Recreation," to reduce the project's impacts to visual resources in public parks and open space areas. This mitigation measure includes compensating for loss of park land, park amenities, and park function and replacing and/or relocating the Garden Highway Bikeway; consulting with the City of Sacramento Department of Parks and Recreation to determine appropriate compensation, which shall, at a minimum, include replacement of parkland acreage at a 1:1 ratio and restoration of park amenities such as Heritage oak trees, other landscaping, sports fields, bikeways, and related equipment and structures; and compensating for loss of Heritage trees and native oak trees from within the City of Sacramento's public parks and open space areas.

Responsibility: Project proponent(s)

Timing: Implement Mitigation Measure 4.7-a before construction activities begin and implement Mitigation Measure 4.13-b immediately after construction activities are completed at each affected public park and open space area

Implementing these measures would reduce the impacts of visual resource degradation through replacement tree plantings, but not to a less-than-significant level because there are no feasible mitigation measures to fully reduce the magnitude of this impact because of the engineering requirements of the levee improvements and USACE vegetation removal requirements; therefore, this impact would remain **significant and unavoidable**. ***(Similar)***

Impact 4.14-b: New Sources of Light and Glare that Adversely Affect Views

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to change light and glare along the perimeter levee system. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Damage to the infrastructure in the Natomas Basin could result in a short-term decrease in nighttime lighting due to power outages. However, depending on the extent and location of levee failure and subsequent flood damage, emergency lighting could be required for nighttime security and construction. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered to be **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

No new permanent sources of light or glare would be associated with the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative; however, equipment staging areas would be lit as necessary for security reasons during construction. Cutoff wall construction would be conducted 24/7, except in the urbanized area east of the I-80 overcrossing, where construction would be restricted to daytime hours. Some landside areas may be screened from construction areas by trees, depending on tree height and proximity to the construction areas, and proximity of residences to the construction area. Where residences are present on the waterside of the levee, the existing levee itself, trees, and other vegetation could partially shield residences from lighting used on the landside of the levee, where the work would be performed. Security night lighting also would be provided at the modified pumping plants, although they would be situated such that no residences would be affected by this source of night light. Construction work would typically move in a linear fashion along the levees, and construction activities generally would not take place in any one location for more than a few weeks. Therefore, where nighttime construction lighting (if needed) would be clearly visible from nearby residences, the activity would be a temporary impact. This potential temporary impact would be periodic during some nighttime hours, last only several weeks, would not constitute a substantial source of light or glare, and is considered to be a temporary less-than-significant impact.

Construction of the cutoff walls west of the I-80 Bridge (Reach A:16–19A of the Sacramento River east levee) and along the west levee of NEMDC North may require substantially more nighttime construction and lighting than presented above, including construction activities potentially being conducted 24/7, in which case security and construction night lighting would be used continuously. Rural residences in these reaches would be exposed to continuous nighttime lighting as cutoff wall construction is advancing along the levee, creating a new source of substantial light or glare that would adversely affect nighttime views in the area. This would be a temporary but **significant** impact. ***(Similar)***

Mitigation Measure 4.14-b: Direct Lighting Away from Adjacent Properties

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce the impacts of light and glare associated with project construction activities:

- Require that nearby residents to construction activities be notified in advance of any nighttime construction activities.
- Require that construction and security lighting be shielded and directed downward to minimize the spill of light onto adjacent properties.

Responsibility: Project proponent(s)

Timing: Notify nearby residents before the start of nighttime construction activities, and require that lighting be shielded and directed downward during construction activities

Implementing these measures would reduce the impacts of light and glare for nearby residents by shielding nighttime lighting downward away from residences, but not to a less-than-significant level. Therefore, this impact would remain **significant and unavoidable** because there are no feasible mitigation measures to fully reduce the magnitude of this temporary construction-related impact. ***(Similar)***

4.14.3 RESIDUAL SIGNIFICANT IMPACTS

Impacts related to degradation of visual resources in the project area in the event of levee failure are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, adverse temporary impacts on visual resources due to construction activities and equipment on the levees would be significant. Mitigation Measure 4.14-b includes measures to screen residences from construction sites and equipment staging and storage areas that would reduce these impacts, but screening may not be feasible at all construction locations; therefore, the impact would remain significant and unavoidable. Similarly, for visual degradation due to light and glare, screening and directing lighting away from adjacent properties would reduce the impacts of light and glare for nearby residents, but not to a less-than-significant level; therefore, this impact would remain significant and unavoidable.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, adverse effects on scenic resources and visual character of the Sacramento River east levee, American River north levee, and NEMDC South resulting from the removal of a substantial number of trees, including large mature trees and Heritage oaks, from the landside and waterside of these levees, would be significant. The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative include measures to limit the extent of impacts on visual resources caused by the short-term loss of woodland areas (e.g., temporary fencing installed during construction to prevent disturbance of native trees that are located adjacent to construction areas but can be avoided) and to offset them over the longer term (through substantial woodland planting). No feasible mitigation, however, is available to reduce the short-term impacts from Impact 4.14-a to a less-than-significant level; thus, this impact would remain significant and unavoidable in the short term.

For the Adjacent Levee Alternative (Proposed Action), with the new acres of woodland plantings that would be installed as described in Section 4.7, "Biological Resources," the impact would be reduced over the long-term, but

not to a less-than-significant level. Because of the loss of visual resources and visual quality within highly sensitive public parks, this long-term impact would remain significant and unavoidable.

With the Fix-in-Place Alternative, mitigation measures would not be sufficient to fully mitigate impacts on woodland habitats as a result of the loss of waterside and landside vegetation. The long-term impact would remain significant and unavoidable under the Fix-in-Place Alternative, but would have a greater residual impact than would the Adjacent Levee Alternative (Proposed Action).

4.15 UTILITIES AND SERVICE SYSTEMS

4.15.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.15.1.1 METHODOLOGY

Impacts on utilities and service systems that would result from project implementation were identified by comparing existing service capacity and facilities against project implementation. Evaluation of potential utility and service systems impacts was based on a review of documents pertaining to the Natomas Basin. Additional information was obtained through consultation with appropriate agencies, such as Sacramento Regional County Sanitation District, Sacramento Municipal Utility District, Pacific Gas and Electric Company, and NCMWC.

4.15.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to utilities and service systems if they would do any of the following:

- exceed wastewater treatment requirements of the applicable regional water quality control board;
- require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- exceed water supplies available to service the project from existing entitlements and resources, such that new or expanded entitlements would be needed;
- result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- generate waste materials that would exceed the permitted capacity of local landfills or fail to comply with Federal, state, and local statutes and regulations related to solid waste; or
- result in substantial adverse physical impact associated with the provision of new or altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for public services such as fire protection, police protection, schools, or parks.

The Phase 4b Project would not involve any changes in land use that would increase short- or long-term demand for public services, including fire and police protection, schools, parks, and other public facilities, thus necessitating the construction of new or altered government service facilities. Similarly, the Phase 4b Project would not result in demand for increased natural gas facilities, electrical transmission lines, communication systems, water infrastructure, sewer lines, or solid-waste services beyond their current capacity. Therefore, thresholds related to increasing demands on existing public services and utilities do not apply to this analysis and are not addressed further in this EIS/EIR.

4.15.2 IMPACTS AND MITIGATION MEASURES

Impact 4.15-a: Potential Temporary Disruption of Irrigation Water Supply

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to cause construction-related disruption to irrigation water supply. There would be **no impact**. *(Lesser)*

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could cause flooding that would damage canals, potentially disrupting irrigation of cropland. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related effect on these services cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. *(Currently Unknown)*

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 2.3.3.3, "Irrigation and Drainage Components," modifications to irrigation infrastructure would involve relocation or realignment of features located within the Phase 4b Project footprint. Irrigation and pipeline penetrations affecting the levee prism would be raised, as necessary, to meet current USACE and CVFPB regulations. Wells and pumps in the footprint of the proposed flood damage reduction facilities would be removed and replaced in locations farther from the project footprint. Relocated and realigned irrigation facilities would be replaced with in-kind structures compatible with the new levee footprint. The timing of these replacements would be planned, to the extent feasible, to prevent disruption of service (e.g., the Riego Road Canal would be functional before the existing canals are demolished).

Substantial temporary interruptions of irrigation supply could occur if irrigation infrastructure is damaged or otherwise rendered inoperable at a time when it is needed (e.g., reconnections to water supply sources are not completed by the time crop irrigation must begin). Given the extent and intensity of project construction activities, it is possible that these activities could impede the repair of damaged infrastructure or cause a delay in the provision of irrigation supply. This temporary impact is considered **potentially significant**. *(Similar)*

Mitigation Measure 4.15-a: Coordinate with Irrigation Water Supply Users Before and During All Irrigation Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) and its primary contractors for engineering design and construction shall ensure that the measures listed below are implemented to minimize the potential for irrigation water supply interruptions during construction activities.

- Coordinate the timing of all modifications to irrigation supply infrastructure with the affected infrastructure owners and water supply users, either directly or through NCMWC.

- Include detailed scheduling of the phases of modifications/replacement of existing irrigation infrastructure components in project design and in construction plans and specifications.
- Plan and complete modifications of irrigation infrastructure for the nonirrigation season to the extent feasible.
- Provide for alternative water supply, if necessary, when modification/replacement of irrigation infrastructure must be conducted during a period when it would otherwise be in normal use by an irrigator.
- Ensure either that (1) users of irrigation water supply do not, as a result of physical interference associated with the project, experience a substantial interruption in irrigation supply when such supply is needed for normal, planned farming operations (i.e., a decrease in level of service in comparison with the existing level of service); or (2) users of irrigation water supply that experience a substantial decrease in an existing level of service that meets the established standards for the project area are compensated in kind for losses associated with the reduction in level of service.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities

Implementing this mitigation measure would reduce the potential temporary impact of disruptions to irrigation supply to a **less-than-significant** level because the project proponent(s) would coordinate with water supply providers and consumers to minimize interruptions, would conduct work during the nonirrigation season whenever feasible, and would ensure that essential water supply necessary during the irrigation season is provided by an alternative supply if an interruption is unavoidable. ***(Similar)***

Impact 4.15-b: Potential Disruption of Utility Service

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to disrupt utility service. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in minor to substantial flooding that could substantially interrupt utilities and public services, including natural gas facilities, electrical transmission lines, communication systems, water infrastructure, sewer lines, or solid-waste services. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related impact on these services cannot be predicted. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Phase 4b Project includes relocation of power lines and other utility infrastructure located within the project footprint, including the levee prism, in accordance with USACE and CVFPB guidance. To the extent feasible, mainline utility infrastructure, such as power poles, would be relocated beyond the landside levee toe (i.e., Sacramento River east levee Reaches A:16–19A); however, due to the high concentration of residential units near Sacramento River east levee Reaches A:19B–20, a utility corridor may be constructed on the waterside of the levee. Existing main electrical power transmission lines and poles on the waterside of the existing Garden Highway levee that do not need to be relocated or replaced to accommodate the project may be left in place. No new main electrical power transmission lines and poles would be installed on the waterside of Garden Highway in Sacramento River east levee Reaches A:16–18. Detailed project design would include consultation with all known service providers to identify specific infrastructure locations and appropriate protection measures. Consultation would continue during construction to ensure avoidance/protection of facilities as construction proceeds to minimize service disruptions. Where feasible, replacement utility structures would be completed before demolition of existing facilities.

Although steps would be taken to minimize potential impacts to utilities , project construction activities, including grading and excavation, could damage identified and unidentified utility equipment and facilities. In addition, required relocation of existing utilities could result in interruptions in service. Furthermore, the extent and intensity of project construction activities could affect service providers' abilities to quickly repair damage and/or restore interrupted service. This temporary impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.15-b: Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before construction begins, the project proponent(s) and its primary contractors shall coordinate with CVFPB and applicable utility providers to implement orderly relocation of utilities that need to be removed or relocated. If SAFCA is the project proponent instead of USACE, SAFCA shall coordinate with USACE, as well as CVFPB. Power pole relocations shall be coordinated with SMUD. Consistent with sound engineering practices that prioritize the following, individual service lines shall: (1) use existing configurations and facilities to the extent feasible, (2) place any new poles on the landside of Garden Highway to the extent feasible, subject to the approval of USACE (only if SAFCA is the project proponent), CVFPB, and any other pertinent regulatory public agency and utility company; and (3) if waterside poles are necessary on the Sacramento River east levee in Reaches A:19B–20, any such relocation of utilities would be subject to the approval of USACE (only if SAFCA is the project proponent), CVFPB, and any other pertinent regulatory public agency and utility company. The project proponent(s) and its primary contractors shall provide the following:

- Notification of any potential interruptions in service shall be provided to the appropriate agencies and affected landowners.
- Before the start of construction, utility locations shall be verified through field surveys and the use of the Underground Service Alert services. Any buried utility lines shall be clearly marked in the area of construction on the construction specifications in advance of any earthmoving activities.
- Before the start of construction, a response plan shall be prepared to address potential accidental damage to a utility line. The plan shall identify chain of command rules for notification of authorities and appropriate actions and responsibilities to ensure the safety of the public and workers. Worker education training in response to such situations shall

be conducted by the contractor. The response plan shall be implemented by the project proponent(s) and its contractors during construction activities.

- Utility relocations shall be staged to minimize interruptions in service.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities

Implementing this mitigation measure would reduce the impact from disruption of utility services to a **less-than-significant** level because the project proponent(s) and its primary contractors would coordinate with utility service providers and consumers to minimize interruptions to the maximum extent feasible, and a response plan to address service interruptions would be prepared and implemented. ***(Similar)***

Impact 4.15-c: Increases in Solid Waste Generation

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, there would be no increase in solid waste generation related to project implementation. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Cleanup operations following flooding would generate very high levels of solid waste; the amount of waste would depend on the extent, depth, and duration of flooding and the types of property damaged. Waste materials could exceed the permitted capacity of local landfills or fail to comply with Federal, state, and local statutes and regulations related to solid waste. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

There would be virtually no short- or long-term generation of solid waste associated with project operation. Temporary project construction activities would generate up to 100,000 cubic yards of solid waste during construction of the Phase 4b Project. Sources of solid waste related to construction activities would include cleared vegetation and structural debris from removal of agricultural structures and residences located within the project footprint. Waste materials resulting from degradation of existing levees would be hauled off-site and not used for construction. Other materials, such as asphalt, concrete, pipes, and gravel, would be removed from the footprint of the proposed flood damage reduction facilities.

Waste materials (including cleared vegetation) would be hauled off-site to a suitable disposal location. Excess earth materials (organic soils , roots, and grass from borrow site s and the adjacent levee foundation; and excavated materials that do not meet levee embankment criteria) would be used in the reclamation of borrow sites or hauled off-site to a suitable disposal location. Hazardous materials (e.g., building materials containing lead paint or asbestos) encountered during the removal of residences and other structures would be disposed of in accordance with regulatory standards (see Mitigation Measures 4.16-b[1] and 4.16-b[2] in Section 4.16, "Hazards and Hazardous Materials "). The location of the landfill used for disposal of spoil material and other construction-related waste would be determined by the construction contractor at the time of construction activity based on

capacity, type of waste, and other factors. Only those landfills determined to have the ability to accommodate the construction disposal needs of the alternatives would be used. It is likely that Kiefer Landfill, owned and operated by Sacramento County, would be used for all or a part of the construction waste. Kiefer Landfill, which accepts 10,815 tons per day (TPD) of solid waste, is located about 15 miles southeast of the city of Sacramento (approximately 16 miles southeast of the intersection of Northgate Boulevard and Garden Highway). With a permitted capacity of more than 117 million cubic yards through 2035 and a remaining capacity of nearly 113 million cubic yards as of 2005 (California Integrated Waste Management Board 2009), Kiefer Landfill would be able to accommodate the project's construction disposal needs. Similarly, the Western Regional Landfill in Placer County, approximately 10 miles from the PGCC , would be able to accommodate the project disposal requirements. The Western Regional Landfill accepts 1,900 TPD, with a maximum permitted capacity of more than 36 million cy and a remaining capacity of more than 29 million cy (California Integrated Waste Management Board 2009). Project construction and operation would not cause existing regional landfill capacity to be exceeded; therefore, this impact is considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

4.15.3 RESIDUAL SIGNIFICANT IMPACTS

Impacts associated with disruption to irrigation supply and utility services, and increases in solid waste generation as a result of the No-Action Alternative, are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Mitigation measures described above for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would reduce the impacts of a potential temporary disruption of the irrigation supply and the provision of other utility services to less-than-significant levels; therefore, there would be no residual significant impacts.

4.16 HAZARDS AND HAZARDOUS MATERIALS

4.16.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.16.1.1 METHODOLOGY

This section addresses potential sources of hazards and risks associated with hazardous materials that may be associated with implementation of the Phase 4b Project. This analysis was based on a search of the California Department of Toxic Substances Control (DTSC's) Envirostor database and SWRCB's Geotracker database, and a review of *Natomas Levee Improvement Program Initial Site Survey and Phase I Environmental Site Assessment, Volumes 8 and 13* (Kleinfelder 2009a).

Evaluation of the project's potential impacts on Airport safety was based on a review of the regulations pertaining to the Phase 4b Project area, including the Airport's WHMP (SCAS 2007), FAA's Advisory Circular (AC) 150/5200-33B on hazardous wildlife attractants on or near airports (FAA 2007), and Part 77 of the Federal Aviation Regulations.

Potential sources of wildfire hazards and risks associated with implementation of the Phase 4b Project were also evaluated. This evaluation was based on a review of historic local weather conditions, historic ignition sources, topography, vegetation, and fire history. Fire hazard severity zones, which are established by the California Department of Forestry and Fire Protection, were identified and compared to the Phase 4b Project area.

4.16.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to hazards and hazardous materials if they would do any of the following:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- be located on a site that is included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- result in a safety hazard for people residing or working in a project area that is located within 2 miles of a public airport or public-use airport; or
- result in a significant impact related to wildfire hazards if they would expose people or structures to a significant risk of loss, injury, or death from wildland fires.

There are no established thresholds for wildlife strikes. For this analysis, airport safety was analyzed within the Airport Perimeter B and the Airport Operations Area. The FAA recommends a separation distance of 10,000 feet between the Airport Operations Area and hazardous wildlife attractants (FAA 2007); this area is identified as the Airport Perimeter B. Additionally, the FAA recommends a distance of 5 statute miles between the farthest edge of the Airport Operations Area and hazardous wildlife attractants (FAA 2007).

4.16.2 IMPACTS AND MITIGATION MEASURES

Impact 4.16-a: Accidental Spills of Hazardous Materials

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities and thus no accidental spills of hazardous materials related to this project would occur. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could upset stored hazardous materials and spread agricultural pesticides, oil, gasoline, and other hazardous materials in flood waters, creating hazardous conditions for the public and the environment. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Project-related construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels (gasoline and diesel), oils and lubricants, and cleaners (which could include solvents and corrosives in addition to soaps and detergents), that are commonly used in construction projects. Bentonite (a nonhazardous material) and/or cement would be used where cutoff walls are being constructed to remediate levee seepage conditions. Construction contractors would be required to use, store, and transport hazardous materials in compliance with Federal, state, and local regulations during project construction and operation. Risks to water quality associated with incidental releases of these materials on project sites are addressed in Section 4.6, "Water Quality."

Compliance with the applicable regulations would reduce the potential for accidental release of hazardous materials during their transport and during project construction activities. Consequently, the risk of significant hazards associated with the transport, use, and disposal of these materials is low. This temporary impact is considered **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.16-b: Potential Land Use Constraints Due to Contamination within the Pumping Plant No. 8 Footprint and Potential Exposure of Construction Workers and the General Public to Contaminated Groundwater

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur, thus the project proponent(s) would not be required to consider land use constraints related to contamination within the footprint of Pumping Plant No. 8. Neither construction workers nor the general public would be potentially exposed to groundwater contamination. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. However, in the event of a catastrophic flood, the magnitude and location of a potential levee breach is not predictable and therefore a determination of significance is not possible. It is unknown if a flood event would affect agency-listed hazardous materials sites. This impact is considered to be **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 3.16.2.1, "Database Search," one Cortese-listed site is located within the construction footprint for Pumping Plant No. 8: the Olympian Oil site located at 4422 Northgate Boulevard (see **Plate 2-14**). Initial monitoring in 2005 indicated that groundwater had been contaminated with gasoline range organics, methanol, MTBE, tert-butyl alcohol, and toluene. The most recent quarterly sampling results available from June 21, 2009 indicate that two of the monitoring wells contain MTBE above the reporting limit. No other chemical constituents were reported (McCampbell Analytical 2009). Quarterly monitoring of groundwater was still required at the time of release of this DEIS/DEIR.

The property owner, Olympian Oil, is required to operate and maintain the monitoring wells and conduct other required remediation activities. As noted above, the proposed Pumping Plant No. 8 footprint overlaps with the Olympian Oil site boundary. Construction activities associated with Pumping Plant No. 8 would include raising and replacing the discharge pipes within the waterside bench. Excavation, dewatering, and ground-surface-level construction could destroy monitoring structures or impede access to monitoring equipment and potentially expose construction workers to contaminated groundwater. Therefore, this temporary impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.16-b: Cooperate with Olympian Oil and Regulatory Agencies to Preserve, Modify, or Close Existing Groundwater Monitoring Wells at the Olympian Oil Site

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) that would implement modifications to Pumping Plant No. 8, which would be located within the Olympian Oil site boundary, shall submit copies of plans and specifications to Olympian Oil, Sacramento County, and the Central Valley RWQCB for coordination purposes. The project proponent(s) shall coordinate with Olympian Oil or any successor, Sacramento County, and the Central Valley RWQCB to establish and implement the preservation, modification, or closure of existing groundwater monitoring wells that will interfere with project implementation. Construction shall not proceed within the Olympian Oil site boundary or on lands used for groundwater monitoring and other remediation activities until Sacramento County and the Central Valley RWQCB have approved Olympian Oil's or a successor's plan for well preservation, modification, or closure. Preservation,

modification, and/or closure of monitoring wells would remain the responsibility of Olympian Oil or successor.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities on Pumping Plant No. 8

Implementing this mitigation measure would reduce potentially significant land use constraints due to contamination on the Olympian Oil site which is listed on the Cortese List to a **less-than-significant** level under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative because remediation activities would continue as required by Sacramento County and the Central Valley RWQCB, and coordination with responsible parties would ensure that necessary measures would be taken to avoid damage to monitoring wells or expose construction workers and/or the general public to contaminated groundwater.

Impact 4.16-c: Potential Exposure of Construction Workers and the General Public to Hazardous Materials Encountered at Project Sites

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to expose the general public and/or construction workers to hazardous materials encountered at project sites. The Natomas Basin is largely agricultural and this type of land use can often involve the application of pesticides, residues of which may remain in soils for years. Humans may be exposed to these potentially hazardous materials through direct contact with soil, groundwater leaching, or exposure to airborne dust created by typical agricultural crop management practices, such as discing. Plants and animals may be exposed to these potentially hazardous materials through contact with surface soils or through contact with stormwater or irrigation runoff that could carry the materials into ponds, drainages, and other waterways. Because of this risk, the continued presence of pesticide residues and the existing levels of arsenic in soil on land used for agricultural purposes are considered to be a **potentially significant** impact. ***(Similar)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding known sites of hazardous materials, potentially exposing the public and the environment to both known hazardous conditions (discussed in Section 3.16, "Hazards and Hazardous Materials") and potentially unknown hazardous conditions in areas that have not been evaluated under a Phase I and/or II Environmental Site Assessment (ESA). Underseepage and boils, resulting from high river stages, may force groundwater to the surface within or adjacent to areas containing pesticide residues or contaminated soils. This could transport sediments containing hazardous materials from agricultural fields into waterways. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 3.16, "Hazards and Hazardous Materials," Phase I ESAs have been completed for a small portion of the Phase 4b Project footprint, and are limited to six parcels located along the PGCC west levee. The Phase I ESAs disclose the potential presence of potentially hazardous materials, including possible asbestos,

aboveground storage tanks (ASTs), oil and gas wells; PCBs in pole-mounted transformers, and pesticide-impacted soils from historic agricultural use (Kleinfelder 2009a). See Section 3.16, "Hazards and Hazardous Materials," for the site-specific conditions at each Assessor's Parcel Number (APN) included in the Phase I ESAs. The remainder of the Phase 4b Project footprint has not been evaluated for the potential presence of hazardous materials.

It is possible that former land uses, particularly agricultural use, may have resulted in a release of hazardous materials onto the Phase 4b Project site. In addition, as described in Section 3.16.2.3, "Land Use Associated Hazards," previous soil testing conducted for the Phase 4a Project indicate the presence of elevated concentrations of some pesticides used historically in the Basin. Project demolition and relocation activities may create a potential for construction workers or other people to be exposed to hazardous materials associated with existing and former agricultural and rural residential structures. These materials may include asbestos in underground pipelines, asbestos and lead-based paint in building materials, and/or PCBs in pole-mounted transformers. Some contaminants could be found within the project footprint that exceed pertinent ecological risk levels. Similarly, concentrations of particulates of concern in the air at the project fenceline and adjacent to residential property during construction activities could occur. Because not all areas of the Phase 4b Project footprint have been evaluated for the potential presence of hazardous materials, which are fairly likely to be present because of past and present agricultural use of the area, this impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.16-c(1): Complete Recommendations Included in Phase I and/or II ESAs and Implement Required Measures

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of any construction activities, the project proponent(s) shall ensure that all recommendations from the Phase I ESAs, listed below, are implemented by the applicable property owner(s) in coordination with all Federal, state, and local regulatory agencies and in compliance with all Federal, state, and local laws and regulations:

APN 35-080-022: Conduct a Phase II ESA to evaluate stained soil found on the site and the contents of unlabeled containers located on the site if these areas will be used for the Phase 4b Project. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-120-007: Conduct a Phase II ESA to evaluate stained soil and the presence of pesticides and herbicides on the site and the contents of unlabeled containers located on the site if these areas will be used for the Phase 4b Project. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-150-005: Conduct a Phase II ESA if stained soil is discovered during earthmoving activities to evaluate stained soil and the presence of pesticides and herbicides on the site. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-170-080: the project proponent(s) shall, as necessary, remove the existing septic system and discovered underground pipelines, in accordance with applicable Federal, state, and local laws and regulations.

APN 35-271-021: Conduct a Phase II ESA, if stained soil or strange odors are discovered during earthmoving activities, to evaluate stained soil and the presence of hazardous materials on the site. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-271-015: Conduct a Phase II ESA, if stained soil or strange odors are discovered during earthmoving activities, to evaluate stained soil and the presence of hazardous materials on the site. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities on each respective parcel within the Phase 4b Project footprint

Implementing this mitigation measure would reduce the potentially significant impact from potential human exposure of known hazardous materials at the project site under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-significant** level because known hazardous materials located within the Phase 4b Project footprint would be assessed in accordance with recommendations in the environmental site assessments; consultation with appropriate Federal, state, and local agencies would occur; and on-site contamination would be removed and properly disposed of by a licensed contractor in accordance with Federal, state, and local laws and regulations. ***(Similar)***

Mitigation Measure 4.16-c(2): Complete Phase I and/or II ESAs, Soil, and/or Groundwater Investigations in Phase 4b Project Footprint Areas Not Covered by the Existing Phase I and/or II ESAs, and Implement Required Measures (e.g., Site Management and/or Other Contingency Plans)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of construction and earthmoving activities, on parcels where project-related earthmoving activities would occur (including borrow activities), the project proponent(s) shall conduct Phase I ESAs (if not previously conducted), Phase II ESAs (if necessary), and/or other appropriate testing, including, as necessary, analysis of soil and/or groundwater samples for the potential contamination sites that have been previously investigated. Recommendations in the Phase I and II ESAs to address any identified contamination shall be implemented before initiating ground-disturbing activities, and may include the following:

- Prepare a site management plan that contains protocols and procedures for excavation, use, disposal, and handling of soil containing pesticide residues or contaminants, and for identifying possible contamination during construction. The plan shall include measures for the safe transport, use, and disposal of pesticide residue impacted soil and building debris removed from the site. Soil reuse may include: containing portions of the affected topsoil within the core of seepage berms, with an overlay of clean soil to prevent surface runoff caused by rainfall erosion on the topsoil materials; rip, mix, and/or amend affected topsoil that is respread onto borrow sites, levee, and/or berm surfaces, to provide a plant growth medium and reduce the concentration of pesticide residues in the soil; establish native perennial grasses and other perennial vegetation cover (e.g., hay, alfalfa) on these planted surfaces to reduce sediment runoff that may be caused by rainfall erosion or surface irrigation; and improve the drainage of agricultural lands used as borrow/mitigation sites to reduce ponded water and minimize the discharge of sediments into nearby drainages. In the event that contaminated groundwater is encountered during site excavation activities, the contractor shall report the chemical concentrations to the appropriate regulatory agencies, dewater the excavated area, and treat the groundwater to remove the chemicals before discharge. The contractor shall comply with applicable Federal, state, and local laws and regulations. The plan shall outline measures for specific handling and reporting procedures for hazardous materials and disposal of hazardous materials removed from the site at an appropriate off-site disposal facility. The plan shall include, but shall not be limited to: delineations of the horizontal and

vertical extent and concentration of soil contamination; a list of required monitoring equipment to be on-site during soil excavation (e.g., an air quality meter shall be used at the fenceline during dust-producing activities); sampling and analysis protocol for additional soil investigations; a list of necessary agencies to be contacted if chemical concentrations in water, air, and/or soil exceed set threshold limits; and a list of necessary permits, reports, or other compliance mechanisms.

- Retain an industrial hygienist to prepare a construction worker health and safety plan, which shall include, but not be limited to: personal protective equipment for construction workers, a delineation of the horizontal and vertical extent of elevated arsenic levels, a list of required monitoring equipment to be on-site during contaminated soil excavation (e.g., air quality meter), and proper procedures in the event that stained soil is encountered.

- Retain a qualified professional to conduct an ecological risk assessment on any sites found to contain levels of contaminant exceeding pertinent ecologieal risk levels. The ecological risk assessment shall include, but not be limited to: potential chemicals of concern, biological characterization of the site, identification of potential exposure pathways, ecological receptors, and recommendations for and implementation of remediation, where feasible and practicable.

- Retain an air quality specialist to monitor the concentration of particulates of concern in the air at the project fenceline, adjacent to residential property to ensure compliance with Federal, state, and local laws and regulations, to the extent feasible and practicable. Airborne particulate monitoring should be performed in the on-site worker's breathing zone using the Particulate Not Otherwise Specified (NOS) concentrations standard of 5 mg/m^3 as well as at the project boundaries using the Fenceline Particulate NOS goal of 0.3 mg/m^3.

- Retain a licensed contractor to remove underground storage tanks (USTs), aboveground storage tanks (ASTs), and stained soils in accordance with applicable Federal, state, and local laws and regulations.

- Retain a licensed contractor to remove and dispose of asbestos cement pipe found within the Phase 4b Project area in accordance with applicable Federal, state, and local laws and regulations.

- Retain a licensed contractor to remove septic systems, water wells, and other underground structures, as needed, in accordance with applicable Federal, state, and local laws and regulations.

- Retain an asbestos specialist who is certified by the Cal/OSHA to investigate whether asbestos-containing materials or lead-based paints are present before demolition of on-site buildings and utilities. If materials containing asbestos or lead are found, they shall be removed by an accredited contractor in accordance with EPA and Cal/OSHA standards. In addition, activities (construction or demolition) in the vicinity of these materials shall comply with Cal/OSHA asbestos and lead worker construction standards. The materials containing asbestos and lead shall be disposed of properly at an appropriate off-site disposal facility.

- Obtain an assessment conducted by SMUD and/or PG&E pertaining to the contents of the existing pole-mounted transformers that would be relocated as part of the Phase 4b Project. The assessment shall determine whether existing on-site electrical transformers

contain PCBs and whether there are records of spills from such equipment. If equipment containing PCBs is identified, the maintenance and/or disposal of the transformer shall be subject to the regulations of the Toxic Substances Control Act under the authority of the Sutter County Environmental Health Division and Sacramento County Environmental Management Department.

- Identify oil and gas well locations. Prepare and implement a California Department of Oil, Gas, and Geothermal Resources well review program, if necessary.
- Notify the appropriate Federal, state, and local agencies, as required, if evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous groundwater) is encountered during construction activities. Areas with chemical concentrations exceeding regulatory levels shall be cleaned up in accordance with recommendations made by the Sutter County Environmental Health Division, Sacramento County Environmental Management Department, Central Valley RWQCB, DTSC, or other appropriate Federal, state, or local regulatory agencies as generally described above.
- Implement Mitigation Measure 4.15-b, "Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage," as set forth in Section 4.15, "Utilities and Service Systems."

Responsibility:	Project proponent(s)
Timing:	Before the start of construction activities

Implementing this mitigation measure would reduce the potentially significant impact from possible human exposure to unknown hazardous materials at the project sites to a **less-than-significant** level under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because potentially hazardous materials would be identified; a site management plan that specifies remediation activities and procedures to appropriately identify, stockpile, handle, reuse and/or remove and dispose of hazardous materials would be prepared and implemented; monitoring activities would be implemented to ensure that construction workers and the general public are not exposed to unsafe levels of hazardous materials; and hazardous materials that are encountered would be removed and properly disposed of or otherwise remediated by licensed contractors in accordance with Federal, state, and local laws and regulations. ***(Similar)***

Impact 4.16-d: Interference with an Adopted Emergency Evacuation Plan

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to interfere with adopted emergency evacuation plans. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could damage roadways. Road closures could create increases in traffic levels that could interfere with the use of main roadways for emergency evacuation routes. Because the effects of a levee failure are unpredictable, a precise determination

of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would increase traffic on local roadways associated with construction trips. In addition, temporary road closures associated with levee improvements could cause or contribute to temporary increases in traffic levels as traffic is detoured or slowed on some local roadways and SR 99. During construction increased traffic congestion could interfere with the use of main roadways for emergency evacuation routes, including Airport Boulevard, Arena Boulevard, Del Paso Road, El Centro Road, Elkhorn Boulevard, Elverta Road, Garden Highway, Natomas Boulevard, Northgate Boulevard, Power Line Road, San Juan Road, Truxel Road, West El Camino Avenue, SR 99, I-5, and I-80. See Section 4.10, "Traffic and Circulation," for further discussion of traffic-related impacts. This temporary impact is considered **significant**. ***(Similar)***

Mitigation Measure 4.16-d: Implement Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," and Mitigation Measure 4.10-c, "Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers"

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	The project proponent(s) shall implement Mitigation Measures 4.10-a and 4.10-c, set forth in Section 4.10, "Traffic and Circulation," to avoid impairment of the Natomas Basin emergency evacuation routes.	
	Responsibility:	Project proponent(s)
	Timing:	Before the start of construction activities

Implementing this mitigation measure would reduce the temporary impact from the potential interference with an adopted emergency evacuation plan under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-significant** level because the appropriate state and local agencies would be involved in implementing detours to ensure acceptable traffic flow and reduce the risk of impairment to emergency evacuation routes. ***(Similar)***

Impact 4.16-e: Possible Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to release hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could damage the Natomas Basin in such a way that hazardous substances could be emitted or handled within one-quarter mile of an existing or proposed school. However, in the event of a catastrophic flood event, the affected areas would be

evacuated and students would not attend school in the immediate aftermath. Because no students would be affected by a potential hazardous substance emission, this impact is considered **less than significant**. ***(Lesser)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Seven schools are located within one-quarter mile of the Phase 4b Project footprint, as detailed in Section 3.16.2.4, "Schools within One-Quarter Mile of the Project Footprint." Construction and maintenance activities and borrow excavation would involve the use of potentially hazardous materials, such as fuels (gasoline and diesel), oils and lubricants, and cleaners (which could include solvents and corrosives in addition to soaps and detergents), that are commonly used in construction projects. Additionally, undocumented contaminated soil or water may be found during construction. Because the potential exists for exposure to both known and previously unknown hazardous materials within one-quarter mile of a school during construction activities, this temporary impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.16-e: Notify the Natomas Unified School District and Affected Schools within One-Quarter Mile of Project Construction Activities

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	The project proponent(s) shall provide written notification of the project to the Natomas Unified School District and each of the affected schools within 30 days prior to SAFCA's certification of the EIR and shall consult with Natomas Unified School District regarding the potential impacts on school children from hazards associated with Phase 4b Project implementation.

Responsibility:	Project proponent(s)
Timing:	Within 30 days of SAFCA certifying of this EIR

Implementation of this mitigation measure would reduce impacts associated with potential hazardous materials emissions related to schools within one-quarter mile of the project area to a **less-than-significant** level because under CEQA, the notification process is considered to satisfy the requirements of CEQA (California PRC Section 21151.4). ***(Similar)***

Impact 4.16-f: Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to increase the number of wildlife at the Airport. None of the proposed borrow site activities, dewatering, filling, canal replacement, removal and replacement of trees, or creation of habitat described for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would occur. No additional new wildlife strikes would occur. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding is likely to result in changes in land surface in some areas, and areas retaining water for long periods even after floodwaters have receded. These conditions could result in high numbers of birds being attracted to the lands around the Airport (which is in a low-elevation area in the Basin) in the months following flooding and the resumption of Airport operations, increasing the potential for collisions

between aircraft and wildlife. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Airport has one of the highest numbers of reported wildlife strikes with aircraft of all California airports (SCAS 2007). Collisions between aircraft and wildlife compromise the safety of aircraft passengers and flight crews. In an attempt to reduce wildlife collisions with aircraft, SCAS has maintained and implemented the WHMP for more than 10 years at the Airport. The plan identifies routine maintenance, hazardous wildlife habitat manipulation, and other land management activities as the most effective long-term preemptive measures for reducing wildlife hazards.

As described in FAA's AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, the FAA recommends a separation distance of 10,000 feet between the Airport Operations Area and hazardous wildlife attractants (FAA 2007); this area is identified as Airport Perimeter B. Additionally, the FAA recommends a distance of 5 statute miles between the farthest edge of the Airport Operations Area and hazardous wildlife attractants (FAA 2007). Open water and agricultural crops are recognized as being the greatest wildlife attractants in the Airport vicinity, and rice cultivation is considered the most incompatible agricultural crop because of its flooding regime. Wildlife attractants near the runways are of greatest concern because, nationally, 74% of bird-aircraft strikes occurred at or below 500 feet above ground level (Cleary, Dolbeer, and Wright 2004). The area within a 10,000-foot radius of the Airport Operations Area is where arriving and departing aircraft are typically operating at or below 2,000 feet, an altitude that also corresponds with most bird activity (SCAS 2007).

Generally, the Airport Perimeter B is currently used for agricultural purposes, a land use practice that is considered to attract hazardous wildlife. Realignment of the portion of the existing West Drainage Canal located immediately south of I-5, would move that portion of the canal farther from the Airport Operations Area; however, the realigned portion of the canal would remain in the Approach-Departure Zone and within Airport Perimeter B. Additionally, the relocated alignment would be approximately 0.25-mile longer than the existing alignment, which would increase open water within the Approach-Departure Zone and Airport Perimeter B. Also, the slope of the bank would be flattened to a 3:1 slope, and benches for planting tules would be created. The increase in open water along with the creation of benches for planting of tules would potentially create additional habitat for hazardous wildlife (e.g., black birds); however, the project proponent(s) would work with SCAS to design the relocated and improved West Drainage Canal to minimize new hazardous wildlife attractants by complying with applicable FAA guidance. For these reasons, this impact would be **less than significant**. ***(Similar)***

Mitigation Measure: No mitigation is required.

Impact 4.16-g: Aircraft Safety Hazards Resulting from Project Implementation

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4 Project construction activities would occur; therefore, no potential exists for the project to introduce a safety hazard within or near the Airport Perimeter B. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases

of NLIP must be implemented. Extensive night lighting may be necessary near or within the Airport Perimeter B for emergency operations, which could pose a potential safety hazard. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Nine airports/airstrips are located within 2 miles of the Phase 4b Project footprint, as described in Section 3.16.2.5, "Airport Safety." Safety hazards associated with airports are generally related to construction of tall structures and the creation of wildlife attractants (e.g., wetlands, golf courses, and waste disposal operations) that could interfere with airplane flight paths. No tall buildings or other structures would be constructed as part of the Phase 4b Project. In addition, there would be no new hazardous wildlife attractants associated with the Phase 4b Project (see Impact 4.16-g, "Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport," for more information).

In Sacramento River east levee Reaches C:4A–6A, the proposed Natomas Levee Class I Bike Trail would be constructed on Federally Obligated Land that was acquired with a combination of Sacramento County funds and FAA grant funds, and thus can only be used for Airport purposes (see Impact 4. 3-a, "Inconsistency with Airport Master Plan, Airport Land Use Compatibility Plan, and Airport Wildlife Hazard Management Plans"). In addition, although the Natomas Levee Class 1 Bike Trail Project is conceptual at this stage and no alignment has been selected, it is intended that the bike trail would generally follow the Natomas Basin perimeter levee system (**Plate 2-19**), putting it within one-half mile of the Airport Operations Area in Reaches C:5A–6A of the Sacramento River east levee (see **Plate 1-7**). Therefore, the proposed Natomas Levee Class I Bike Trail would intensify land use in an area where public safety is of critical concern to SCAS and the FAA. If Airport safety is not taken into consideration in the design of the Natomas Levee Class I Bike Trail Project, the potential exists for the bike trail to pose an aircraft safety hazard. Because the extent and severity of potential impacts cannot be evaluated at a detailed project-level, this long-term impact is considered **potentially significant**. ***(Similar)***

Mitigation Measure 4.16-g: Consult with SCAS and the FAA during Design of the Proposed Natomas Levee Class I Bike Trail to Implement Appropriate Airport Safety Precautions

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Sacramento County Department of Transportation (SacDOT), Sutter County, and the City of Sacramento to shall consult with SCAS and the FAA to ensure that applicable regulations and safety precautions are considered and built into construction of the proposed Natomas Levee Class I Bike Trail. These safety precautions shall include project elements that would reduce opportunities for hazards to the Airport and public, and may include features such as fencing, increased security personnel, and special consideration of alignment and parking areas near the Airport. The Natomas Levee Class I Bike Trail shall not be opened for use until these elements are completed.

Responsibility:	SacDOT, Sutter County, and the City of Sacramento
Timing:	Before the start of construction of the proposed Natomas Levee Class I Bike Trail

SacDOT is responsible for implementing this mitigation measure, which would reduce the potential for the Natomas Levee Class I Bike Trail Project to pose an aircraft safety hazard to a less-than-significant level. Site-specific impacts of the identified improvements will be assessed pursuant to CEQA requirements when the specific alignment has been selected and designed, separate from the NPACR/Phase 4b Project EIS/EIR. Any such necessary environmental review will be completed before implementation of the bike trail. The proposed Natomas Levee Class I Bike Trail falls under the jurisdiction of Sacramento (SacDOT) and Sutter Counties, and the City of Sacramento; therefore, neither USACE nor SAFCA, as the project proponent(s) would

have control over the timing or implementation of the mitigation measure. Thus, this impact would remain **significant and unavoidable**. (*Similar*)

Impact 4.16-h: Potential Exposure to Wildland Fires

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to expose people or structures to wildland fires. There would be **no impact**. *(Lesser)*

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A recently flooded area is not likely to be dry enough to sustain a fire that would pose significant risk of loss, injury, or death. However, if accumulated debris from uprooted vegetation or structures remained in place long enough to dry out, there would be a potential for increased fire hazard. However, the potential for such an occurrence is uncertain, and the magnitude of the effect cannot be predicted; therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration**. *(Currently Unknown)*

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Although no "Very High Fire Hazard Severity Zones" are located in the Phase 4b Project area, and the majority of Sutter and Sacramento Counties are located in either a "nonflammable" or "moderate" zone for wildland fires, the project components would be constructed in locations where physical and weather conditions may combine to lead to a high risk of fire hazard. Construction equipment or construction practices could accidentally ignite fires that may result in wildland fires and expose people or structures to a significant risk of loss, injury, or death under some circumstances. This potential temporary impact is considered **potentially significant**. *(Similar)*

Mitigation Measure 4.16-h: Prepare and Implement a Fire Management Plan to Minimize Potential for Wildland Fires

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall prepare and implement a fire management plan in coordination with the appropriate emergency service and/or fire-suppression agencies of the applicable local jurisdictions before the start of project construction. The plan shall describe fire prevention and response methods, including fire precaution, pre-suppression, and suppression measures that are consistent with the policies and standards of the affected jurisdictions. All materials and equipment required for implementation of the plan shall be maintained on-site. All construction personnel shall be made familiar with the contents of the plan before construction activities begin.

Responsibility:	Project proponent(s)
Timing:	Prepare fire management plan before the start of Phase 4b Project construction activities; conduct construction personnel training before the start of construction activities; and implement measures during construction

Implementing this mitigation measure would reduce the potential temporary impact from exposure to wildland fires under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-**

significant level, because a plan to provide project-specific fire prevention and response would be prepared and implemented. ***(Similar)***

4.16.3 RESIDUAL SIGNIFICANT IMPACTS

Impacts associated with spills of hazardous materials, exposure to hazardous materials or interference with emergency evacuation, increased hazards in the vicinity of the Airport or increased frequency of wildlife airstrikes, and increased wildfire hazards due to the No-Action Alternative are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Implementation of the mitigation measures described in this section for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would reduce all potential impacts associated with spills of hazardous materials, potential land use constraints due to contamination within the Pumping Plant No. 8 footprint and potential exposure of construction workers and the general public to contaminated groundwater, exposure to hazardous materials or interference with emergency evacuation, and increased wildfire hazards to less-than-significant levels.

The mitigation measure described in this section for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative for increased hazards associated with the Airport as a result of implementation of the Natomas Levee Class I Bike Trail is the responsibility of SacDOT, Sutter County, and the City of Sacramento. However, neither USACE nor SAFCA, as the project proponent(s) would have control over the timing or implementation of the mitigation measure. Thus, this impact would remain significant and unavoidable.

4.17 ENVIRONMENTAL JUSTICE

Environmental justice is defined by the U.S. Environmental Protection Agency (EPA) Office of Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that "no group of people, including racial, ethnic, or socioeconomic group, shall bear a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies." Analysis of project effects on environmental justice is required by NEPA.

4.17.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.17.1.1 METHODOLOGY

The following analysis is based on *Environmental Justice, Guidance Under the National Environmental Policy Act,* prepared by the Council of Environmental Quality (CEQ) and the Executive Office of the President (CEQ 1997). Although none of the published guidelines define the term "disproportionately high and adverse," CEQ includes a non-quantitative definition stating that an effect is disproportionate if it appreciably exceeds the risk or benefit rate to the general population.

Under the CEQ guidelines, the first step in conducting an environmental justice analysis is to determine the presence of minority and low-income populations (CEQ 1997:25). The second step of an environmental justice analysis requires that the Federal agency determine if the Federal action would result in disproportionately high or adverse health or environmental effects (CEQ 1997:26). The CEQ guidance indicates that when determining whether the effects are high and adverse, agencies are to consider whether the risks or rates of impact "are significant (as employed by NEPA) or above generally accepted norms" (CEQ 1997:26). The CEQ offers a non-quantitative definition stating that an effect is disproportionate if it appreciably exceeds the risk or rate to the general population (CEQ 1997:26). The environmental justice analysis is based on a review of relevant demographic data to define the relative proportion of minority and low-income populations in the Natomas Basin to determine whether the Phase 4b Project would result in environmental justice affects on the relevant populations. (See Section 3.17, "Environmental Justice," and **Appendix H** for the demographic data used to conduct this analysis.)

This section compiles demographic data on income and minority status for census block groups that occur in the Natomas Basin, and then compares these data with the demographic profiles of Sutter and Sacramento Counties to determine if the Natomas Basin contains significant minority or low-income populations. **Table 3.17-1** presents the relative proportion of the population that responded as members of minorities or as low-income households during the 2000 Census. These data are based upon **Appendix H**, which compiles and explains the source of these data (U.S. Census Bureau 2006).

The Natomas Basin does not contain a significant low-income population, as indicated in **Table 3.17-1** (e.g., the low-income population in the Natomas Basin is greater than 50% of the total population in the Natomas Basin, or the low-income population in the Natomas Basin is substantially greater than in Sacramento or Sutter Counties. The Sutter County portion of the Natomas Basin has a minority population that is less than 50% of the total (23.34%), and is also lower than the proportion of minorities in Sacramento and Sutter Counties (42.24% and 39.78%, respectively). The Sacramento County portion of the Natomas Basin, however, does contain a significant minority population (60.35% of the total population for those census block groups).

4.17.1.2 THRESHOLDS OF SIGNIFICANCE

To prove a violation of Federal environmental justice principles, low-income populations, individuals belonging to minority populations, and/or minority populations (i.e., Native American or Alaskan Native, Asian or Pacific

Islander, African American, black, not of Hispanic origin, or Hispanic) must be affected by the project. According to CEQ, two types of environmental justice impacts may exist: disproportionately high and adverse human health effects and disproportionately high and adverse environmental effects. Determination of disproportionately high and adverse human health effects considers whether any of the following criteria would exist:

- The health effects, which may be measured in risks and rates, are significant (as defined by NEPA), or above the generally accepted norm. Adverse health effects may include bodily impairment, infirmity, illness, or death.
- The risk or rate of hazard exposure by a minority population, low-income population, or Native American tribe to an environmental hazard is significant (as defined by NEPA) and appreciably exceed the risk or rate to the general population or other appropriate comparison group.
- The health effects occur in a minority population, low-income population, or Native American tribe affected by cumulative or multiple adverse exposures from environmental hazards.

Determination of a disproportionately high and adverse environmental effect considers whether any of the following criteria would exist:

- There is or would be an impact on the natural or physical environment that significantly (as defined by NEPA) and adversely affects a minority population, low-income population, or Native American tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Native American tribes when those impacts are interrelated to impacts on the natural or physical environment.
- The environmental effects are significant (as defined by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Native American tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.
- The environmental effects occur or would occur in a minority population, low-income population, or Native American tribe affected by cumulative or multiple adverse exposures from environmental hazards.

4.17.2 Impacts and Mitigation Measures

Impact 4.17-a: Potential to Have a Disproportionate High and Adverse Environmental Impact on any Minority or Low-Income Populations

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project improvements would be made to the Natomas perimeter levee system and there would be no potential to have disproportionately high and adverse environmental impacts on any minority or low-income populations. There would be **no impact**. ***(Lesser)***

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all NLIP phases must be implemented. If the primary location of flooding occurred in the Sacramento County portion of the Basin, flooding could cause disproportionately impact to minority or low-income populations by causing displacement of people from their homes, disruption of business, damage to property, and injury or death. However, it is equally probable that a levee breach would occur in the northern half of the Basin (in Sutter

County), which has relatively low population density and a low minority population in relation to the total population (23.34%). Determination of the location, and thus the impact of a levee breach, is speculative. Therefore, a precise determination of significance is not possible and cannot be made because the location and extent of the magnitude of the potential impact is unknown. Because of this uncertainty, this potential impact is considered to be **too speculative for meaningful consideration**. ***(Currently Unknown)***

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would reduce the risk of flooding to existing residential, commercial, and industrial development in the Natomas Basin. While there are low-income and minority populations present in a portion of the Phase 4b Project area, as discussed in Section 3.17, "Environmental Justice," the flood damage reduction benefits of the project would accrue to all segments of the population in the Natomas Basin. Any potential environmental effects on low-income and minority neighborhoods would be the same types of impacts experienced throughout the project area (e.g., primarily temporary exposure to construction noise, dust, erosion, and light and glare during construction), and no permanent residential relocations would disproportionately affect low-income areas or areas with high minority populations. Therefore, the project would not have a disproportionately high and adverse environmental impact on any minority or low-income populations.

Executive Order 12898, which is described more fully in Chapter 6, "Compliance with Federal Environmental Laws and Regulations," requires that the lead Federal agency consider the effects of an action on Native American tribes and determine if the adverse effects are disproportionate to the beneficial aspects of the action. As described in Section 4.10, "Cultural Resources," many elements of the project have the potential to adversely affect cultural resources that possess particular cultural significance and value to Native American individuals and organizations that are culturally affiliated with the prehistoric inhabitants of the Natomas Basin. Construction of improvements such as seepage berms and cutoff walls, as well as the excavation of large quantities of borrow from a range of possible sites, has the potential to damage prehistoric archaeological assemblages, including interred skeletal remains (see Section 2.3.3 for a discussion of potential borrow sites.) The ancestors of the Native American tribes that dwelled on the project site in the past may not necessarily experience the direct beneficial aspect of flood damage reduction in the Natomas Basin. This raises an environmental justice concern because the project could disturb and/or damage cultural resources of importance to the Native American community, while the Native American community would not receive a proportionate benefit from flood damage reduction because they live in dispersed locations, largely outside of the Natomas Basin. This is a **significant** impact with respect to environmental justice. ***(Similar)***

Mitigation Measure 4.17-a: Increase the Direct Benefits of the Project for the Ancestors of the Native American Tribes

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As part of the Phase 4b Project, the project proponent(s) proposes to acquire various properties in the Natomas Basin as compensation for the project's potential impacts, as required under Federal and state laws. As part of the process for restoring these lands, the project proponent(s) shall implement the following measures to address environmental justice and increase the direct benefits to the ancestors of the Native American tribes that would bear disproportionate adverse effects:

- consult with appropriate Native American representatives to identify plant species of value for traditional cultural uses;
- consult with Native American representatives to identify traditional cultural activities that could occur on these lands, consistent with habitat conservation and safety objectives;
- to the extent feasible, include identified plant species in the planting palettes developed for habitat conservation;

- to the extent feasible, establish easements or other protective measures on these properties that include access for appropriate Native American representatives for plant gathering and other traditional cultural activities; and
- where feasible, also provide access to appropriate Native American representatives to the river front on acquired parcels that have access to the Sacramento River, provided that access does not permit the construction of physical structures on the levee, beaches, or in the river without prior approval from the appropriate regulatory agency.

Responsibility: Project proponent(s)

Timing: During project design and construction

Implementing this mitigation measure would reduce the impact to a **less-than-significant** level because it would provide the ancestors of the Native American tribes with a benefit that would offset the disproportionate burden created by impacts to cultural resources of concern, and of great value to the Native American community, caused by the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. ***(Similar)***

4.17.3 RESIDUAL SIGNIFICANT IMPACTS

In the event of a levee failure under the No-Action Alternative, impacts to minority or low-income populations or Native American tribes are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

With implementation of the mitigation measure described in this section, project implementation would not result in any residual significant impacts related to environmental justice.

4.18 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FROM PREVIOUS NATOMAS LEVEE IMPROVEMENT PROGRAM PHASE 1–4a LANDSIDE IMPROVEMENTS PROJECTS

4.18.1 INTRODUCTION

Because this EIS/EIR will support the approval of USACE's Common Features GRR and Common Features/ Natomas PACR, it must summarize impacts and mitigation measures from all previous NLIP phases.

4.18.2 SUMMARY OF PHASE 1–4a PROJECTS

Table 4.18-1 presents the NLIP Landside Improvements Projeet's major components and construction timing of each project phase. Years are shown in the table below to identify the anticipated starting point of each projeet phase; however, only some components of each project phase would begin in the first year of construction (e.g., while some portions of the Phase 3 Project began in 2009, proposed levee work would not begin until 2010). Further, the project phases, while originally envisioned to be constructed in the order they are numbered, could be constructed out of order (e.g., the Phase 4a Project, or components thereof, could be constructed before the Phase 3 Project) depending on project design and other factors. Project phasing and construction sequencing of project components are not necessarily dependent upon one another, but are dependent more on the availability and timing of funding. Because each project is analyzed in the cumulative context of the entire NLIP Landside Improvements Project, there will be no undisclosed impacts if the order of construction is altered.

Table 4.18-1
Major Components and Construction Timing of the Landside Improvements Project Phases

Project Phase and Construction Timing	Project Component
Phase 1 Project 2007–2008 Construction Complete	Natomas Cross Canal (NCC) south levee improvements (westernmost 12,500 feet): Through-seepage and underseepage remediation
Phase 2 Project 2009–2010	NCC south levee improvements: Levee raising and seepage remediation Sacramento River east levee Reach C:1–4B: Levee raising and seepage remediation Relocation of the Upper Elkhorn Canal (North Drainage Canal to Elkhorn Reservoir) Construction of the Upper GGS/Drainage Canal (North Drainage Canal to just south of Elkhorn Reservoir) Removal of a deep culvert at Reclamation District (RD) 1000 Pumping Plant No. 2 Borrow and reclamation at: Airport north bufferlands, Brookfield, Dunmore, RD 1001, and Sutter Pointe Habitat creation and management Right-of-way acquisition Encroachment management Infrastructure relocation and realignment Reconstruction of Garden Highway intersections
Phase 3 Project 2009–2010	Sacramento River east levee (Reach B:5A–9B): Levee raising and seepage remediation Pleasant Grove Creek Canal (PGCC) west levee: Levee raising, slope flattening, and widening; and seepage remediation Natomas East Main Drainage Canal (NEMDC) west levee (Elkhorn Boulevard to NEMDC Stormwater Pumping Station): Levee widening and flattening and seepage remediation NEMDC west levee (NEMDC Stormwater Pumping Station to Northgate Boulevard): Seepage remediation and slope stability remediation Relocation of approximately 9,400 feet of the Elkhorn Canal (highline irrigation canal) downstream of Elkhorn Reservoir Construction of a new GGS/Drainage Canal downstream of Elkhorn Reservoir Reconstruction of RD 1000 Pumping Plant No. 2 Habitat creation and management Infrastructure relocation and realignment

Table 4.18-1
Major Components and Construction Timing of the Landside Improvements Project Phases

Project Phase and Construction Timing	Project Component
	Landside vegetation removal (Sacramento River east levee Reach B:10–12A) Right-of-way acquisition Encroachment management Borrow and reclamation at Airport north bufferlands; Brookfield; Dunmore; Elkhorn Borrow Area; Lower Woodland Corridor; Krumenacher; Novak; Pacific Terrace; private property (in Reaches B:5A, B:6B, and B:7); RD 1001; South Sutter, LLC; Sutter Pointe; and Twin Rivers Unified School District Reconfiguration of Airport West Ditch to allow for dewatering Reconstruction of Garden Highway intersections
Phase 4a Project 2011–2012	Sacramento River east levee (Reach B:10–15): Levee raising and seepage remediation Sacramento River east levee Reach C:4B: Seepage remediation NCC south levee: Levee raising and seepage remediation at two locations Replacement of South Lauppe Pump Riverside Canal (highline irrigation canal) relocation and extension Modifications to Natomas Central Mutual Water Company's Riverside Pumping Plant and RD 1000's Pumping Plants Nos. 3 and 5 Development of new and replacement groundwater wells Borrow site excavation and reclamation at Fisherman's Lake Borrow Area (including Novak); I-5 Borrow Area; Elkhorn Borrow Area; South Sutter, LLC; Krumenacher; Twin Rivers Unified School District stockpile; and Airport north bufferlands Habitat creation and management Infrastructure relocation and realignment Landside and waterside vegetation removal Landside vegetation removal in Sacramento River east levee Reach B:12A–15 Right-of-way acquisition Encroachment management Exchange of properties between SAFCA and the Sacramento County Airport System in Reaches C:4A, B:5B, and B:6 of the Sacramento River east levee Reconstruction of Garden Highway intersections
Phase 4b Project 2012–2016	Sacramento River east levee (Reach A:16–20): Levee widening/rehabilitation and seepage remediation Sacramento River east levee (Reach B:10–15): Levee raise extension American River north levee (Reach I:1–4): Slope flattening and seepage remediation NEMDC North (Reaches F–G): Levee raising, slope flattening, and seepage remediation PGCC (Reach E) and NEMDC South (Reach H): Levee raising and slope flattening PGCC (Reach E) and NEMDC South (Reach H): Waterside improvements PGCC (Reach E) culvert remediation State Route (SR) 99 NCC Bridge remediation (Reach D:6) West Drainage Canal Riego Road Canal (highline irrigation canal) relocation NCC south levee ditch relocations Modifications to the RD 1000 Pumping Plants Modifications to City of Sacramento Sump Pumps Borrow site excavation and reclamation at South Fisherman's Lake Borrow Area, Westside Lake School Site, and Triangle Properties Borrow Area Habitat creation and management Infrastructure relocation and realignment Landside vegetation removal Waterside vegetation removal Bank protection Right-of-way acquisition Encroachment management Natomas Levee Class 1 Bike Trail Project

Notes: Airport = Sacramento International Airport; GGS = Giant Garter Snake; I-5 = Interstate 5; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District
Source: Data compiled by AECOM in 2009, based on information provided by SAFCA

4.18.3 SUMMARY OF PHASE 1–4a PROJECTS' IMPACTS

The Phase 1 Project's environmental impacts and mitigation are addressed in detail in the Local Funding EIR; the Phase 2 Project's environmental impacts and mitigation are addressed in detail in the Phase 2 EIR, Phase 2 SEIR, and Phase 2 EIS; the Phase 3 Project's environmental impacts and mitigation are addressed in detail in the Phase 3 EIS and EIR; and the Phase 4a Project's environmental impacts and mitigation are addressed in detail in the Phase 4a EIS and EIR. Addenda to the Phase 2 and 3 EIRs address minor modifications to these project phases. **Table 4.18-2** summarizes the environmental impacts associated with the Phase 1–4a Projects' impacts which are addressed in the following documents:

- Local Funding EIR (SAFCA 2007a),
- Phase 2 EIR (SAFCA 2007b),
- Phase 2 EIS (USACE 2008),
- Phase 2 Supplemental EIR (SAFCA 2009a),
- Phase 2 EIR 1st Addendum (SAFCA 2009c),
- Phase 2 EIR 2nd Addendum (SAFCA 2009d),
- Phase 3 EIS and EIR (USACE 2009 and SAFCA 2009b),
- Phase 3 EIR Addendum (SAFCA 2009e), and
- Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f).

Table 4.18-3 summarizes the quantifiable environmental impacts associated with the Phase 1–4a Projects (Proposed Actions), as presented in the previous environmental documents identified above.

Impacts are based on the project description of each respective project phase at the time each of the environmental documents was written. When assumptions were necessary regarding potential overlapping of phases, the assumptions with the greatest impacts were made to present a worst-case analysis of impacts for the environmental analysis; actual impacts would be somewhat less than presented in **Table 4.18-3** because of the worst-case assumptions used to derive the quantitative impacts.

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
Agricultural Resources	**Phase 1 Project**
	Construction of the cutoff wall would occur along the existing levee centerline and would not alter the levee footprint or result in changes to the floodway. Therefore, there would be no permanent conversion of Important Farmland to nonagricultural uses and no agricultural land would be permanently removed from production. During the construction period, approximately 1 acre along the landside levee toe between the levee and canal would be used for construction staging, including storage for construction equipment and other vehicles. Cutoff wall construction would require the temporary establishment of an on-site batch plant that would occupy about 1 to 2 acres. To the extent feasible, the construction staging area and the temporary batch plant would be sited on land that is not cultivated, between the levee toe and actively farmed fields. Where construction activity would encroach on an agricultural field, the encroachment would be temporary and the land would be farmable following the end of construction activity. The potential haul routes are located on previously disturbed land and established roadways and access roads. Therefore, impacts to Important Farmland would be less than significant.
	Phase 2 Project
	Important Farmland would be converted for maintenance activities and encroachment prevention associated with widening the landside footprint of the NCC south levee and associated maintenance access corridor, which would substantially widen the footprint of the Sacramento River east levee's flood damage reduction facilities. Soil borrow sites for the improvements include the Brookfield site and the RD 1001 site. Borrow material for the Sacramento River east levee improvements would come from the Airport north bufferlands sites, the Dunmore site, or potentially the Sutter Pointe site. These borrow sites are in areas classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Except at the RD 1001 site, removing borrow from borrow sites would entail preserving and replacing the topsoil on these parcels, thus retaining their potential use for agriculture. The permanent conversion of Important Farmland would be a significant impact. No feasible mitigation measures are available to compensate for the permanent loss of farmland; therefore, with the implementation of mitigation measures the impact would remain significant and unavoidable.
	Phase 3 Project
	Important Farmland would be permanently converted to nonagricultural use for widening of Sacramento River east levee Reach B:5A–9B, the PGCC levee improvements, and creation of marsh, grassland, and woodland habitat to compensate for habitat removed. Permanent conversion of Important Farmland would take place on the Lower Woodland and RD 1001 borrow sites. All other borrow sites would be reclaimed and returned to agricultural uses. Williamson Act contracts would be terminated on land acquired in Reach B:9B and on the Elkhorn Canal alignment. The permanent conversion of Important Farmland and cancellation of Williamson Act contracts is considered a significant impact. No feasible mitigation measures are available to compensate for the permanent loss of farmland; therefore, with the implementation of mitigation measures the impact would remain significant and unavoidable.
	Phase 4a Project
	Important Farmland would be permanently converted to nonagricultural use for widening of Sacramento River east levee Reach B:10–15, realignment and extension of the Riverside Canal, and creation of managed marsh in the Fisherman's Lake Borrow Area. All other borrow sites would be reclaimed and returned to agricultural uses. The permanent conversion of Important Farmland would be a significant impact. No feasible mitigation measures are available to compensate for the permanent loss of farmland; therefore, with the implementation of mitigation measures the impact would remain significant and unavoidable.

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
Land Use, Socioeconomics, and Population and Housing	**Phase 1 Project**
	The Phase 1 Project would not develop infrastructure that would physically separate an identified community or residential cluster, would not conflict with land use planning and policies, would not alter the levee footprint or result in changes to the floodway, and there would be no change in permitted uses under the existing general plan land use and zoning designations for the project area. No agricultural land would be removed from production, and current agricultural uses could continue once construction is completed. Project activities at the RD 1001 borrow site may involve taking agricultural land out of production; however, use of the RD 1001 borrow site has been addressed by Sutter County in the *Reclamation Plan for Surface Mining Operation in Nicolaus, Sutter County* (Sutter County 1990). Because the project would not permanently result in the additional conversion of Important Farmland to nonagricultural uses, this impact would be less than significant.
	Phase 2, 3, and 4a Projects
	The Phase 2, 3, and 4a Projects would be consistent with Policy B.10 of the City of Sacramento General Plan because they would reduce flood risk in accordance with Resource Protection Policy B.10, which states: "The City shall seek to minimize or avoid adverse impacts to historic and cultural resources from natural disasters. To this end, the City shall promote seismic safety, flood protection, and other building programs that preserve, enhance, and protect these resources." Portions of the Phase 3 and 4a Projects' levee improvement footprints would overlap parts of the Airport Critical Zone (Perimeter B). The flood damage reduction improvements would not modify intended land uses within those areas, nor would they include components such as the creation of water features that could attract waterfowl, thereby introducing hazards into the Airport Critical Zone (Perimeter B). The improvements also would not conflict with implementation of the adopted Airport master plan, Airport land use compatibility plan, or Airport wildlife hazard management plans.
Geology, Soils, and Mineral Resources	**Phase 1, 2, 3, and 4a Projects**
	Borrow activities and levee improvement construction activities would temporarily disturb soil and could expose disturbed areas to erosion caused by wind or by winter or early-season rainfall events. Wind or rainfall of sufficient intensity could dislodge soil particles from the soil surface. Once particles are dislodged, substantial localized erosion could occur and grading and earthmoving activities would expose soils to wind erosion. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level.
	The Phase 1, 2, and 3 Projects would have no impacts related to mineral resources because no mineral resources are known to exist in these project areas. The Phase 4a Project would result in a potential loss of mineral resources due to project excavation of soil from the eastern edge of the Fisherman's Lake Borrow Area, which is zoned MRZ-3 by the California Department of Conservation's Division of Mines and Geology, indicating that the significance of mineral deposits in that area cannot be evaluated from existing data. Even with the implementation of mitigation measures, this impact would remain significant and unavoidable because mitigation cannot prevent the possible removal or disturbance of economically valuable mineral resources (if found).

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
Hydrology and Hydraulics	**Phase 1 Project**
	The Phase 1 Project would entail constructing a cutoff wall in a portion of the NCC south levee. Neither the height nor prism of the levee would be altered. Therefore, the Phase 1 Project would have no effect on hydrology or hydraulics.
	Phase 2, 3, and 4a Projects
	Implementation of the Phase 2, 3, and 4a Projects would not measurably alter water surface elevations in the project area except in the most extreme circumstances (i.e., a 200-year [0.005 AEP] or 500-year [0.002 AEP] flood with no upstream levee failures despite 100 miles of levee overtopping in areas upstream of the Natomas Basin). The Phase 2, 3, and 4a Projects would not change the existing geometry of the channels surrounding the Natomas Basin; therefore, they would not cause substantial changes to water flow in these channels, or cause adverse hydraulic effects upstream or downstream of the project area during peak flows. The borrow sites would be 3–5 feet lower after the conclusion of borrow operations. These sites would be regraded and either developed as grassland or returned to agricultural cultivation. Project engineers would coordinate with owners and operators of local drainage systems to evaluate pre-project and postproject drainage needs to remediate any substantial project-related drainage disruption. Drainage from these sites would be routed to the existing drainage system for these lands. Because the project would temporarily or permanently alter the existing drainage pattern of the project area, localized flooding could occur, resulting in a potentially significant impact. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level. The presence of cutoff walls could restrict the movement of groundwater in either direction (away from or toward the NCC or Sacramento River). Potential consequences are increases or decreases in the water levels in shallower wells and/or localized near-surface groundwater levels in areas immediately east and west of the cutoff wall. The evaluation of potential groundwater impacts prepared by Luhdorff & Scalmanini Consulting Engineers concluded that there would be no substantial decrease in groundwater levels or well yields would be expected as a result of the cutoff wall construction. These impacts are considered less than significant.
Water Quality	**Phase 1, 2, 3, and 4a Projects**
	Levee improvement activities have the potential to result in both short- and long-term water quality effects from runoff and sedimentation. Potentially affected waterways include the Sacramento River, NCC, Morrison Canal near the NCC south levee, PGCC, NEMDC, North Drainage Canal, West Drainage Canal, Riverside Canal, and Elkhorn Canal. Extensive ground-disturbing activities near these local drainages and waterways could potentially cause the waterways to become contaminated by soil or construction substances. Excavated areas that fill with groundwater or surface drainage during project construction would require dewatering. Effluent from dewatering operations typically contains high levels of suspended sediment and often high levels of petroleum products and other construction-related contaminants. Impacts on water quality are considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level.
Biological Resources: Fish and Aquatic Habitat	**Phase 1, 2, 3, and 4a Projects**
	Project construction activities could adversely affect migratory habitat for listed adult and juvenile Chinook salmon and steelhead that would be susceptible to water quality–related effects. Removal of riparian vegetation or woody material along the existing levee or otherwise in the floodplain could result in the loss of important shaded riverine aquatic habitat function. Modifications to pumping plants would require removing a small number of trees and trimming the canopies of other trees growing on the eroding bank. It is anticipated that any temporary construction losses

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
	of overhead shaded riverine aquatic habitat cover would be fully replaced by on-site mitigation planting. Although no permanent impacts would occur, this impact would not reach less-than-significant levels for 10–15 years, while replacement plantings reach maturity.
Biological Resources: Sensitive Aquatic Habitats	**Phase 1 Project**
	The seasonal wetland between the levee and TNBC reserve could be affected by movement of construction equipment and staging activities to support improvements along the adjacent levee reach. Levee improvements are also anticipated to require removal of a limited amount of trees near the top of the waterside of the levee to accommodate removal of the top of the levee for slurry wall construction and additional excavation and reconstruction of approximately 600 feet above the ordinary high water mark within NCC Reach D.2 to repair slip failures of the waterside slope of the levee. Because these resources have a very limited local distribution, such effects could have a substantial adverse effect on a local scale. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.
	Phase 2 Project
	Up to 70 acres of jurisdictional wetlands could be temporarily affected by the Phase 2 Project's borrow activities (including activities at the Brookfield borrow site in Sutter County). Up to 81 acres of jurisdictional wetlands and waters could be permanently affected. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level
	Phase 3 Project
	The Phase 3 Project would result in temporary impacts to approximately 1 acre of jurisdictional wetlands and permanent impacts to approximately 19 acres of jurisdictional wetlands. These impacts would result from construction along the Sacramento River east levee, PGCC west levee, NEMDC west levee, new Elkhorn Canal and GGS/Drainage Canal, and construction activities at the borrow sites and along haul roads. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level
	Phase 4a Project
	One acre of temporary loss of jurisdictional wetlands and waters of the United States would occur. A permanent loss of 7–10 acres of jurisdictional wetlands and waters of the United States would occur as a result of fill of agricultural ditches and borrow activities. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.
Biological Resources: Vegetation and Wildlife	**Phase 1 Project**
	The NCC and ditches and canals adjacent to the Phase 1 Project site serve as a corridor for wildlife movement within the Natomas area and to and from adjacent areas of habitat. The Phase 1 Project would result in disturbance of areas adjacent to ditches and canals and the southern side of the NCC. This disturbance is unlikely to affect use of the ditches and canals and would have relatively minimal affect on use of the NCC, because wildlife would be able to move through less disturbed potions of the corridor. Therefore, project construction is not anticipated to substantially interfere with use of wildlife corridors adjacent to the project site. This impact is considered less than significant.
	Phase 2 Project
	Levee improvements would require SAFCA to acquire additional land for maintenance activities and to prevent encroachment along the flood damage reduction facilities. Beneficial effects would include creation of approximately 30 acres of woodland habitat that would likely be planted along landside corridors, and acquisition by SAFCA of approximately 16 acres of existing woodland for preservation in public ownership.

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
	However, new woodland plantings would not mature for several years, and its near-term value as cover would therefore be limited when compared with the value of the existing landside woodland corridor along the Sacramento River east levee. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.
	Phase 3 Project
	The Phase 3 Project would remove as much as 34 acres of landside woodland habitat and less than 2 acres of waterside woodland habitat in Reach B.5A–9B of the Sacramento River east levee. Loss of woodland habitat would be offset by creating or preserving approximately 21 acres of woodland habitat along corridors on the landside of the adjacent levee along the Sacramento River in the Phase 3 Project footprint. These compensatory measures would complement woodland preservation and creation activities carried out as part of the Phase 2 Project. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level in the long term, however the impact would be significant and unavoidable in the near term (10–15 years).
	Phase 4a Project
	The Phase 4a Project would remove as much as 34 acres of landside woodland habitat in Reach B.10–15 of the Sacramento River east levee. Loss of woodland habitat would be offset by creating or preserving up to 58 acres of woodland habitat along corridors on the landside of the adjacent levee along the Sacramento River in the Phase 4a Project footprint. These compensatory measures would complement woodland preservation and creation activities carried out as part of the Phase 2 and 3 Projects. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level in the long term, however the impact would be significant and unavoidable in the near term (10–15 years).
Biological Resources: Special-Status Terrestrial Species	**Phase 1 Project**
	Four special-status plant species have potential to occur adjacent to the Phase 1 Project site in freshwater marsh habitat within the NCC, TNBC reserves, and ditches and canals. However, these aquatic habitats would not be affected by project construction. Aquatic habitats on and adjacent to the Phase 1 Project site that function as potential feeding, breeding, and rearing habitat for northwestern pond turtles would not be affected. Upland habitat in which project activity would occur is not suitable for nesting pond turtles. Therefore potential impacts to turtle habitat would be minimal, and direct effects to individual turtles are unlikely to occur. Ditches and canals, rice fields, and managed marsh adjacent to the Phase 1 Project site provide important aquatic habitat for giant garter snakes. Suitable upland adjacent to these aquatic habitats is very limited, and, in some areas, is almost exclusively provided by levee slopes and maintenance corridors. Project implementation would not affect any portion of the TNBC reserves or ditches and canals adjacent to the project site. Therefore, there would be no disturbance or loss of aquatic habitat. Construction activity would, however, occur in uplands within 200 feet of these aquatic habitats, resulting in temporary disturbance of potential basking and overwintering habitat for the snake. Construction activities could also result in direct disturbance and loss of individual giant garter snakes. This impact is considered significant. Suitable Swainson's hawk foraging habitat provided by ruderal vegetation along the levee slope and adjacent landside corridor would be disturbed during project construction. However, these effects would be temporary in nature and restricted to a relatively small area. A small number of trees that could provide suitable nest sites may require removal. These effects to foraging habitat and potential nest trees are unlikely to have a substantial adverse effect on Swainson's hawks. Construction activities could, however, result in disturbance of nesting Swainson's hawks, potentially

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
	resulting in nest abandonment and loss of active nests. This impact is considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.
	Phase 2, 3, and 4a Projects
	Levee improvement activities could adversely affect habitat for special-status species (rose mallow, special-status birds, Delta tule pea, and Sanford's arrowhead), elderberry, giant garter snake, and the Northwestern pond turtle. These impacts are considered significant. The Phase 2, 3, and 4a Projects would support attainment of the NBHCP's goals and objectives by creating and preserving habitat and creating a valuable aquatic corridor linking TNBC reserves in the northern and southern portions of the Natomas Basin. However, the potential for these project phases to threaten the viability of populations of certain covered species, reduce the effectiveness of the NBHCP's conservation strategy, and adversely affect attainment of the goals and objectives of the NBHCP could jeopardize successful implementation of the NBHCP. This impact is considered significant. The Phase 2, 3, and 4a Projects would not result in the development of land outside the NBHCP permit area, but would result in land use conversions. Land use conversion, however, would not cause a net loss in the habitat values provided by these lands for NBHCP-covered species in the Natomas Basin. Habitat creation and preservation associated with these projects would result in an increase in overall habitat quality, which is anticipated to compensate for the loss associated with land conversions. However, if habitat creation and preservation are not effectively implemented to provide woodland habitat for Swainson's hawk or other special-status species, an overall adverse effect could occur. These impacts are considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.
Cultural Resources	**Phase 1, 2, 3, and 4a Projects**
	Modification of the NCC levee, which is a contributing element of the RD 1000 Rural Historic Landscape District and is a documented historic resource, could alter the integrity of the resource. Modern agricultural cultivation of the Sacramento Valley floodplains and riverbanks has destroyed many prehistoric occupation sites, and the remains of these sites are thus no longer easily visible above ground. During project construction activities, previously undiscovered cultural resources, including Native American traditional cultural properties, may be discovered and disturbed. SAFCA is required under the programmatic agreement to complete an inventory of cultural resources before each project phase. Identified resources will be evaluated for NRHP eligibility, and SAFCA will make a finding of effect, in consultation with USACE and the SHPO. If adverse effects on historic properties are identified, SAFCA must prepare a historic properties treatment plan. This plan specifies actions that SAFCA will take to resolve adverse effects on a historic property or a set of historic properties. The programmatic agreement also requires SAFCA to prepare and submit a plan before construction for responding to inadvertent discoveries.
Paleontological Resources	**Phase 1, 2, 3, and 4a Projects**
	The potential exists for unique paleontological resources to be encountered in excavation at depths of 10 feet or more. Deep excavation, associated mainly with cutoff wall construction and borrow activity in construction of the Phase 1, 2, 3, and 4a Projects, could destroy unique paleontological resources. Because of this potential, this impact is considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.

Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Table 4.18-2

Issue Area	Summary of Environmental Impact
Transportation and Circulation	**Phase 1, 2, 3, and 4a Projects**
	The Phase 1, 2, 3, and 4a Projects would temporarily increase traffic on local roadways, potentially causing congestion on local roads during peak hours. Temporary road closures would contribute to congestion on local roads. Increased traffic, including use of roadways by heavy trucks, along with road closures would cause a temporary increase in hazards on local roadways. Increased congestion and road closures would also have a temporary effect on emergency service response times. These impacts are considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.
Air Quality	**Phase 1, 2, 3, and 4a Projects**
	Construction of the Phase 1, 2, 3, and 4a Projects would result in temporary and short-term generation of ROG, NO_X, and PM_{10} emissions from excavation, vegetation clearing, grading, borrow material hauling, and other construction activities. Control measures would be implemented to reduce these emissions below the Federal *de minimis* thresholds (however, a conformity determination is being prepared for the Phase 4a Project). None of the project phases would cause long-term changes in these emissions or expose sensitive receptors to toxic air contaminants. Because maximum construction emissions of ROG, NO_X, and PM_{10} would exceed local air management districts' thresholds and would contribute to existing nonattainment conditions in the Sacramento Valley Air Basin, this impact is considered significant. With the implementation of mitigation measures these impacts would remain significant and unavoidable.
Noise	**Phase 1, 2, 3, and 4a Projects**
	Construction of the Phase 1, 2, 3, and 4a Projects would result in generation of temporary and short-term construction noise along the Sacramento River east levee, NCC south levee, PGCC west levee, and NEMDC west levee. Noise control measures would be implemented, but operation of earth-moving equipment in the vicinity of noise-sensitive land uses, primarily residences, would exceed local exterior and interior noise standards. Cutoff wall construction and well drilling operations that occur 24 hours per day, seven days per week (24/7) would cause disturbance during more noise-sensitive early morning and nighttime hours. Residents would also be exposed to higher noise levels from increased traffic caused by truck hauling. Some residents would be exposed to temporary groundborne vibrations caused by pile driving where pumping plants are being modified. Even with the implementation of mitigation measures the impact would remain significant and unavoidable.
Recreation	**Phase 1 Project**
	Project construction could adversely affect recreation if boating is substantially restricted and/or construction noise substantially adversely affects the recreational experience of boaters along the Sacramento River. Although these temporary disturbances may affect the recreation experience for boaters, any such disturbance would be limited and can be relocated within the vicinity. For these reasons, this impact would be less than significant.
	Phase 2 and 3 Projects
	Construction of the Phase 3 Project would temporarily affect access to recreation facilities along the Sacramento River, such as marinas, as well as the Teal Bend Golf Club. Although temporary closure of sections of Garden Highway would be an inconvenience for recreationists, other travel routes would be available and could be used to access recreational facilities during the construction period. The quality of recreational opportunities is likely to be somewhat temporarily reduced in the vicinity of the Phase 2 and 3 Projects as a result of noise and visual disturbance from temporary

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
	levee construction activities. These impacts are considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level.
	Phase 4a Project
	No recreational facilities are located within the Phase 4a Project area. Therefore, the Phase 4a Project would not result in recreational impacts.
Visual Resources	**Phase 1 Project**
	Project construction activities could temporarily reduce the aesthetic qualities of the project area by introducing earthmoving equipment and other construction equipment, materials, and work crews into views. However, all changes would be temporary while construction is ongoing, and most construction activities would be distant and/or shielded from most viewers. For these reasons, this impact would be less than significant.
	Phase 2, 3, and 4a Projects
	The visual character of the Phase 2, 3, and 4a Project areas would be temporarily degraded by the presence and movement of heavy construction equipment. Under the Phase 3 and 4a Projects, a temporary but substantial source of light and glare would be created by 24/7 construction of cutoff walls along the Sacramento River east levee, NCC south levee, PGCC west levee, and NEMDC west levee; and 24-hours-per-day well drilling operations along the Sacramento River east levee. Changes in levee dimensions would not likely be noticeable; however, the removal of large, mature trees in scattered locations along the landside of the Sacramento River east levee would result in a substantial degradation in visual quality for several years until replacement trees in oak woodland planting areas have matured (approximately 10–15 years for some species, up to 100 years for oaks). No feasible mitigation is available to reduce the impact to a less-than-significant level in the near term. Therefore, the impact would remain significant and unavoidable.
Hazards and Hazardous Materials	**Phase 1 Project**
	Project construction would involve the storage, use, and transport of hazardous materials at the project site during construction activities. Compliance with federal, state, and local hazardous materials regulations would ensure the appropriate use, transport, and storage of hazardous materials during construction. Hazardous materials may be present at the RD 1001 borrow site and may result in the potential creation of a public health or environmental hazard. Therefore, this potential impact would be significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.
	Phase 2 Project
	No hazardous materials have been identified within the Phase 2 Project construction footprint or at borrow sites and the Phase 2 Project would not cause any significant hazards associated with the transport and handling of hazardous materials. Construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels, oils and lubricants, and cleaners commonly used in construction projects. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.
	Phase 3 and 4a Projects
	No significant hazards associated with the transport and handling of hazardous materials would result from construction of the Phase 3 Project. Construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels, oils and lubricants, and cleaners

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
	commonly used in construction projects. Construction contractors would be required to use, store, and transport hazardous materials in compliance with Federal, state, regional, and local regulations. One site, the Yuki Pear Farm, was the site of a large gasoline spill. Required remediation would take place prior to construction. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.
Utilities and Service Systems	**Phase 1 Project**
	No natural gas transmission lines, aerial or underground telephone lines, or underground cable lines are located in the project area, and there would be no impacts on these facilities. Project construction would not require relocation of or modifications to PG&E overhead power lines in NCC Reach D3 and is not expected to disrupt electrical service. This impact would be less than significant.
	Phase 2, 3, and 4a Projects
	The Phase 2, 3, and 4a Projects would involve relocation of irrigation facilities, including canals, wells, and pumps, as part of construction of levee improvements along the Sacramento River east levee and NCC south levee, along with replacement of the Elkhorn and Riverside Canals. Significant temporary interruptions of irrigation supply could occur if irrigation infrastructure is damaged during relocation. Power poles carrying electrical distribution and telephone lines would be relocated to make way for expansion of the levee along the landside of the Sacramento River east levee. Construction activities could damage identified and unidentified public utility infrastructure, resulting in temporary interruptions of service in the western Natomas Basin. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.
Airport Safety	**Phase 1 Project**
	The Phase 1 Project area is outside of the Airport Critical Zone (Perimeter B) and the 5-mile buffer area, therefore no impacts to airport safety would occur.
	Phase 2, 3, and 4a Projects
	Implementation of the Phase 2, 3, and 4a Projects would reduce hazardous wildlife attractants within the Airport Critical Zone (Perimeter B) by improving drainage on the Airport north bufferlands. Levee construction within Reaches C:4A–4B and B:5A–11A of the Sacramento River east levee would take place within the Airport Critical Zone (Perimeter B). Extensive night lighting of construction work and security lighting of construction staging areas at night could interfere with nighttime aircraft landing operations and create a safety hazard related to aircraft landings. Coordination with the Sacramento County Airport System would minimize safety hazards related to potential nighttime interference with aircraft landings. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.
Wildfire Hazards	**Phase 1 Project**
	According to the California Department of Forestry and Fire Protection's Fire Resource Assessment Program, the majority of Sutter County and the project site is located in a "non flammable" zone for wildland fires. No Very High Fire Hazard Severity Zones are located in or near Sutter County. In addition, Sutter County is not in a State Responsibility Area.

Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

Issue Area	Summary of Environmental Impact
	Phase 2, 3, and 4a Projects
	Although the Phase 2, 3, and 4a Project areas are located in either a "nonflammable" or "moderate" zones for wildland fires, the project components would take place in locations where physical and weather conditions could combine to lead to a high risk of fire hazard. Construction equipment or construction practices could ignite fires that may result in wildland fires and expose people or structures to a significant risk of loss, injury, or death. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to less-than-significant levels.
Environmental Justice	**Phase 1, 2, 3, and 4a Projects**
	The Phase 1, 2, 3, and 4a Projects would incrementally reduce the risk of flooding to existing residential, commercial, and industrial development in the Natomas Basin. Although there are low-income and minority populations present in a portion of the project areas, the flood damage reduction benefits of the project phases would accrue to all segments of the population in the Natomas Basin. Any potential environmental impacts on low-income and minority neighborhoods would be the same types of impacts experienced throughout the project areas (e.g., primarily temporary exposure to construction noise, dust, and light and glare during construction), and no permanent residential relocations would occur in low-income areas or areas with high minority populations.

Notes: AEP = annual exceedance probability; Airport = Sacramento International Airport; GGS/Drainage Canal = new canal designed to provide drainage and associated giant garter snake habitat; NBHCP = Natomas Basin Habitat Conservation Plan; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NO_X = oxides of nitrogen; NRHP = National Register of Historic Places; PGCC = Pleasant Grove Creek Canal; PM_{10} = respirable particulate matter; RD = Reclamation District; ROG = reactive organic gases; SAFCA = Sacramento Area Flood Control Agency; SHPO = State Historic Preservation Officer; TNBC = The Natomas Basin Conservancy; USACE = U.S. Army Corps of Engineers
Source: Data compiled by AECOM in 2009

Table 4.18-3
Summary of Quantifiable[1] Environmental Impacts Identified in Previous Environmental Documents for the Natomas Levee Improvement Program Landside Improvements Project Phase 1–4a Projects

Environmental Impact	Phase 1 Project	Phase 2 Project[2]	Phase 3 Project[3]	Phase 4a Project	Total
Potential Permanent Conversion of Important Farmland	N/A	180 acres	374.5 acres	676 acres	1,230.5 acres
Potential Permanent Habitat Loss[4]					
Rice	N/A	25 acres	45 (23) acres	1 (1.84) acre	71 (49.84) acres
Canals	N/A	1.875 (2) acres	16 (13.18) acres	6 (4.87) acres	23.875 (20.05) acres
Landside woodlands	N/A	19.71 (10.3) acres	37 (33.95) acres	18 (33.78) acres	74.71 (78.03) acres
Waterside woodlands	N/A	<1 acre	1 (1.39) acre	N/A	<2 (<2.39) acres
Cropland	N/A	140 (145.5) acres	115 (117.84) acres	473 (304.78) acres	728 (568.12) acres
Grasslands	N/A	152.09 (139.6) acres	69 (64.12) acres	66 (54.39) acres	287.09 (258.11) acres
Shaded riverine aquatic habitat	N/A	<1 acre	1 acre	4 (2.59) acres	<6 (<4.59) acres
Loss of elderberry shrubs	N/A	23 shrubs on Sacramento River east levee (landside)	63 shrubs	surveys in progress	86 shrubs (Phase 4a Project surveys in progress)
Potential Wetlands Filled[4]					
Temporary	N/A	348 (69.58) acres	70.42–354.01 (1) acres	1 acre	419.42–703.01 (71.58) acres
Permanent	N/A (0.07 acre)	16.42 (16.81) acres	28.04–33.04 (18.65) acres	19.76 (7–10) acres	64.22–69.22 (42.53–45.53) acres
Potential Temporary Traffic Increases					
Natomas Cross Canal south levee	240 trips/day	90 trips/day	N/A	20 trips/day	Not additive
Sacramento River east levee	N/A	950–1,200 trips/day	950–1,000 trips/day	2,200 trips/day	Not additive
Pleasant Grove Creek Canal west levee	N/A	N/A	100–200 trips/day	N/A	Not additive
Potential Construction-Related Road Closures	2-month closure of Garden Highway between West Catlett Road and Riego Road	Temporary closures of State Route 99 and lane closures on Garden Highway	Temporary/intermittent closure of approximately 1,000 feet of Garden Highway for approximately 8–12 weeks; temporary closure of Garden Highway at RD 1000 pumping station for removal and replacement of outfall pipes	Temporary/intermittent closure of approximately 1,000 feet of one lane and 1,200 feet of both lanes of Garden Highway for approximately 8–12 weeks; closure of Garden Highway (to through traffic) at three locations for up to 60 days; detours required	Not additive

Table 4.18-3
Summary of Quantifiable[1] Environmental Impacts Identified in Previous Environmental Documents for the Natomas Levee Improvement Program Landside Improvements Project Phase 1–4a Projects

Environmental Impact	Phase 1 Project	Phase 2 Project[2]	Phase 3 Project[3]	Phase 4a Project	Total
Potential Temporary Air Pollutant Emissions[5]					
Sacramento County:					
ROG	N/A	96/83 lb/day	75 lb/day	287.6 lb/day	Not additive
NO_X	N/A	437/379 lb/day	413 lb/day	1,476.8 lb/day	Not additive
PM_{10}	N/A	1,444/1,461 lb/day	971 lb/day	3,846.9 lb/day	Not additive
Sutter County:					
ROG	34 lb/day	138/218 lb/day	93 lb/day	101.7 lb/day	Not additive
NO_X	226 lb/day	729/1,139 lb/day	499 lb/day	527.0 lb/day	Not additive
PM_{10}	80 lb/day	2,162/6,478 lb/day	1,283 lb/day	1,259.5 lb/day	Not additive

Notes: N/A = not applicable; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter less than 10 microns in diameter; lb/day = pounds per day

[1] All values are approximate. Refer to the respective environmental documents for more detail including significance criteria, mitigation measures, and other aspects of the environmental analysis. Some quantifiable environmental impacts are not presented in this table because there is no significant difference between the impacts, or data are not quantifiable.

[2] Estimates include those originally identified in the Phase 2 EIR and EIS, and the subsequent Phase 2 SEIR, 1st Addendum to the Phase 2 EIR, and 2nd Addendum to the Phase 2 EIR.

[3] Estimates include those originally identified in the Phase 3 EIS and EIR, and the subsequent Addendum to the Phase 3 EIR.

[4] For some potential habitat and wetland impacts, estimates have been refined based on permit applications and consultation with resource agencies. These estimates are presented in parentheses and are based on the following sources: (1) for the Phase 1 Project, refined estimates are derived from the Clean Water Act Section 401 Water Quality Certification application submitted to the Central Valley Regional Water Quality Control Board on March 6, 2007; (2) for the Phase 2 Project, refined estimates are derived from the Phase 2 Final Biological Assessment dated May 2008 and the Request for Modification of the Phase 2 Section 404 Individual Permit (SPK-2007-0211) dated November 25, 2009; (3) for the Phase 3 Project, refined estimates are derived from the Phase 3 Final Biological Assessment dated March 2009, Amendment No. 2 to the Phase 3a Section 404 Individual Permit Application (SPK 2009-00513) dated August 31, 2009, and Phase 3b Request for Authorization Under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act dated October 8, 2009; and (4) for the Phase 4a Project, refined estimates are derived from the Phase 4a Draft Biological Assessment dated December 2009 and Phase 4a preliminary permit application (ENG Form 4345) Attachment A.

[5] For potential temporary air pollutant emissions, where two values are shown in a cell, the first represents the worst-case daily emissions during either the 2008 or 2009 calendar year, assuming that approximately 60% of the Sacramento River east levee improvements, including those in Reaches C:4A and C:4B, would be performed in a 3-month construction period in 2008, while the remaining 40% would be performed in a 6-month construction period in 2009. The second value represents the worst-case daily emissions if all of the levee improvements planned for the 2008 construction year were to be delayed until the 2009 calendar year and would be performed in a 6-month period.

Source: Data compiled by AECOM in 2009

4.18.4 SUMMARY OF PHASE 1–4a PROJECTS' MITIGATION

Appendix B4 contains a summary (in tabular form) of the mitigation measures contained in each of the above-listed certified/approved environmental documents and adopted in connection with the Phase 1–4a Projects. The mitigation measures contained in **Appendix B4** are provided as presented in the Phase 4a EIS and EIR because the Phase 4a EIS and EIR contain the most up-to-date mitigation commitments. It is important to note that although the mitigation commitments may apply to more than just the Phase 4a Project, the mitigation language has evolved with each certified and approved document, as new information becomes available, as more refined engineering and design details are available for each project phase, from lessons learned in the field (primarily from Phase 2 Project construction) about more effective techniques, and from ongoing coordination and consultation with regulatory agencies. Although the mitigation language has been modified in some of the mitigation measures, the essence of the mitigation commitment has remained the same, but has been enhanced and/or refined. The mitigation measure summary contains each mitigation commitment and to which project phase(s) the mitigation applies. The mitigation summary is provided in an appendix because it is too voluminous for inclusion in the main EIS/EIR volume.

4.18.5 SUMMARY OF PHASE 1–4a PROJECTS' SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

The following impacts that were identified as significant and unavoidable after implementation of mitigation in the relevant documents are incorporated by reference:

- conversion of Important Farmland to nonagricultural uses (Phase 2, 3, and 4a Projects);
- conflicts with lands under Williamson Act contracts (Phase 3 and 4a Projects);
- potential to temporarily physically divide or disrupt an established community (Phase 3 and 4a Projects);
- potential loss of mineral resources (Phase 4a Project);
- loss of woodland habitats (10–15 years until maturity) (Phase 4a Project);
- impacts on Swainson's hawk and other special-status birds (Phase 3 and 4a Projects);
- potential construction impacts on known prehistoric resources, discovery of human remains during construction, and damage to or destruction of previously undiscovered cultural resources (Phase 2, 3, and 4a Projects);
- temporary increase in traffic on local roadways during construction (Phase 2, 3, and 4a Projects);
- temporary emissions of reactive organic gases (ROG), oxides of nitrogen (NO_X), and respirable particulate matter less than 10 microns in diameter (PM_{10}) during construction (Phase 2, 3, and 4a Projects);
- generation of temporary, short-term construction noise (Phase 2, 3, and 4a Projects);
- temporary exposure of sensitive receptors to or generation of excessive groundborne vibration or noise (Phase 2 and 3 Projects);
- temporary exposure of residents to increased traffic noise levels from hauling activity (Phase 2, 3, and 4a Projects);
- changes in scenic vistas, scenic resources, and existing visual character of the project area (Phase 2, 3, and 4a Projects); and
- new sources of light and glare that adversely affect views (Phase 3 and 4a Projects).

5 CUMULATIVE AND GROWTH-INDUCING IMPACTS, AND OTHER STATUTORY REQUIREMENTS

5.1 CUMULATIVE IMPACTS

The following analysis includes a summary of the overall cumulative impacts of the Phase 1–4a Projects that were identified in previous environmental documents completed for the NLIP, as well as the analysis of the Phase 4b Project's cumulative impacts, taken together with other past, present, and probable (i.e., reasonably foreseeable) future projects producing related impacts, as required by NEPA implementing regulations (40 Code of Federal Regulations [CFR] Section 1508.7) and the State CEQA Guidelines (14 California Code of Regulations [CCR] Section 15130). The goal of such an exercise is twofold: first, to determine whether the effects of all such projects would be cumulatively significant; and second, to determine whether the Phase 4b Project individually would cause a "cumulatively considerable" (and thus significant) incremental contribution to any such cumulatively significant impacts. (See the State CEQA Guidelines [CCR Sections 15064(h), 15065(a)(3), 15130(a), 15130(b), and 15355(b)] and *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 120.)

The Council on Environmental Quality (CEQ) regulations implementing provisions of NEPA define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR Section 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions over time and differ from indirect impacts (40 CFR Section 1508.8). They are caused by the incremental increase in total environmental effects when the evaluated project is added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can thus arise from causes that are totally unrelated to the project being evaluated, and the analysis of cumulative impacts looks at the life cycle of the effects, not the project at issue.

Cumulative impacts are defined in the State CEQA Guidelines (CCR Section 15355) as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects (see also CCR Section 15130[a][1]). Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CCR Section 15355[b]).

Consistent with the State CEQA Guidelines (CCR Section 15130[a]), the following discussion of cumulative impacts focuses on significant and potentially significant cumulative impacts. The State CEQA Guidelines (CCR Section 15130[b]) state that:

> The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

5.1.1 GEOGRAPHIC SCOPE AND TIMEFRAME

The geographic area that could be affected by the NLIP, including the Phase 4b Project, varies depending on the type of environmental issue being considered. When the project's impacts are considered in combination with those other past, present, and future projects to identify cumulative impacts, the other projects considered may

also vary depending on the type of environmental effects being assessed. The general geographic area associated with the different environmental impacts of the NLIP, including the Phase 4b Project, defines the boundaries of the area used for compiling the list of projects considered in the cumulative impact analysis. **Table 5-1** presents the general geographic areas associated with the different resources addressed in this EIS/EIR.

Table 5-1
Geographic Areas that Would Be Affected by the NLIP, Including the Phase 4b Project

Resource Area	Geographic Area
Agriculture	Natomas Basin, with regional implications
Land use	Not applicable, because the only potential impacts on land use from the NLIP relate to possible inconsistency with adopted land use plans and policies, and inconsistency with policies is not cumulative. Land use is not addressed further in this cumulative impact analysis, but see Section 4.3, "Land Use, Socioeconomics, and Population and Housing," for the Phase 4b Project impact analysis.
Socioeconomics, and population and housing	Local (population and housing near the project site)
Geology, soils, and mineral resources	Individual construction sites, soil erosion repair sites, and other ground disturbance sites within the Natomas Basin
Hydrology	Drainage system on the west and east sides of the Natomas Basin and individual grading sites
Hydraulics	Sacramento River system in the vicinity of Natomas Basin
Groundwater	Natomas Basin
Water quality	Ditches and canals on the west and east sides of the Natomas Basin, with implications for the Sacramento River system in the vicinity of Natomas Basin
Biological resources	
Woodland habitat and wildlife corridors	Natomas Basin, with regional implications
Sensitive aquatic habitat	Natomas Basin
Special-status plant and wildlife species	Natomas Basin, with regional implications
Fish and aquatic habitats	Habitat at individual waterside improvement sites, with regional implications for species
Cultural resources	Individual ground disturbance sites, with regional implications
Paleontological resources	Individual ground disturbance sites within the Natomas Basin
Transportation and circulation	Roadway network in the Natomas Basin, with regional implications
Air quality	Regional (FRAQMD and SMAQMD); global for greenhouse gas emissions
Noise	Immediate vicinity of the individual sites of construction activity
Recreation	Local (facilities near construction sites)
Visual resources	Individual levee improvement sites and landscape level
Utilities and service systems	Local service areas
Hazards and hazardous materials	Individual construction and other ground disturbance sites
Airport safety	Airport
Wildlife hazards	Individual construction sites within the Natomas Basin
Environmental justice	Natomas Basin and affected Tribe; however, environmental justice is not addressed further in this cumulative impact analysis. See Section 4.17, "Environmental Justice," for the Phase 4b Project impact analysis.

Notes: Airport = Sacramento International Airport; FRAQMD = Feather River Air Quality Management District; SMAQMD = Sacramento Metropolitan Air Quality Management District
Source: Data compiled by AECOM in 2010

The timeframe for consideration of cumulative impacts is approximately 30 years, generally consistent with the timeframe for buildout of approved and proposed specific plan development projects in the Natomas Basin.

5.1.2 Approach to the Phase 4b Project Cumulative Impact Analyses

The Phase 4b Project cumulative impact analysis incorporates by reference the cumulative impact analyses from previous NLIP environmental documents. Information that was not known at the time of preparation of the earlier documents is also presented in this chapter, as well as any cumulative impacts not previously covered in the earlier documents. The analysis specifically addresses the potential cumulative effects from the overlap of construction of the Phase 3, 4a, and 4b Projects, if it occurs (i.e., a reasonable worst-case scenario). As discussed in Section 5.1.2.3, below, any overlapping construction of these three project phases may increase the severity of an environmental effect in the event that these project phases are constructed simultaneously.

5.1.2.1 Natomas Levee Improvement Program Documents Incorporated by Reference

Because this EIS/EIR provides project-level analysis that is tiered from previous program-level analysis, relevant material from the previous documents (listed below) is incorporated by reference. Incorporation by reference is encouraged by both NEPA (40 CFR Sections 1500.4, 1502.21) and CEQA (CCR Section 15150). Both NEPA and CEQA require citation to and a brief summary of the referenced material, as well as information about the public availability of the incorporated material. CEQA also requires citation to the state identification number of the EIRs cited. The program-level and cumulative impact analyses contained in the following documents are incorporated by reference herein:

- *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area*, State Clearinghouse No. 2006072098 (Local Funding EIR) (SAFCA 2007a), which evaluates impacts expected to result from the Phase 1 Project at a project level and the NLIP at a program level;

- *Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project*, State Clearinghouse No. 2007062016 (Phase 2 EIR) (SAFCA 2007b), which evaluates impacts expected to result from the Phase 2 Project at a project level and the remainder of the NLIP at a program level;

- *Environmental Impact Statement for 408 Permission and 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project* (Phase 2 EIS) (USACE 2008), which evaluates impacts expected to result from the Phase 2 Project at a project level and the remainder of the NLIP at a program level;

- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 3 Landside Improvements Project*, State Clearinghouse No. 2008072060 (Phase 3 EIS and EIR) (USACE 2009 and SAFCA 2009a), which evaluates impacts expected to result from the Phase 3 Project at a project level; and

- *Environmental Impact Statement and Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project*, State Clearinghouse No. 2009032097 (Phase 4a EIS and EIR) (USACE 2010 and SAFCA 2009b), which evaluates impacts expected to result from the Phase 4a Project at a project level.

Portions of these documents, where specifically noted, are summarized throughout this EIS/EIR. Printed copies of these documents are available to the public at USACE's office at 1325 J Street, Sacramento, California and are also available on USACE's Web site at http://www.spk.usace.army.mil. These documents are also available at SAFCA's office at 1007 7th Street, 7th Floor, Sacramento, California, during normal business hours, and on SAFCA's Web site, at http://www.safca.org/Programs_Natomas.html.

The previous NLIP environmental documents listed above included a programmatic and cumulative impact analysis of all NLIP project phases (1–4), including the phase now referred to as the Phase 4b Project. Refer to Chapter 1, "Introduction and Statement of Purpose and Need," for a summary of each project phase and **Table 4.18-1**, which presents the proposed components and construction timing of the project phases.

5.1.2.2 Potential Simultaneous Construction of the Phase 3, 4a, and 4b Projects

The Phase 3 Project was analyzed in the Phase 3 EIS and EIR (see Section 1.5.4.3, "Phase 3 Project"), and the Phase 4a Project was analyzed in the Phase 4a EIS and EIR (see Section 1.5.4.4, "Phase 4a Project"). The environmental impacts of the Phase 3 and 4a Projects are summarized in **Table 2-1** in Section 2.2.2, "No-Action Alternative—Implementation of Phase 1, 2, 3, and 4a Projects Only." The Phase 3 and 4a Projects could be constructed on a stand-alone basis, assuming no further action on the balance of the NLIP is taken.

Preliminary construction (canal work, utility relocation, vegetation removal, and demolition of structures) of the Phase 3 Project (known as the Phase 3a Project) began in fall 2009; however, major levee construction (known as the Phase 3b Project) would not begin until 2010, assuming receipt of all required environmental clearances and permits. Portions of the Phase 4a Project could be constructed at the same time as a portion of the Phase 3 Project, if Phase 3 Project construction were to extend into 2011, when Phase 4a Project construction is planned to begin.

Table 5-2 lists and summarizes the impacts that overlapped construction would intensify in the event that the Phase 3 Project (NEMDC South cutoff wall construction) and 50% of the Phase 4a Project are constructed simultaneously, and summarizes the effect of this overlap. The mitigation measures required for each impact identified in the environmental document for each project phase (Phases 1–4a) would be adopted by SAFCA and implemented. The mitigation measures required for the Phase 4b Project would be implemented by either USACE or SAFCA, depending on the ultimate agency constructing the Phase 4b Project. Quantitative analysis of potential air quality impacts resulting from this potential concurrent construction scenario is provided in Section 4.11, "Air Quality."

5.1.3 Related Projects in the Natomas Basin

Past, present, and probable future projects are those projects that have already been constructed, are currently under construction, or are in various stages of planning but that have yet to initiate construction. Some of these projects are planned to be under construction during the period in which the Phase 4b Project would be under construction (anticipated 2012–2016), while others are expected to be developed after 2016. These projects are organized into the following five categories, as in the previous environmental documents for the NLIP:

- Natomas Levee Improvement Program,
- other flood damage reduction system improvements,
- Sacramento International Airport Master Plan,
- development projects, and
- utility infrastructure projects.

The related projects included in the previous documents are listed below by category with their current (as of January 2010) approval/construction status. Since preparation of the earlier documents, a few additional related projects have become reasonably foreseeable. Those new projects are described in detail below. Those projects in which there have been no substantial changes are only listed.

Table 5-2
Summary of Impacts of Overlapping Construction of the Phase 3, 4a, and 4b Projects

Phase 4b Project Impact (and Significance Conclusion)	Effect on Impact from Overlapping Construction
Impact 4.7-f: Impacts on Swainson's Hawk and Other Special-Status Birds (Significant and Unavoidable)	Visual and noise disturbance of active nests could be increased where the Phase 3 and 4a Projects are adjacent to each other in Reach B:9B–10 of the Sacramento River east levee. This impact could also occur in the event that Phase 4a Project haul trucks would transport soil material from the Elkhorn Borrow Area south using the landside off-road haul route through the overlap between the Phase 3 and 4a Projects' coustruction sites in Reaches B:9B–10 of the Sacramento River east levee. Overlapping construction between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project at the same time that the Novak borrow site is being used to provide soil borrow for the Phase 4a Project in Reach B:10–15. This could potentially add to each phase's traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site, and cause visual and noise disturbance of active nests in Sacramento River east levee Reach B:12. The potential effects on nesting of special-statns birds from overlapping construction are speculative in nature, but this possible occurrence would tend to intensify this impact.
Impact 4.7-h: Impacts on Northwestern Pond Turtle and Burrowing Owl (Less than Significant with Mitigation Incorporated)	Same as above for Impact 4.7-f.
Impact 4.10-a: Temporary and Short-term Increases in Traffic on Local Roadways (Significant and Unavoidable)	The Phase 4a and 4b Projects would primarily use different borrow sites; however, some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other's traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site.
Impact 4.10-c: Temporary and Short-term Disruption of Emergency Service Response Times and Access (Less than Significant with Mitigation Incorporated)	For the Phase 4b Project, Garden Highway would be closed to through traffie south of San Juan Road. However, this closure would not be expected to affect residents north of San Juan Road because emergency vehicles would reach them either via San Juan Road, Del Paso Road, or I-5. Overlap of the Phase 4a and 4b Projects' construction-related temporary road closures in 2012 could result in temporary increases in traffic levels as traffic is detoured or slowed on some local roadways, potentially interfering emergency access and evacuation routes. The extent and intensity of project construction activities may affect access for emergency services.
Impact 4.11-a: Temporary Emissions of ROG, NO_X, and PM_{10} during Construction (Significant and Unavoidable)	The combination of construction equipment from the Phase 3, 4a, and 4b Projects operating simultaneously would generate greater total emissions compared to the emissions generated by construction of a single Phase 3, 4a, or 4b Project. See Section 4.11, "Air Quality," for quantitative analysis.
Inupact 4.11-b: General Conformity with the Applicable Air Quality Plan (Less than Significaut)	Construction-generated emissions were estimated under the worst-case assumption that portions of the Phase 3 and 4a Projects would overlap with the Phase 4b Project during 2012. See Section 4.11, "Air Quality," for quantitative analysis.

Table 5-2
Summary of Impacts of Overlapping Construction of the Phase 3, 4a, and 4b Projects

Phase 4b Project Impact (and Significance Conclusion)	Effect on Impact from Overlapping Construction
Impact 4.12-c: Temporary and Short-term Exposure of Residents to Increased Traffic Noise Levels from Truck Hauling Associated With Borrow Activity (Significant and Unavoidable for exterior residential noise standards)	The Phase 4a and 4b Projects would primarily use different borrow sites; however, some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other's traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site. Most sensitive noise receptors in this area, however, are located on the opposite side (waterside) of the levee, and would be shielded. Some landside residences would nonetheless be affected.
Impact 4.14-a Potential Temporary Disruption of Irrigation Water Supply and Impact 4.14-b Potential Disruption of Utility Service (Less than Significant with Mitigation Incorporated)	Detailed project design would include consultation with all known service providers to identify infrastructure locations and appropriate protection measures, and consultation would continue during construction to ensure avoidance/protection of facilities as construction proceeds to minimize service disruptions. The extent and intensity of project construction activities may affect service providers' abilities to quickly repair damage and/or restore interrupted service.
Impact 4.16-d: Interference with an Adopted Emergency Evacuation Plan (Less than Significant with Mitigation Incorporated)	For the Phase 4b Project, Garden Highway would be closed to through-traffic south of San Juan Road. However, this closure would not be expected to affect residents north of San Juan Road because emergency vehicles would reach them either via San Juan Road, Del Paso Road, or I-5. Overlap of the Phase 4a and 4b Projects' construction-related temporary road closures in 2012 could result in temporary increases in traffic levels as traffic is detoured or slowed on some local roadways, potentially interfering with emergency access and evacuation routes. The extent and intensity of project construction activities may affect access for emergency services.

Notes: I-5 = Interstate 5; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases
Source: Data compiled by AECOM in 2010

5.1.3.1 NATOMAS LEVEE IMPROVEMENT PROGRAM

The NLIP includes:

- Natomas Cross Canal South Levee Phase 1 Improvements (Phase 1 Project),
- Post-2010 Seepage Remediation projects,
- Bank Protection Project/Erosion Control projects,
- Phase 2 Project,
- Phase 3 Project (includes Phases 3a and 3b),
- Phase 4a Project, and
- Phase 4b Project (the subject of this EIS/EIR).

5.1.3.2 OTHER FLOOD DAMAGE REDUCTION SYSTEM IMPROVEMENTS

Other flood damage reduction system improvement projects were previously addressed in the documents listed in Section 5.1.3:

- SAFCA Levee Integrity Program (specific construction activities are not yet planned, designed, or funded, and their timing is not known),
- California Department of Water Resources/USACE Repairs to Critical Erosion Sites (repairs to more than 100 of the most critical sites [of 250 total] have been completed; two of these sites are along the bank of the Sacramento River east levee between the NCC and the American River, but these improvements do not overlap temporally with construction for the Phase 4b Project), and
- Sacramento County Airport System (SCAS) Management of Land Acquired via the SAFCA/SCAS Land Exchange (approved by SAFCA as part of the Phase 4a Project).

5.1.3.3 SACRAMENTO INTERNATIONAL AIRPORT MASTER PLAN

The *Sacramento International Airport Master Plan* (SCAS 2007) is an adopted plan; phases previously addressed in the documents listed in Section 5.1.3 are:

- SMF Master Plan Phase 1 (2007–2013) (currently under construction),
- SMF Master Plan Phase 2 (2014–2020), and
- SMF Master Plan Phase 4a (after 2020).

5.1.3.4 DEVELOPMENT PROJECTS

The following development projects were previously addressed in the documents listed in Section 5.1.3:

- Camino Norte Project (annexation hearing anticipated December 2010),
- Greenbriar (annexation completed May 2008),
- Sutter Pointe Specific Plan (EIR certified and specific plan adopted June 2009),
- Metro Airpark Specific Plan (approved plan),
- Natomas Panhandle Annexation (annexation hearing anticipated in summer 2010), and
- West Lakeside Project (the Natomas Unified School District is currently proposing a high school on the site, which is currently under environmental review).

Approved projects listed above are not yet under construction because of the building moratorium in the Natomas Basin.

5.1.3.5 UTILITY INFRASTRUCTURE PROJECTS

The following utility infrastructure projects were previously addressed in the documents listed in Section 5.1.3:

- American Basin Fish Screen Habitat Improvement Project (ROD issued April 2009),
- Western Area Power Administration Transmission Line/Sacramento Area Voltage Support Project (in environmental review),
- Placer Parkway Corridor Preservation Project (implementation anticipated by 2020),

- Downtown-Natomas-Airport Light Rail Transportation Project (environmental review complete for first segment, construction anticipated to commence in summer 2009),
- Sacramento Municipal Utility District Power Line–Elkhorn Substation Capacity Expansion Project (in construction),
- Sacramento River Water Reliability Study (on-going), and
- Upper (anticipated to be completed in 2010) and Lower Northwest Interceptor Projects (completed).

5.1.4 Other Projects Requiring Section 408 Authorization

As described in Chapter 1, "Introduction and Statement of Purpose and Need," for SAFCA to implement the Phase 4b Project (assuming no Federal participation), SAFCA would request Section 408 permission from USACE to alter a Federal project levee. **Table 5-3** identifies the other projects in the Sacramento and San Joaquin River systems where USACE has completed Section 408 authorizations, is currently processing requests for Section 408 authorizations, or expects to receive requests for Section 408 authorizations in the near future.

Table 5-3
Other Section 408 Projects

Flood Damage Reduction Project or System	Project Title	Lead Agency/Agencies	Status of Section 408 Request
Approved Section 408 Projects			
Sacramento River Flood Control Project	Feather River Segment 1 and 3 Improvements	Three Rivers Levee Improvement Authority	Approved
Sacramento River Flood Control Project	Feather River Segment 2 Improvements	Three Rivers Levee Improvement Authority	Approved
Sacramento River Flood Control Project	Natomas Cross Canal and Sacramento River modifications, Phase 2 Project	SAFCA	Approved
Sacramento River Flood Control Project	Feather River Levee Setback at Star Bend	Levee District 1 of Sutter County	Approved
Sacramento River Flood Control Project	Natomas Levee Improvement Program, Phase 3 Project	SAFCA	Approved
Ongoing Section 408 Projects			
Sacramento River Flood Control Project	Natomas Levee Improvement Program, Phase 4a Project	SAFCA	Decision anticipated 2010
Sacramento River Flood Control Project	Natomas Levee Improvement Program, Phase 4b Project (evaluated in this EIS/EIR)	SAFCA	Decision anticipated 2010
Sacramento River Flood Control Project	River Islands Project	Califia, LLC	Decision anticipated 2010
Sacramento River Flood Control Project	2010 Improvements	West Sacramento Flood Control Agency	Decision anticipated spring 2010
Sacramento River Flood Control Project	2011 Improvements	West Sacramento Flood Control Agency	Decision anticipated winter 2011
Anticipated Future Section 408 Projects			
San Joaquin River Flood Control System	Levee Seepage Area Project	Reclamation District 17	Decision anticipated 2011
San Joaquin River Flood Control System	Urban Protection Project	San Joaquin Area Flood Control Agency	Decision anticipated 2011
Sacramento River Flood Control Project	Bay Delta Conservation Plan	California Department of Water Resources	Decision anticipated 2011

Source: Compiled by AECOM in 2010

5.1.5 CUMULATIVE IMPACT ANALYSIS

5.1.5.1 AGRICULTURAL RESOURCES

Phase 1–4a Projects

Implementation of the Phase 1–4a Projects would involve the conversion of large acreages of Important Farmland (Prime Farmland and Farmland of Statewide Importance) to managed marsh and managed grassland at borrow sites, and would entail the conversion of portions of agricultural parcels to nonagricultural uses at levee toe widening, berm, and new canal alignment locations. USACE and SAFCA determined that the conversion of agricultural land that would result from the Phase 1–4a Projects, in combination with the past, current, and probable future conversions of Important Farmland in the Natomas Basin, would be significant and unavoidable because it is not feasible to replace farmland by creating new farmland after it has been converted to nonagricultural uses. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects **would result in a cumulatively considerable incremental** contribution to the cumulatively significant impact on loss of Important Farmland (Prime Farmland and Farmland of Statewide Importance).

Phase 4b Project

As described in Section 4.2, "Agricultural Resources," the estimated maximum total of Important Farmland that is expected to be permanently converted would be 705 acres for the Adjacent Levee Alternative (Proposed Action), for a total of approximately 1,455 acres for the entire NLIP.

The Phase 4b Project is expected to result in the conversion of some additional Important Farmland to nonagricultural uses in Sacramento River east levee Reach A:16, along the west levees of NEMDC North and the PGCC, and the south levee of the NCC; as part of several canal relocations; in detention basins that would be created in the Triangle Properties Borrow Area; and as part of conversion of a portion of the Brookfield Borrow Site to managed marsh.

The Natomas Basin has already experienced the conversion of a substantial area of agricultural land, much of it Prime Farmland and other categories of Important Farmland, to residential and commercial development. The Natomas Basin is the focus of much of the growth planning in the Sacramento area, in both Sutter and Sacramento Counties, and substantial losses of Important Farmland to urban development are expected to continue in this area. As noted in Section 3.2.2, "Agricultural Resources," Important Farmland in the Natomas Basin totaled approximately 40,000 acres in 2006, the last year for which California farmland mapping data are available, representing 6% of the total of approximately 715,000 acres of Important Farmland mapped by the Farmland Mapping and Monitoring Program in Sutter and Sacramento Counties in 2006. Of this amount, approximately half is expected to be converted to developed uses and half maintained in agriculture or in a condition compatible with future agricultural use (i.e., undeveloped) within The Natomas Basin Conservancy parcels, Airport north bufferlands, lands anticipated to be maintained in an undeveloped condition as part of the Joint Vision, and land managed by SAFCA. The loss of an additional approximately 20,000 acres in the Natomas Basin would continue an overall trend of net loss of Important Farmland that has been documented in Sutter and Sacramento Counties for each consecutive 2-year interval of mapping by the California Department of Conservation from 1992 through 2006. As described elsewhere in this EIS/EIR, development of land in the Natomas Basin is consistent with regional land use planning efforts (see Section 5.2, "Growth Inducement") which promote the concentration of urban growth within the borders of existing cities and their immediate adjacent areas, including the Natomas Basin specifically, and discourage both sprawling development and development expansion into existing nonurbanized floodplains that would result in greater regional conversion of agricultural land to nonagricultural uses. (See Section 5.2, "Growth Inducement"; Section 6.11, "Executive Order 11988, Floodplain Management"; and Section 6.14, "Farmland Protection Policy Act," for more discussion of this issue.)

Nevertheless, the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would result in the conversion of agricultural land to nonagricultural uses and, in combination with the conversions of Important Farmland in the Natomas Basin associated with past, current, and future projects, **would result in a cumulatively considerable incremental contribution** to the cumulatively significant impact on loss of Important Farmland (Prime Farmland and Farmland of Statewide Importance).

5.1.5.2 GEOLOGY, SOILS, AND MINERAL RESOURCES

Phase 1–4a Projects

Grading and other earthmoving activities associated with the Phase 1–4a Projects could result in temporary, localized soil erosion and topsoil loss. These site-specific impacts were determined to be less than significant, with implementation of mitigation measures (specifically, construction Best Management Practices [BMPs]), and any residual impacts would not combine with the effects of any other activities. USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

Grading and other earthmoving activities associated with the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative could result in temporary and short-term localized soil erosion and topsoil loss. These site-specific impacts would be less than significant, with implementation of construction BMPs (Mitigation Measure 4.4-a[1]), and any residual impacts are not expected to combine with the effects of any other activities. Each project would implement construction BMPs. Therefore, implementation of the Phase 4b Project and related projects would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on geology and soils because the impact would be temporary, short-term, and soil erosion and loss of topsoil would be localized. Most of the Natomas Basin has been designated MRZ-1, where it has been determined that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence (City of Sacramento 2009b). Some small MRZ-3-designated zones, where the significance of mineral deposits in that area cannot be evaluated from existing data, are located in the northwestern and southeastern parts of the Basin. The West Lakeside borrow site contains a small area zoned MRZ-3, from which borrow material would be excavated, potentially removing economically valuable minerals, if they are present. However, as noted in Impact 4.4-c, "Potential Loss of Mineral Resources," borrow materials needed for project implementation would be limited to earthen materials (i.e., soils) and would not consist of sediments that would be considered aggregate resources. Therefore, implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative and related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.3 HYDROLOGY AND HYDRAULICS

Phase 1–4a Projects

The Phase 1–4a Projects would not significantly alter water surface elevations in the project area or in the larger Sacramento River Flood Control Project (SRFCP), or contribute cumulatively to any such alteration. Therefore, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

As discussed in Section 4.5, "Hydrology and Hydraulics," and in **Appendix C1**, a hydraulic impact analysis was performed to analyze the cumulative impacts of combining the Phase 4b Project with Federally authorized "early implementation" improvements to Folsom Dam and improvements to the SRFCP's urban levees aimed at

providing urban areas outside the Natomas Basin with 200-year (0.005 annual exceedance probability [AEP]) flood damage reduction. The Phase 4b Project would not significantly alter water surface elevations in the project area or in the larger SRFCP, or contribute cumulatively to any such alteration. The widening of levees along the Sacramento River east levee, raising of levees along the PGCC and NEMDC, modification of irrigation and drainage infrastructure, and borrow activities on large parcels could interfere with the functioning of local drainage systems and alter local surface drainage. Project design would incorporate measures to prevent a significant drainage disruption or alteration in runoff patterns (Mitigation Measure 4.5-b), and any temporary impacts would be limited to the vicinity of the individual disturbance sites. Each related project that would discharge stormwater runoff would also be required to comply with NPDES discharge permits from the Central Valley Regional Water Quality Control Board (RWQCB), which are designed to prevent significant water quality-related impacts. Therefore, implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative and related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.4 GROUNDWATER

Phase 1–4a Projects

USACE and SAFCA determined that that Phase 1 and 2 Projects would not have a significant effect on groundwater; however, the Phase 3 and 4a Projects would have the potential to result in significant impacts on groundwater recharge due to reduced irrigated lands covered by the footprint of the proposed levee improvements, increased recharge from the proposed canal improvements, and changes to land use and irrigation practices following excavation of soil and reclamation of the potential borrow sites. Overall, the Phase 3 and 4a Projects would have a small positive impact on groundwater supplies and storage in the Natomas Basin, and a small negative impact on groundwater east of the Natomas Basin, based on existing conditions. Overall, the cumulative impact of the Phase 3 and 4a Projects on future groundwater conditions would be negligible. USACE and SAFCA further determined that it would be unlikely that related projects would substantially adversely affect groundwater recharge, although as lands are converted from agricultural use to developed uses, some reduction in groundwater recharge from deep percolation of irrigation water can be expected. Therefore, USACE and SAFCA determined that the Phase 3 and 4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

The Phase 4b Project's groundwater impacts are the same for both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative because changes in land uses and potential changes in groundwater recharge are the same. The evaluation of potential groundwater impacts prepared by Luhdorff & Scalmanini Consulting Engineers investigated the effects on groundwater from excavation of borrow sites for the Phase 2, 3, and 4a Projects (see **Appendix C2**). Excavation and subsequent reclamation of several borrow areas being proposed for use as part of the Phase 4b Project could have an indirect effect on groundwater conditions if the land use and existing water supply were to change following reclamation. After reclamation, detention basins/grasslands may be created at the Triangle Properties Borrow Area, with the remaining acreage returned to agricultural uses. The creation of detention basins would have a minimal effect on recharge, as the land is currently used for rice production. Although, the new Phase 4b Project borrow sites would be returned to similar land uses as under pre-construction conditions which include agriculture, habitat, and open space, deep percolation from irrigated farmland would decrease somewhat. Alternately, the Phase 4b Project would serve to increase deep percolation through seepage from canals due to canal improvements. Canal improvements include relocation of the West Drainage Canal, Riego Road Canal, Vestal Drain ditch, Morrison Canal, and private irrigation and drainage canals. In addition, groundwater pumping would decrease due to the planned transition to surface water supply at the Brookfield Borrow Site, 100 acres of which would be converted to managed marsh.

Current groundwater levels in the Phase 4b Project area vary widely, depending upon soil type and subsurface stratigraphy; groundwater levels also vary by season, with higher levels in winter than in summer. The post-reclamation land uses are not expected to significantly change this variability. Overall, there would be an estimated slight net increase of 700 acre feet per year (afy) in groundwater levels and storage in the Natomas Basin for existing conditions. For future (2030) conditions, that increase would be 260 afy. The effect on subsurface outflow to the east would be slightly negative for existing conditions (-80 afy) and slightly positive for future (2030) conditions (60 afy). Therefore, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.5 LOCAL DRAINAGE

Phase 1–4a Projects

The widening of levees and construction of landside seepage berms along the Sacramento River east levee, associated modification of irrigation and drainage infrastructure, and borrow activities on large parcels associated with the Phase 1–4a Projects could interfere with the functioning of local drainage systems and alter local surface drainage. Project design would incorporate measures to prevent a significant drainage disruption or alteration in runoff patterns, and any temporary effects would be limited to the vicinity of the individual disturbance sites. Each related project that would discharge stormwater runoff would also be required to comply with NPDES discharge permits from the Central Valley RWQCB, which are designed to prevent significant water quality-related impacts. Therefore, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

The Phase 4b Project would include widening of levees and construction of landside seepage berms along the Sacramento River east levee, associated modification of irrigation and drainage infrastructure, and borrow activities on large parcels: these activities could interfere with the functioning of drainage systems and alter surface drainage. Project design would incorporate measures to prevent a significant drainage disruption or alteration in runoff patterns, and any temporary effects would be limited to the vicinity of the individual disturbance sites. Each related project that would discharge stormwater runoff would also be required to comply with NPDES discharge permits from the Central Valley RWQCB, which are designed to prevent significant water quality-related impacts. Therefore, the Phase 4b Project **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.6 WATER QUALITY/FISHERIES

Construction activities have the potential to temporarily degrade water quality and fish habitat and populations through the direct release of soil and construction materials into water bodies or the indirect release of contaminants into water bodies through runoff. Related projects, including the extensive array of development projects anticipated in the Natomas Basin and SAFCA's bank protection projects, would have a similar potential to release materials into watercourses that support fish and other aquatic resources. Potential sedimentation, increased turbidity, or the release and exposure of contaminants could adversely affect fish and aquatic habitats.

Phase 1–4a Projects

For the Phase 1 and 2 Projects, USACE and SAFCA determined that compliance with the regulatory regime, design of features for fish habitat and shaded riverine aquatic (SRA) habitat, and implementation of BMPs and a storm water pollution prevention plan (which would be required for related projects as well) would ensure that

these impacts would be less than significant and **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

For the Phase 3 and 4a Projects, the implementation of BMPs and adherence to the conditions of a storm water pollution prevention plan would ensure that the requirements of the Clean Water Act and Porter-Cologne Water Quality Control Act are met. Given the temporary nature of any impacts and the protections afforded by regulatory programs under the Clean Water Act and Porter-Cologne Water Quality Control Act, any degradation of surface waters by construction activities of the Phase 3 and 4a Projects and related projects would be minimized. Consequently, the potential impacts of project construction are not expected to make a considerable contribution to a significant cumulative impact on water quality, fish or fish habitat, or other aquatic species. Therefore, USACE and SAFCA determined that the Phase 3 and 4a Projects' Proposed Actions, as well as the Phase 1 and 2 Projects, **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Under the Levee Raise-in-Place (Phase 3 Project) and the Raise and Strengthen Levee in Place (RSLIP) (Phase 4a Project) Alternatives, however, removal of woody vegetation from the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments could have a substantial effect on SRA habitat along this levee. The loss of SRA habitat along the Sacramento River and reduction in input of woody debris associated with this removal could be a significant contribution to an already substantial historical loss of SRA habitat and woody debris; it is unknown whether adequate mitigation could be provided to compensate for this impact. Given these circumstances, USACE and SAFCA determined that the Levee Raise-in-Place and RSLIP Alternatives **could result in a cumulatively considerable incremental contribution** to a cumulatively significant impact related to loss of SRA habitat and woody debris.

Phase 4b Project: Water Quality

Under the Phase 4b Project, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would involve essentially the same construction activities and differ only in that under the Fix-in-Place Alternative, the Sacramento River east levee (Reach A:16–20) would not be widened to the landside to as great an extent. The implementation of BMPs and adherence to the conditions of a storm water pollution prevention plan (Mitigation Measures 4.6-a and 4.6-b) would ensure that the requirements of the Clean Water Act and Porter-Cologne Water Quality Control Act are met. Given the temporary nature of any impacts, and the protections afforded by regulatory programs under the Clean Water Act and Porter-Cologne Water Quality Control Act, any degradation of surface waters by construction activities of the Phase 4b Project and other projects would be required to implement similar measures to prevent and minimize adverse impacts to water quality. Consequently, the Phase 4b Project's potential construction impacts **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Construction of the Phase 4b Project, combined with previous project phases of the NLIP as well as other land uses changes in the Natomas Basin that would occur through 2030, would result in slight groundwater quality degradation in some areas and improvements in other areas. The primary impact on groundwater quality would be increased salt accumulation in the Natomas Basin resulting from reduced groundwater inflow from the west and north and reduced groundwater outflow to the east of the Natomas Basin (see **Appendix C4**). These reductions, however, represent a small percentage of the total estimated groundwater inflow and outflow, and the water quality impacts are not expected to be measurable. Therefore, the Phase 4b Project's potential construction impacts on both surface and groundwater quality **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project: Fisheries

For the Phase 4b Project, vegetation that may provide SRA habitat would be removed to some extent under all alternatives. As noted in Section 3.7.2.1, under "Fisheries," modifications of the channels bordering the Natomas

Basin have resulted over time in homogenous, trapezoidal channels lacking in-stream structure with narrow and sparse bands of riparian vegetation that provide only limited SRA habitat functions and limited recruitment of large woody debris. Combined, these alterations have resulted in marginal habitat conditions that provide only limited habitat functions for most native fish species and other aquatic organisms.

The Adjacent Levee Alternative (Proposed Action) would involve removal of a less than of an acre of SRA habitat for pumping plant modifications and as part of raising the west levee of NEMDC North. A variance would be requested for removal of waterside vegetation (including SRA habitat) along NEMDC South, which would avoid loss of SRA habitat in this area. However, if full compliance with USACE vegetation guidance is required, approximately 11 acres of waterside vegetation (including SRA habitat) would have to be removed from the NEMDC South in a worst-case scenario. The Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action) in terms of its potential construction-related impacts on habitats that support fish and other aquatic resources; however, because an adjacent levee would not be constructed under the Fix-in-Place Alternative, an estimated 19 acres of vegetation (including SRA habitat) would be required to be removed along the waterside of Sacramento River east levee Reach A:16–20 to comply with USACE vegetation guidance. This would be in addition to the removal of approximately 11 acres of waterside vegetation (including SRA habitat) from the NEMDC South that would be required if a variance is not granted. Mitigation Measure 4.7-a would require replacement of SRA habitat; however, it may not be possible to create enough suitable SRA habitat to compensate for this loss. As noted above, historic channel alterations have resulted in marginal habitat conditions that provide only limited habitat functions for most native fish species and other aquatic organisms. Therefore, combined with these previous channel alterations, the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact related to loss of SRA habitat and woody debris.

5.1.5.7 SENSITIVE AQUATIC HABITATS

Phase 1–4a Projects

USACE and SAFCA determined that the Phase 1 Project would not have a significant effect on sensitive aquatic habitats; however, the Phase 2, 3, and 4a Projects would include excavation and the placement of fill in sensitive aquatic habitats, resulting in both temporary and permanent effects. With the exception of The Natomas Basin Conservancy (TNBC)-managed lands and Airport mitigation sites that have been developed in the last decade, the overall trend in wetlands and other aquatic habitats within the Natomas Basin is a reduction in acreage and habitat values. Because the Phase 2, 3, and 4a Projects would include the creation of acreages of waters of the United States that are expected to more than offset the filling and dewatering of waters of the United States included in these project phases, and because new jurisdictional habitats would be created and managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost, USACE and SAFCA determined that overall effects of the Phase 2, 3, and 4a Projects would be beneficial. Therefore, the Phase 2, 3, and 4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

With the exception of TNBC-managed lands and Airport mitigation sites that have been developed in the last decade, the overall trend in wetlands and other aquatic habitats within the Natomas Basin is a reduction in acreage and habitat functions. As described in the NBHCP, approximately one-fourth to one-fifth of the 53,000-acre Basin contained areas of seasonal open water or riparian scrub historically, as indicated by 1908 mapping. Since 1914, land reclamation and reclamation facilities, canals, levees, and pumping stations have allowed over 80% of the Basin to be converted to agricultural production, with irregular small-scale topographic features of the earlier landscape having largely been eliminated by agriculture. As part of this conversion, the drainage pattern of the Basin was altered to collect runoff into canals, from which the runoff is pumped into the surrounding canals and

Sacramento River. Except on TNBC parcels and other mitigation lands, natural vegetation in the Basin is now primarily found along irrigation canals, drainage ditches, pastures, and uncultivated fields.

The Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would result in permanent impacts to approximately 199 acres and temporary impacts to approximately 324 acres of wetlands and other waters of the United States. Proposed mitigation for the these impacts includes the creation of at least 1 acre of irrigation/drainage canal or 1 acre of seasonal wetland for every acre that is lost and/or that irrigation/drainage function shall be replaced (Mitigation Measure 4.7-c). The mitigation ratio that is ultimately required will be determined by USACE through the Section 404 permitting process. Features planned in the Phase 4b Project (under both action alternatives) would provide aquatic habitat that has been designed to offset the effects described above. These features include the creation of up to 100 acres of managed marsh at the Brookfield Borrow Site, much of which would meet the criteria for waters of the United States, including wetlands, or at another site approved by the U.S. Fish and Wildlife Service (USFWS).

Overall, because the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would include the creation of waters of the United States that are expected to be more extensive than those filled by the Phase 4b Project, and because implementing this mitigation measure would ensure that new jurisdictional waters would be managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost, the Phase 4b Project, with implementation of Mitigation Measure 4.7-c, would be beneficial, and thus **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.8 TERRESTRIAL BIOLOGICAL RESOURCES

Phase 1–4a Projects

Implementation of the Phase 1–4a Projects has the potential to contribute to the loss or degradation of sensitive habitats and to adversely affect special-status terrestrial species (special-status plants, valley elderberry longhorn beetle, giant garter snake, Swainson's hawk and other nesting raptors, and burrowing owl). These effects could contribute to species declines and losses of habitat that have led to the need to protect these species under the Federal Endangered Species Act (ESA) and California Endangered Species Act (CESA).

Because minimization, avoidance, and compensation measures would be implemented in accordance with the requirements of the ESA, CESA, and other relevant regulatory requirements, and the Phase 1 and 2 Projects would include additional habitat protection and enhancement components, potential adverse effects on other special-status species and on sensitive habitats would be reduced to a less-than-significant level. Similarly, each related project that would adversely affect special-status species would also be required to comply with ESA, CESA, and other regulatory requirements. For these reasons, USACE and SAFCA determined that the Phase 1 and 2 Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Implementation of the Phase 3 and 4a Projects' Proposed Actions and mitigation measures would ensure that potential adverse impacts on special-status species and sensitive habitats would be reduced or avoided in accordance with the requirements of the ESA, CESA, and other regulatory programs that protect habitats. The Phase 3 and 4a Projects incorporate habitat creation, modification, and preservation components designed to offset the projects' adverse impacts. In addition, mitigation measures require further development of these habitat improvement components, including preparation and approval of management plans. Successful implementation of these mitigation measures would result in permanent protection and management of giant garter snake habitat, including creation and enhancement of connectivity between giant garter snake populations in the Natomas Basin, which is expected to result in an overall improvement of habitat conditions for giant garter snakes in the Basin. An increase in permanently protected foraging habitat for Swainson's hawk, eventual long-term increase in

potential nesting habitat, and preservation of existing nest sites would also maintain or improve current conditions for this species in the Natomas Basin. For these reasons, USACE and SAFCA determined that the Phase 3 and 4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Because of its inclusion of erosion control improvements at one site along the Sacramento River east levee, the Levee Raise-in-Place (Phase 3 Project) and RSLIP (Phase 4a Project) Alternatives would involve removal of as much as 22.5 acres and 21 acres, respectively, of riparian woodland on the waterside of the levee. In addition to its overall value as habitat for various species, this woodland supports active Swainson's hawk nests, elderberry shrubs, and other important biological resources. Adverse impacts on these resources on the waterside of the levee would be more difficult to mitigate than the adverse impacts from the adjacent setback levee footprint on the landside of the levee under the Phase 3 and 4a Projects' Proposed Actions, and it is uncertain whether adequate compensation could be developed for the extensive loss of mature waterside vegetation under these alternatives. USACE and SAFCA determined that it is possible that the Levee Raise-in-Place and RSLIP Alternatives **could result in a cumulatively considerable incremental contribution** to a cumulatively significant impact related to the extensive loss (up to 21–22.5 acres) of mature waterside riparian woodland that supports active Swainson's hawk nests, elderberry shrubs, and other important biological resources.

Phase 4b Project

Implementation of the Phase 4b Project has the potential to contribute to the loss or degradation of sensitive habitats and to adversely affect special-status terrestrial species (special-status plants, valley elderberry longhorn beetle, giant garter snake, northwestern pond turtle, Swainson's hawk, burrowing owl and other special-status birds, and vernal pool fairy shrimp). Potential impacts of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative related to wildlife would be associated with vegetation removal needed to clear the path for the Phase 4a Project and construction disturbances to wildlife and their habitats, as well as permanent loss of habitat for the affected species. These impacts could contribute to species declines and losses of habitat that have led to the need to protect these species under the Federal ESA and CESA.

Proposed Natomas Central Mutual Water Company (NCMWC) projects, including the Sankey Diversion and Fish Screen Project, would also result in habitat and wildlife disturbances during construction. The Sankey Diversion would include permanent loss of habitat for some special-status species, including giant garter snake, but an appropriate habitat replacement and management plan is being developed in consultation with USFWS and the California Department of Fish and Game (DFG) to provide adequate compensation for the loss. Despite temporary construction-related adverse impacts from the Fish Screen Project, the overall long-term impacts would be beneficial and habitat quality would improve.

The Airport Master Plan includes a number of components that are anticipated to result in adverse impacts on sensitive habitats and special-status species. The majority of these impacts would be associated with Phases 2 and 3 of the Airport Master Plan, which would not commence until 2014, and would include a combination of permanent habitat loss and construction-related impacts. There could also be impacts from expanded long-term operation of the Airport. SCAS has identified some habitat enhancement and protection measures that would be implemented to compensate for adverse impacts, and additional measures are anticipated to be identified as subsequent NEPA/CEQA evaluation and regulatory permitting is completed.

Significant adverse impacts on special-status species and sensitive habitats would be associated with the extensive future urban growth expected to occur in the Natomas Basin. This growth would continue to reduce the amount of habitat available to support special-status species. Potential adverse impacts from future approved expansion within the Basin have been addressed through the development of the NBHCP, and successful implementation of the NBHCP would ensure that there is no overall adverse impact on special-status species from implementation of these projects. Similarly, an HCP is being implemented for the Metro Air Park Project. Additional urban expansion is being promoted through the Joint Vision, which would result in development and open space

conservation within the Sacramento County portion of the Natomas Basin that was not covered in the NBHCP. Potential impacts on biological resources from implementation of this potential future development are at various stages of evaluation. Projects would be required to incorporate adequate impact avoidance and minimization measures and permanent habitat conservation to mitigate and compensate for the anticipated adverse impacts.

The Phase 4b Project impact conclusions on terrestrial biological resources differ between the two action alternatives, and accordingly are described separately below.

Adjacent Levee Alternative (Proposed Action)

Implementation of the Adjacent Levee Alternative (Proposed Action) and mitigation measures in Section 4.7, "Biological Resources," would ensure that the project's impacts are reduced or avoided in accordance with the requirements of the Federal ESA and CESA and other regulatory programs that protect habitats, such as Section 404 of the Clean Water Act and Section 1602 of the California Fish and Game Code. As discussed in Chapter 2, "Alternatives," the Phase 4b Project incorporates habitat creation, modification, and preservation components designed to offset the project's adverse impacts. In addition, mitigation measures require further development of these habitat improvement components, including preparation and approval of management plans. Successful implementation of these mitigation measures would result in permanent protection and management of giant garter snake habitat, including creation and enhancement of connectivity between giant garter snake populations in the Natomas Basin, which is expected to result in an overall improvement of conditions for giant garter snakes in the Basin. An increase in permanently protected foraging habitat for Swainson's hawk, eventual long-term increase in potential nesting habitat, and preservation of existing nest sites would also maintain or improve current conditions for this species in the Natomas Basin. Moreover, the Adjacent Levee Alternative (Proposed Action) has been designed to support achievement of the goals and objectives of the NBHCP, and implementation of Mitigation Measure 4.7-k would ensure that the Adjacent Levee Alternative (Proposed Action) does not jeopardize successful implementation of the NBHCP.

In summary, the Adjacent Levee Alternative (Proposed Action) would include minimization, avoidance, and compensation measures in accordance with the requirements of ESA, CESA, and other relevant regulatory requirements, as well as additional habitat protection and enhancement components. Therefore, the Adjacent Levee Alternative (Proposed Action) **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Fix-in-Place Alternative

Because of its inclusion of erosion control improvements at five sites along the Sacramento River east levee in Reaches B:10–11B, and to comply with USACE encroachment guidance, the Fix-in-Place Alternative would involve a somewhat different set of impacts to terrestrial biological resources than would the Adjacent Levee Alternative (Proposed Action). The narrower landside levee footprint of the Fix-in-Place Alternative would avoid some losses of woodland and grassland habitat that would be unavoidable under the Adjacent Levee Alternative (Proposed Action); however, under the Fix-in-Place Alternative, as much as 21acres of riparian woodland on the waterside of the levee in Reaches B:10–15 of the Sacramento River east levee could be removed to conform with USACE guidance regarding levee encroachments. In addition to its overall value as habitat for various species, this woodland supports active Swainson's hawk nests, elderberry shrubs, and other important biological resources. Adverse impacts on these resources on the waterside of the levee would be more difficult to mitigate than the adverse impacts from the adjacent levee footprint on the landside of the levee under the Adjacent Levee Alternative (Proposed Action), both in terms of the acreage of habitat lost and the quality of that habitat. Implementation of this alternative would include minimization, avoidance, and compensation measures in accordance with the requirements of ESA, CESA, and other relevant regulatory requirements; however, it is uncertain whether adequate compensation could be developed for the extensive loss of mature waterside vegetation under this alternative. Therefore, the Fix-in-Place Alternative **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact related to the extensive loss of

mature waterside riparian woodland that supports active Swainson's hawk nests, elderberry shrubs, and other important biological resources.

5.1.5.9 CULTURAL RESOURCES

Phase 1–4a Projects

Prehistoric human habitation sites are common in riverbank and floodplain areas, and burial sites are often encountered in the course of ground-disturbing activities. It is likely that known or unknown archaeological resources could be disturbed and cultural resources damaged or destroyed during construction activities for the Phase 1–4a Projects. Losses of a unique archaeological resource could occur where excavations encounter archaeological deposits that cannot be removed or recovered (e.g., under levees), or where recovery would not be sufficient to prevent the loss of significance of the cultural materials. Historic resources could also be damaged or require removal from areas near flood damage reduction facilities under the Phase 1–4a Projects. If these resources would be eligible for National Register of Historic Places (NRHP) listing, their modification or destruction would be considered significant. Although mitigation would be implemented to reduce effects on potentially significant cultural resources, adverse effects, particularly on archaeological resources, may still occur. Losses of archaeological resources would add to a historical trend in the loss of these resources as artifacts of cultural significance and as objects of research importance. For these reasons, despite the implementation of mitigation measures, USACE and SAFCA determined that the Phase 1–4a Projects **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on archaeological resources, including loss of these resources as artifacts of cultural significance and as objects of research importance.

Phase 4b Project

Construction of the Phase 4b Project could disturb known or unknown archaeological resources, and damage or destroy cultural resources. A number of historic and prehistoric sites are known to be located within the Phase 4b Project area. Cultural resources could also be damaged or require removal from areas near flood damage reduction facilities. USACE and the State Historic Preservation Officer (SHPO) have concurred that most historic-era resources identified in the Phase 4b Project footprint lack significance that might make them eligible for listing on the NRHP or the California Register of Historic Resources; however, no consultation has been enacted on prehistoric sites within the Phase 4b Project area. Given the number of eligible prehistoric sites in the Phase 1–4a Project areas, it is likely that additional unknown eligible properties, including burial remains, are located in the Phase 4b Project area. Although mitigation would be implemented to reduce impacts on potentially significant cultural resources, adverse impacts, particularly on prehistoric archaeological resources, may still occur. Losses of archaeological resources would add to a historical trend in the loss of these resources as artifacts of cultural significance and as objects of research importance. For these reasons, despite the implementation of Mitigation Measures 4.8-b, 4.8-c, and 4.8-d, the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on archaeological resources, including loss of these resources as artifacts of cultural significance and as objects of research importance.

5.1.5.10 PALEONTOLOGICAL RESOURCES

Phase 1–4a Projects

Earthmoving activities associated with the Phase 1–4a Projects could damage unknown unique paleontological resources, but potential damage would be limited by implementation of mitigation measures, and would be limited to individual resources in discrete locations. There is a low probability that any project (including the Phase 1–4a Projects and related projects) would encounter unique, scientifically-important fossils; if encountered,

there would be benefits that would occur from recovery and further study of those fossils. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

Under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, earthmoving activities could damage unknown unique paleontological resources, but potential damage would be limited by implementation of Mitigation Measure 4.9-a, and would be limited to individual resources in discrete locations. Because of the low probability that any project would encounter unique, scientifically-important fossils, and the benefits that would occur from recovery and further study of those fossils if encountered, development of the related projects and other development in the region are not considered to result in a cumulatively considerable impact related to paleontological resources. Therefore, the Phase 4b Project and related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.11 TRANSPORTATION AND CIRCULATION

Phase 1–4a Projects

Impacts of the Phase 1–4a Projects' construction activities on emergency access would be site-specific, intermittent, and temporary, and were not expected to be cumulatively considerable in previous environmental documents for these projects. Construction of the Phase 1–4a Projects would temporarily increase traffic levels on some local and regional roadways, but the majority of truck trips would take place off of public roads. There are no other related projects in the vicinity that are likely to compound the significant temporary traffic impacts of the Phase 1–4a Projects. Construction of the Phase 3 and Phase 4a Projects, however, are much more likely now to overlap in terms of use of borrow areas during the same construction season. Although the two project phases are expected to use different haul routes and may not add to each other's traffic loads on public roads, portions of these project phases could be constructed simultaneously, potentially compounding traffic levels and associated traffic hazards in some locations. Because of the increasing likelihood of compounding construction traffic levels, cumulatively significant traffic impacts could occur. Therefore, USACE and SAFCA have now determined that the Phase 1–4a Projects **could result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on transportation and circulation from increased truck traffic from overlapping Phase 3 and 4a Project construction activities.

Phase 4b Project

Impacts of the Phase 4b Project's construction activities on emergency access would be site-specific, intermittent, and temporary, and are not expected to be cumulatively considerable. Construction activities would temporarily increase traffic levels on some local and regional roadways, but the majority of haul truck trips would take place off of public roads. Temporary traffic increases associated with the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative—in addition a portion of the Phase 4a Project construction (Reach B:13–15) taking place in 2012—would be limited to the roadways shown on **Plate 2-6**. Some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other's traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site. There are no other anticipated projects in the vicinity that are likely to compound the significant temporary traffic impacts of the project. Even though impacts would be temporary, short-term, and intermittent, cumulative traffic impacts could be significant if portions of the Phase 4a and 4b Projects are constructed in the same locations during the same time periods. Therefore, the Phase 4b Project **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on transportation and circulation from increased truck traffic from overlapping Phase 4a and 4b Project construction activities.

5.1.5.12 AIR QUALITY

Phase 1–4a Projects

The Phase 1–4a Projects and related future projects would contribute to air pollutant emissions in Sutter and Sacramento Counties and to the nonattainment status of the Feather River Air Quality Management District (FRAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD) for ozone and respirable particulate matter 10 micrometers or less (PM_{10}), primarily through construction emissions. Other medium- and large-sized reasonably foreseeable projects, such as the anticipated developments in the Natomas Basin, would similarly contribute substantially to air quality impacts. Given the large scale of development that is expected in the Natomas Basin alone, as well as the nonattainment status of the Sacramento Valley Air Basin for ozone and PM_{10}, cumulative construction-related air quality impacts are expected to be significant and unavoidable. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on air quality during project construction activities.

Phase 4b Project

Because the materials quantities, truck trips required to deliver those materials, and other construction activities are similar, the emissions of criteria pollutants under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative are also similar. With implementation of mitigation measures, construction of the Phase 4b Project would result in less-than-significant temporary and short-term construction-related air quality impacts associated with generation of oxides of nitrogen (NO_X), PM_{10}, and volatile organic compounds (VOC). However, other medium-sized and large reasonably foreseeable projects, such as the anticipated developments in the Natomas area, would contribute substantially to air quality impacts. Given the large scale of development that is expected in the Natomas Basin alone, as well as the nonattainment status of the Sacramento Valley Air Basin for ozone and PM_{10}, cumulative construction-related air quality impacts are expected to be significant and unavoidable. For these reasons, the Phase 4b Project **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on air quality associated with generation of NO_X, PM_{10} (including $PM_{2.5}$), and VOC during construction.

5.1.5.12 CLIMATE CHANGE

Phase 1–4a Projects

In comparison to criteria air pollutants, such as ozone and PM_{10}, carbon dioxide (CO_2) emissions persist in the atmosphere for a much longer period of time. Greenhouse gas (GHG) emissions generated by the Phase 1–4a Projects would predominantly be in the form of CO_2. Project construction would result in a net increase in emissions during the construction periods for the Phase 1–4a Projects, despite the implementation of mitigation measures. Because of the intensity and duration of construction activities, and the lack of available mitigation measures to abate GHG emissions from heavy-duty construction equipment exhaust and on-road hauling emissions, the project's construction emissions would be significant and unavoidable with respect to climate change. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on GHG emissions and climate change from heavy-duty construction equipment exhaust and on-road hauling emissions.

Phase 4b Project

Project construction would result in a net increase in GHG emissions over a period of 5 years (2012–2016). These emissions would predominantly be in the form of CO_2 generated by internal combustion engines in construction equipment, and would occur despite the implementation of mitigation measures designed to reduce emissions. As

diseussed below, the Phase 4b Projeet eonsists of levee improvements, canal relocations, habitat creation, and channel erosion site remediation, and would not produce a net increase in operational GHG emissions. An additional projeet contribution would be a short-term increase in the accumulation of CO_2 in the atmosphere caused by the short-term reduction in carbon stock contained in woodlands that would be removed as part of project eonstruction. Because impacts to woodlands would differ between the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, ehanges in carbon sequestration are modeled and reported for both alternatives. The emissions for both alternatives are summarized at the end of this section in.

Combustion Sources from Project Construction

Currently, the California Air Resources Board (ARB), FRAQMD, or SMAQMD have not identified a significance threshold for analyzing GHG emissions generated by a proposed project or developed a methodology for analyzing cumulative impacts related to global warming. Although the state of California has identified GHG reduction goals through adoption of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, the effect of GHG emissions as they relate to global climate change is inherently a cumulative impact issue. Although the emissions of one single project would not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulatively considerable eontribution to a significant cumulative impact with respect to global climate change. To meet AB 32 goals, California would need to generate less GHG emissions than current levels.

The primary objective of AB 32 is to reduce California's contribution to global warming by reducing California's total annual production of GHG emissions. The impact that GHG emissions have on global climate change does not depend on whether they were generated by stationary, mobile, or area sources or whether they were generated in one region or another. Thus, the net change in total GHG levels generated by a project or activity is the best metric for determining whether a project would contribute to global warming. In the case of the action alternatives, if the size of the increase in emissions from the project is considered to be substantial, then the impact of the project would be cumulatively considerable.

In comparison to criteria air pollutants, such as ozone and PM_{10}, CO_2 emissions persist in the atmosphere for a much longer period of time. GHG emissions generated by the Adjacent Levee Alternative (Proposed Action) and Fix-In-Place Alternative would predominantly be in the form of CO_2. Project construction would result in a net increase in emissions to occur over a period of 5 years (2012–2016), despite the implementation of Mitigation Measure 4.11-a. Although any increase in GHG emissions would add to the quantity of emissions that would contribute to global climate change, it is noteworthy that emissions associated with the Adjacent Levee Alternative (Proposed Action) occur over a finite period of time (5 years), as opposed to operational emissions, which would occur over the lifetime of a project. The project would have no net increase in operational GHG emissions. Nonetheless, because of the intensity and duration of construction activities, and the lack of available mitigation measures to abate GHG emissions from heavy-duty construction equipment exhaust and on-road hauling emissions, the project's construction emissions would make an incremental contribution to climate change.

Previous GHG analyses conducted for the Phase 2 EIR, Phase 2 EIS, and Phase 3 EIS and EIR, concluded that the project's contribution to cumulative GHG impacts would be considerable and would be a significant and unavoidable cumulative impact (see Sections 5.1.3.2 and 5.1.3.3, above). The quantification methodologies and threshold concepts from the California Air Pollution Control Officers Association (CAPCOA) in the CEQA & Climate Change document (CAPCOA 2008), from the California Office of Planning and Research (OPR) in the CEQA Guideline Amendments for Greenhouse Gas Emissions (OPR 2009), and from ARB in the recently adopted AB 32 Scoping Plan (ARB 2008a) and the Preliminary Draft Staff Proposal Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act (ARB 2008b), have allowed further refinement of the GHG analysis, which was implemented in the Phase 3

FEIS and Phase 4a EIS and EIR, as well as in this EIS/EIR. Using this guidance, it is possible to discuss the project's emissions of GHG in a larger context.

As calculated in **Appendix F** and shown in **Table 5-4**, cumulative mobile source emissions generated during construction of the Phase 4a and 4b Projects would generate approximately 25,000 metric tons of CO_2, with the highest annual emissions of approximately 13,700 metric tons occurring in 2012. It should be noted that GHG emissions reported for the 4a Project did not factor in the net gain in carbon sequestration that would occur from replacement of woodland lost to construction. Because woodland impacts would be mitigated under those project phases at a 2:1 to 3:1 ratio, these emissions estimates would likely be substantially lower than previously reported.

For most projects, no simple metric is available to determine if a single project would substantially increase or decrease overall GHG emission levels. To establish additional context in which to consider the order of magnitude of project-generated GHG emissions, it may be noted that facilities (i.e., stationary, continuous sources of GHG emissions) that generate greater than 25,000 metric tons CO_2/year are mandated to report GHG emissions to CARB pursuant to AB 32. In addition, a threshold of 10,000 metric tonnes CO_2/year was recommended by the Market Advisory Committee for inclusion in a GHG cap and trade system, a threshold of 10,000 metric tonnes CO_2e/year adopted by the South Coast Air Quality Management District for stationary/industrial projects, and a draft preliminary threshold of 7,000 metric tons of CO_2e/year for industrial projects by ARB.

For the purpose of evaluating impacts on climate change from the Phase 4b Project's construction activities, absent any agency-adopted threshold for GHG emissions, it is notable that, even in the peak year of construction (2012), the 13,700 metric tons that would be generated by the Adjacent Levee Alternative (Proposed Action) would be substantially less than the 25,000 metric tons of CO_2/year AB 32 reporting targets. This information is presented for informational purposes, and it is not the intention of the project proponent(s) to adopt 25,000 metric tons CO_2/year as a numeric threshold. Rather, the intention is to put project-generated GHG emissions in the appropriate statewide context in order to evaluate the contribution to the global impact of climate change. SMAQMD has also recently released draft BMPs for consideration as practical alternatives to reduce construction-generated GHG emissions. As part of Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction," the project proponent(s) would implement a range of measures to reduce GHG emissions, which may include the following:

- improve fuel efficiency from construction equipment by reducing unnecessary idling (modify work practices, install auxiliary power for driver comfort); performing equipment maintenance (inspections, detect failures early, corrections); training equipment operators in proper use of equipment; use the proper size of equipment for the job; and using equipment with new technologies (re-powered engines, electric drive trains);
- use alternative fuels for generators at construction sites such as propane or solar, or use electrical power;
- encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes;
- reduce electricity use in the construction office by using compact fluorescent bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones;
- recycle or salvage non-hazardous construction and demolition debris (goal of at least 75% by weight);
- use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, and sidewalk and curb materials); and
- develop and implement a plan to efficiently use water for adequate dust control.

Table 5-4 provides total GHG emissions for each of the 5 years of construction activities, the total finite mass of GHG emissions for the entire Adjacent Levee Alternative (Proposed Action) by county, and compares the GHG emissions to the AB32 Minimum Standard for Reporting threshold.

Table 5-4
Summary of Modeled GHG Construction Emissions[1]

Phase 4b Project Construction Season[2]	Sutter County (tons)	Sacramento County (tons)	Total (tons)	Total (metric tons)
2012[3]	279.4	14,779.8	15,058.8	13,661.1
2013	-	3,671.2	3,671.2	3,330.5
2014	585.0	2,685.9	3,270.9	2,967.3
2015	167.5	2,879.4	3,046.9	2,764.1
2016	1,223.5	1,293.8	2,517.3	2,283.7
Total (tons)	**2,255.4**	**25,310.1**	**27,565.1**	-
Total (metric tons)	**2,046**	**22,960.9**	-	**25,006.7**

Notes: Construction emissions of CO_2 for the Fix-in-Place Alternative result in approximately 26,089 metric tons; components of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative are identical except for proposed work at the Sacramento River east levee.

[1] GHG emissions are modeled as carbon dioxide emissions resulting from combustion from operation of diesel-fueled construction emissions.

[2] See **Table 4.11-1** in Section 4.11, "Air Quality," for schedule and activity detail. Additional assumptions and detailed modeling results are presented in **Appendix F**.

[3] Includes Phase 4a Project components to occur within Sacramento County, including Sacramento River east levee Reaches B:13–15 and Riverside Canal.

Source: Data compiled by AECOM in 2010

Not included in the calculation of greenhouse gas emissions, but relevant to the adaption responses to climate change impacts, is that the Phase 4b Project is designed to accommodate changes in the amount, timing, and intensity of rain and storm events that would result from greenhouse warming.

Reduction in Sequestration of Atmospheric CO_2

Carbon Stock

Construction of the Phase 4b Project would involve removal of vegetation from the footprint of the proposed levee improvements. Tree brush removal, as well as mulching associated with disposal of this material, would cause some of the accumulated carbon in the woodland biomass ("carbon stock") to be released into the atmosphere. An estimate of the total biomass accumulation in trees and other vegetation within the project area has been performed to evaluate how much sequestered CO_2 and other GHG emissions would be released if the live trees, standing dead trees, or downed-woody debris are disposed.

Empirical data to support this analysis are limited because of the challenge of quantifying the wide variety of carbon cycling regimes present in forested landscape. Oak woodlands, for example, exhibit a wide variation in sequestration both spatially and temporally due to the regular occurrence of fire and re-growth, physiographic variety across the oak woodland biome, pests, grazing, or the potential changes to ecosystem structure associated with climate change. To identify sequestration rates for a particular site, measurements would need to be taken over a long time period (likely several years or more) and must consider infrequent events such as fire or pest

outbreaks, which occasionally release carbon.

The best available empirical data was used to estimate the potential range of sequestered carbon loss due to the removal of native woodlands from the project area. The Carbon On-line Estimator (COLE), developed by the United States Department of Agriculture (USDA), Forest Service, and the National Council for Air and Stream Improvements, Inc. (NCASI), uses the approved methodologies presented in the California Climate Action Registry's (CCAR) Forest Project Protocol (CCAR 2009). COLE was used to estimate the biological carbon stocks by vegetation type based on forest sample plots. For this analysis, COLE produced a carbon report with average forest carbon stocks by hectare for Sacramento, Sutter, Yuma, and Placer Counties based on the mean volume of carbon by forest type (species) (NCASI, Inc. 2007). These counties represent the region in which the Phase 4b Project is located, and provide an estimate for applicable forest carbon stocks. The results of the COLE carbon report are presented in **Table 5-5**.

Table 5-5
Estimated Carbon Stocks in Project Region[1]

Species	Mean Volume (m^3/hectare)	Live Tree	Dead Tree	Under-Story	Down Dead Wood	Forest Floor	Total Non-soil[2]
		Carbon (tons/hectare)					
Woodlands (Blue Oak)	74.9	43.4	0.4	6.6	3	31.4	84.8
California White Oak (Valley Oak)	49.5	25.3	0.9	4.5	1.3	25.5	57.5
Total	**124.4**	**68.7**	**1.3**	**11.1**	**4.3**	**56.9**	**142.3**

Notes: 1 Hectare = 2.47 acres

[1] Represents average carbon stocks for Sacramento, Sutter, Yuma, and Placer Counties.

[2] The total non-soil carbon (in tons per hectare) in **Table 5-5** is used to quantify the potential increase in atmospheric CO_2, as shown in **Table 5-7**. COLE guidelines identify carbon stock in soil as insignificant compared to non-soil, and therefore is not included in estimating the loss of carbon stock due to the proposed project.

Source: COLE 1605(b) Report for California, January 12, 2010 (NCASI: http://ncasi.uml.edu/, USDA Forest Service: http://www.fs.fed.us/ne/durham/4104)

As shown in **Table 5-5**, the quantity of carbon contained in a given hectare of forested area around the project area is estimated to be 142.3 tons. The Natomas Basin perimeter levee system encompasses approximately 21,448 hectares (or 53,000 acres). The Adjacent Levee Alternative (Proposed Action) would remove approximately 19.5 hectares (48 acres) of woodlands; the Fix-in-Place Alternative would remove approximately 26.7 hectares (66 acres) of woodlands. The proposed woodland removal and replacement for the Phase 4b Project are presented in **Table 5-6**.

Adjacent Levee Alternative's (Proposed Action's) Carbon Stock Impacts

Under the Adjacent Levee Alternative (Proposed Action), approximately 19.5 hectares (see **Table 4.7-2)** would be affected, resulting in a release of total potential carbon stock—through disposal of live trees, standing dead trees, or downed-woody debris—of approximately 2,775 tons or 2,517 metric tons. Smaller trees and vegetation, however, would be transplanted, preserving some of the carbon stock.

Table 5-6 Phase 4b Project Woodland Removal and Replacement			
	Landside (hectares)	Waterside (hectares)	Total (hectares)
Adjacent Levee Alternative (Proposed Action)			
Removal	14.6	4.9	19.5
Replacement	29.1	14.6	43.7
Fix-in-Place Alternative			
Removal	14.2	12.5	26.7
Replacement	28.3	37.6	65.9
Source: Data compiled by AECOM in 2010			

The Adjacent Levee Alternative (Proposed Action) would replace an estimated 43.7 hectares, or over two times the woodland area lost, through project design features and mitigation. Under Mitigation Measure 4.7-a, affected waterside woodlands would be replaced at a 1:1 ratio where vegetation is removed below the ordinary high water mark, and replaced at a 3:1 ratio where vegetation is removed above the ordinary high water mark.

As shown in **Table 5-7**, the total impact to carbon stock may result in a 3,124 metric tons carbon/year net benefit in the Phase 4b Project area under the Adjacent Levee Alternative (Proposed Action).

Table 5-7 Adjacent Levee Alternative's (Proposed Action's) Total Impact to Carbon Stock in the Project Area		
	Phase 4b Project Area (hectares)	Carbon Stock in the Project Area (metric tons carbon/year)
Carbon stock removal	19.5	(2,517)
Carbon stock replaced	43.7	5,641
Net impact	**24.2**	**3,124**
Note: Negative numbers shown in parenthesis. Source: Data compiled by AECOM in 2010		

Fix-In-Place Alternative's Carbon Stock Impacts

Under the Fix-in-Place Alternative, approximately 26.7 hectares of woodland would be removed (see **Table 4.7-2**), resulting in release of carbon stock—through disposal of live trees, standing dead trees, and downed-woody debris—of 3,799 tons or 3,447 metric tons. Many of the smaller trees and vegetation that would be lost from implementation of the Fix-in-Place Alternative, however, would be transplanted so that some of the carbon stock would be preserved.

The Fix-in-Place Alternative would replace an estimated 65.9 hectares, or over two times the woodland area lost, through project design features and mitigation. Landside woodlands that would be lost to project construction would be replaced at a 2:1 ratio on a per-acre basis, as part of the habitat creation component of the Phase 4b Project. Under Mitigation Measure 4.7-a, affected waterside woodlands would be replaced at a 1:1 ratio where vegetation is removed below the ordinary high water mark, and replaced at a 3:1 ratio where vegetation is removed above the ordinary high water mark.

As shown in **Table 5-8**, the total impact to carbon stock may result in a 5,060 metric tons carbon/year net benefit in the project area under the Fix-in-Place Alternative.

Table 5-8
Fix-in-Place alternative's Total Impact to Carbon Stock in the Project Area

	Phase 4b Project Area (hectares)	Carbon Stock in the Project Area (metric tons carbon/year)
Carbon stock removal	26.7	(3,447)
Carbon stock replaced	65.9	8,507
Net impact	**39.2**	**5,060**

Note: Negative numbers shown in parenthesis.
Source: Data compiled by AECOM in 2010

Carbon Sequestration

The process of carbon sequestration would decrease, and in some cases be eliminated, through the removal of trees and other vegetation as a result of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative. Many of the trees and vegetation that would be lost as a result of implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alterative would be transplanted so as to continue the sequestration process as well as releasing minimal amounts of CO_2. Those that are not transplanted would be removed from the site and processed for mulching and groundcover. Burning of the biomass would not occur. An estimate of the potential carbon sequestration loss has been performed to evaluate the CEQA question of how much potential CO_2 sequestration would be lost as a result of project impacts to live native tress (including roots) 3 inches or greater in diameter at breast height (dbh).

The USDA Forest Service defines carbon sequestration as "the process by which atmospheric carbon dioxide is absorbed by trees [plants] through photosynthesis and stored as carbon in biomass and soils (NCASI, Inc., 2007)." Sequestration rates for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative (oak woodlands) were drawn from Baldacci et al. in units of metric tons per hectare per year (i.e., a continuous process).

Adjacent Levee Alternative's (Proposed Action's) Carbon Sequestration Impacts

The total hectares for the Adjacent Levee Alternative (Proposed Action) are based on information collected for the evaluation of biological resources (see **Table 4.7-1**). **Table 5-9** lists the sequestration rate assumptions and total annual sequestration calculations for the Adjacent Levee Alternative (Proposed Action).

Table 5-9
Annual Carbon Sequestration Calculations for the Adjacent Levee Alternative (Proposed Action)

	Phase 4b Project (hectares)	Sequestration Rate[1] (metric tons carbon/ha/year)	Total Annual Sequestration (metric tons carbon/year)
Landside woodland	14.6	1.50	21.9
Waterside riparian woodland	4.9	1.50	7.35
Total	**19.5**	-	**30.0**

[1] From Baldacci et al.
Source: Data compiled by AECOM in 2010

Quantification of the long-term annual impact of the Adjacent Levee Alternative (Proposed Action) on carbon sequestration is based on the removal of existing biomass (sequestration loss) and any planned replacement through created land cover (sequestration gain), as discussed above. **Table 5-10** quantifies the annual carbon sequestration (loss versus gain) from changes in woodland cover under the Adjacent Levee Alternative (Proposed Action).

Table 5-10
Adjacent Levee Alternative's (Proposed Action's) Total Annual Sequestration for the Project Area – Existing Land Cover versus Created/Re-established Land Cover

	Phase 4b Project (hectares)	Annual Sequestration in the Project Area (metric tons carbon/year)[1]
Tree removal (sequestration loss)	19.5	30.0
Created land cover (sequestration gain)	43.7	65.5
Net impact	**24.2**	**35.5**

[1] Sequestration calculated as the sequestration rate of 1.5 metric tons carbon/ha/year multiplied by the number of hectares.
Source: Data compiled by AECOM in 2010

As shown in **Table 5-10**, the net change in annual carbon sequestration in the project area is an estimated benefit of 35.5 metric tons of carbon per year for the Adjacent Levee Alternative (Proposed Action).

Fix-in-Place Alternative's Carbon Sequestration Impacts

The total hectares for the Fix-in-Place Alternative are based on information collected for the evaluation of biological resources (see **Table 4.7-1**). **Table 5-11** lists the sequestration rate assumptions and total annual sequestration calculations for the Fix-in-Place Alternative.

Table 5-11
Annual Carbon Sequestration Calculations for the Fix-in-Place Alternative

	Phase 4b Project (hectares)	Sequestration Rate[1] (metric tons carbon/ha/year)	Total Annual Sequestration (metric tons carbon/year)
Landside woodland	14.2	1.50	21.3
Waterside riparian woodland	12.5	1.50	18.8
Total	**26.7**	-	**40.0**

[1] From Baldacci et al.
Source: Data compiled by AECOM in 2010

Quantification of the long-term annual impact of the Fix-in-Place Alternative on carbon sequestration is based on the removal of existing biomass (sequestration loss) and any planned replacement through created land cover (sequestration gain), as discussed above. **Table 5-12** quantifies the annual carbon sequestration (loss versus gain) from changes in woodland cover under the Fix-in-Place Alternative.

As shown in **Table 5-12**, the net change in annual carbon sequestration in the project area is an estimated benefit of 59 metric tons of carbon per year for the Fix-in-Place Alternative.

Table 5-12
Fix-In-Place alternative's Total Annual Sequestration for the Project Area – Existing Land Cover versus Created/Re-established Land Cover

	Phase 4b Project (hectares)	Annual Sequestration at the Project Site (metric tons carbon/year)[1]
Tree removal (sequestration loss)	26.7	40.0
Created land cover (sequestration gain)	66.0	99.0
Net impact	**39.3**	**59.0**

1 Sequestration calculated as the sequestration rate of 1.5 metric tons carbon/ha/year multiplied by the number of hectares.
Source: Data compiled by AECOM in 2010

Adjacent Levee Alternative's (Proposed Action's) Total Carbon Impact

As a result of woodland replacement, the Adjacent Levee Alternative (Proposed Action) would provide a net benefit in carbon stock and sequestration of 3,159 metric tons of carbon or 11,595 metric tons of CO_2, as shown in **Table 5-13**. The majority of the carbon would come from carbon stock replacement provided through woodland creation as part of the Phase 4b Project and through implementation of mitigation measures. This is a conservative estimate because some portions of removed wood would be sequestered in the soil in the project area through mulching or could remain sequestered in wood products.

Table 5-13
Potential Biological Carbon Change Summary for the Adjacent Levee Alternative (Proposed Action)

Description	Sequestration Gain (metric tons carbon)	Sequestration Gain (metric tons CO_2)[1]	Notes
Potential gain of carbon stocks	3,124	11,465[2]	Gains in carbon stock could be greater than estimated due to sequestration in soils through burial or mulching, converted in wood products, or possibly used in biomass energy generation.
Potential gain of carbon sequestration	35.5	130	Sequestration gain may be lower than estimated depending on forest fire regime, climate change impacts to forest ecology, or decreases in sequestration with forest age.
Total potential decrease in atmospheric CO_2	**3,159**	11,595	

[1] Based on a conversion of 3.67 tons of CO_2 per ton of carbon.
[2] Assumes the entire carbon stock is converted to CO_2 in a single year.
Source: Data compiled by AECOM in 2010

Although the Adjacent Levee Alternative (Proposed Action) would result in a net benefit of carbon stocks and sequestration capacity, the Adjacent Levee Alternative (Proposed Action) would result in short-term impacts to woodland because of the decades of time required for forest restoration/re-growth to achieve the current woodland carbon stock and sequestration capacity. Based on reforestation assumptions, the estimated age class of the carbon stock (estimated at 142.3 tons of carbon per hectare) within the affected area is 60 years (NCASI 2010). Therefore, although the Adjacent Levee Alternative (Proposed Action) would result in long-term carbon stock and sequestration gain, the rate of return would take up to 60 years and would result in a short-term impact to existing carbon stock capacity and sequestration rates.

Fix-in-Place Alternative's Total Carbon Impact

As a result of woodland replacement, the Fix-in-Place Alternative would provide a net benefit in carbon stock and sequestration of 5,114 metric tons of carbon or 18,768 metric tons of CO_2, as presented in **Table 5-14**. The majority of the carbon would come from carbon stock replacement provided through project design features and mitigation measures. This is a conservative estimate because some portions of removed wood would be sequestered in the soil in the Fix-in-Place Alternative project area through mulching or could remain sequestered in wood products.

Table 5-14
Potential Biological Carbon Change Summary for the Fix-in-Place Alternative

Description	Sequestration Gain		Notes
	(metric tons carbon)	(metric tons CO_2)[1]	
Potential gain of carbon stocks	5,060	18,570[2]	Gains in carbon stock could be greater than estimated due to sequestration in soils throngh burial or mulching, converted in wood products, or possibly used in biomass energy generation.
Potential gain of carbon sequestration	54	198	Seqnestration gain may be lower than estimated depending on forest fire regime, climate change impacts to forest ecology, or decreases in sequestration with forest age.
Total potential decrease in atmospheric CO_2	**5,114**	18,768	

[1] Based on a conversion of 3.67 tons of CO_2 per ton of carbon.
[2] Assumes the entire carbon stock is converted to CO_2 in a single year.
Source: Data compiled by AECOM in 2010

Although the Fix-in-Place Alternative would result in a net benefit of carbon stocks and sequestration capacity, the Fix-in-Place Alternative would result in short-term impacts to woodland because of the decades of time required for forest restoration/re-growth to achieve the current woodland carbon stock and sequestration capacity. Based on reforestation assumptions, the estimated age class of the carbon stock (estimated at 142.3 tons of carbon per hectare) within the affected area is 60 years (NCASI 2010). Therefore, although the Fix-in-Place Alternative would result in long-term carbon stock and sequestration gain, the rate of return would take up to 60 years and would result in a short-term impact to existing carbon stock capacity and sequestration rates.

Climate Change Impact Summary

The net GHG emissions for both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative are shown in **Table 5-15**.

Table 5-15
Net GHG Emissions of the Phase 4b Project

Source	Adjacent Levee Alternative (Proposed Action) (metric tons)	Fix-in-Place Alternative (metric tons)
Total CO_2 construction emissions (2012–2016)	25,007	26,089
Decrease in atmospheric CO_2 from gain in sequestration	11,595	18,768
Net GHG emissions	13,412	7,329

Source: Data compiled by AECOM in 2010

The estimated GHG emissions of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would be temporary and short-term in nature and would be substantially reduced through a long-term gain in carbon sequestration. Because the net GHG emissions would be below the minimum standard for reporting requirements under AB 32 (25,000 metric tons CO_2/year), and because the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would implement a range of measures to reduce GHG emissions, the Phase 4b Project's GHG emissions **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on GHG emissions and global climate change.

5.1.5.13 Noise

Ambient noise levels in the Natomas Basin are generated by sources that include aircraft operations, truck traffic on area roadways, and agricultural activity.

Phase 1–4a Projects

Impacts of the Phase 1–4a Projects' construction activities on noise would be site-specific, intermittent, and temporary, and were not expected to be cumulatively considerable in previous environmental documents for these projects. Construction of the Phase 1–4a Projects would temporarily increase traffic levels on some local and regional roadways, but the majority of truck trips would take place off of public roads. There are no other related projects in the vicinity that are likely to compound the significant temporary traffic impacts of the Phase 1–4a Projects. Construction of the Phase 3 and Phase 4a Projects, however, are much more likely now to overlap in terms of use of borrow areas during the same construction season. Although the two project phases are expected to use different haul routes and may not add to each other's traffic loads on public roads, portions of these project phases could be constructed simultaneously, potentially compounding traffic levels, which in turn would increase noise levels in some locations.

Given the increasing likelihood of the scenario summarized above, the Phase 1–4a Projects would have a significant and unavoidable project-level impact on noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic. A substantial number of residences are located adjacent to the portions of the NEMDC (Phase 3 Project) and the Sacramento River east levee (Phase 4a Project), where cutoff walls would be installed 24 hours per day, 7 days per week at times. In some locations along the NCC and Sacramento River east levee, construction work could take place simultaneously as part of the Phase 1–4a Projects. If constructed in the same locations during the same time periods, the Phase 1–4a Projects have the potential to cumulatively affect noise levels at residences in these areas, including during noise-sensitive hours. No feasible mitigation measures are available. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact from increased construction-related noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction-related traffic.

Phase 4b Project

The Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would both have a significant and unavoidable project-level impact on noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic. A substantial number of residences are located adjacent to the Sacramento east levee where cutoff walls would be installed. Some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other's traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site, increasing noise levels in the vicinity of residents along these haul routes. In addition, construction in Sacramento River east levee Reach B:15 as part of the Phase 4a Project could occur simultaneously with construction in Reach A:16, further increasing noise levels from haul trucks and levee construction equipment for residents in the vicinity of this area of potentially overlapping construction. No

feasible mitigation measures are available. Under the Fix-in-Place Alternative, construction of levee improvements would also occur directly along the Sacramento River east levee at many locations adjacent to residences on the waterside of Garden Highway, and to a lesser extent, the landside of the levee. The combined effect of noise from simultaneous construction of erosion control improvements on the waterside and levee improvements on the landside would be amplified and would affect a small number of residences on Garden Highway in the vicinity of the erosion control site, causing a project-level significant impact. This specific impact, however, could be decreased by scheduling construction of the erosion control improvements to occur before or after the nearby levee improvement work. For these reasons, the Phase 4b Project **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact from increased construction-related noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic.

5.1.5.14 RECREATION

Phase 1–4a Projects

There are no public or private recreational facilities located within the Phase 4a Project area, and the project would not introduce new housing into the area that would create additional demand for recreational facilities. The Phase 1–3 Projects, however, would potentially disturb access to recreational facilities in the Natomas Basin during construction, temporarily degrade the quality of recreational experiences as a result of construction activity and noise, and potentially damage recreational facilities on and adjacent to the NEMDC (Ueda Parkway bicycle trail and Gardenland Park). Reconstruction and restoration of any damaged park facilities would be required, and coordination with the public and recreation agencies would ensure that any residual effects would be minimized. Because of the temporary nature of the construction impacts and the likelihood that any access restrictions or degradation of the quality of recreational experiences would last for less than one construction season in any location, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

Impacts of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative on recreational uses would be limited to potential temporary disturbance of access to facilities on the western, eastern, and southern perimeter of the Natomas Basin during construction; potential temporary degradation in the quality of recreational experiences as a result of construction activity and noise; and damage to recreational facilities on and adjacent to the Sacramento River east levee (Reach A:19A–20) and the NEMDC, including the Ueda Parkway Bike Trail, Shorebird Park, Costa Park Site, Natomas Oaks Preserve, Bannon Creek Preserve, and Niños Parkway. Because of the temporary nature of the construction impacts and the likelihood that any access restrictions or degradation of the quality of recreational experiences would last for less than one construction season in any location, these impacts are not considered substantial enough to make a cumulatively considerable incremental contribution to a significant cumulative impact. Reconstruction and restoration of damaged park facilities would be required (Mitigation Measure 4.15-a). Recreation impacts would occur on a temporary project-specific basis rather than a cumulative basis, and any such incidents would be isolated. Therefore, the Phase 4b Project and related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.15 VISUAL RESOURCES

Phase 1–4a Projects

The Phase 1–4a Projects would include the removal of trees, other vegetation, and structures from the landside and/or waterside of the Sacramento River east levee within the footprint of the adjacent setback levee and berms.

These projects also include the removal of some vegetation and structural encroachments from the waterside of the Sacramento River east levee as part of encroachment removal actions, and would include the removal of trees from areas along the waterside of the NCC south levee. SAFCA's proposed levee integrity program would also require the removal of vegetation and other features that currently add to the rural and riverine character of views in the area. These changes would contribute to the substantial degradation of scenic resources in the Natomas Basin that are expected to result from various development projects and expansion of Airport facilities, as the area's visual character changes from rural agricultural landscape to urban/suburban setting. The Phase 1–4a Projects include the establishment of a substantial acreage of woodland plantings around the Basin to offset the projects' significant effects on scenic resources (oak and other native trees). The plantings, however, would require several years to become well established and several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed, which in some cases such as Heritage oaks is likely 100 years old or older. Additionally, the Levee Raise-in-Place (Phase 3 Project) and RSLIP (Phase 4a Project) Alternatives would result in the loss of high-aesthetic-value woodlands along the waterside of the levee.

Furthermore, the construction of an adjacent setback levee along the Sacramento River east levee in Reaches C:1 to B:13 would reduce views for motorists and other viewers along Garden Highway of the Natomas Basin and Central Valley. Generally, the height of the new adjacent setback levee would be 1–3 feet higher in elevation than the waterside hinge point of the existing Garden Highway, with the greatest elevations starting in the north and declining toward the south. However, the levee would be an additional 2–4 feet higher in up to 15 locations to accommodate other project features, such as pipeline crossings and roadway intersections. For example, where Sankey Road intersects Garden Highway in Reach C:1, the adjacent levee, which was constructed in 2009 as part of the Phase 2 Project, is an additional 3–4 feet higher for a length of approximately 40 feet, with 100–150-foot-long transitions on both sides back to the typical adjacent levee profile. These raised levee sections would further decrease views of the Basin from the Garden Highway, although their relatively short length and the fact that they would be widely spaced over 12 miles of highway would tend to minimize the effect somewhat. For these reasons, USACE determined that the Phase 1–4a Projects **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on visual resources, primarily from removal of vegetation (mature oak and other native trees) and the long time period for replanted vegetation to reach similar sizes.

Phase 4b Project

The Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would involve nighttime construction lighting that would be clearly visible from nearby residences. Nighttime lighting related to 24/7 construction of cutoff walls along the PGCC and NEMDC and potentially in Sacramento River east levee Reach A:16–19A (west of the I-80 overcrossing) in particular could create a new source of substantial light or glare that would adversely affect nighttime views in the area. In addition, nighttime lighting would also be used for drilling and testing of groundwater replacements wells. Construction-related nighttime lighting, however, would be localized and temporary and there are no other projects in the area that would contribute to a cumulative increase in light and glare. Therefore, the Phase 4b Project **would *not* result in a cumulatively considerable incremental contribution** to a significant cumulative impact.

For the Phase 4b Project, the Adjacent Levee Alternative (Proposed Action) would include the removal of trees, including Heritage oaks, other vegetation, and structures from the landside of the Sacramento River east levee within the footprint of the adjacent levee and berms, and may include the removal of some vegetation from the waterside of the Sacramento River east levee. These changes would contribute to the substantial degradation of scenic resources in the Natomas Basin that are expected to result with various development projects and expansion of Airport facilities, as the area's visual character changes from rural agricultural landscape to urban/suburban setting. Although the Phase 4b Project includes the establishment of a substantial acreage of woodland plantings around the Basin to offset the significant effect of the project on scenic resources (oak and other native trees), the plantings would require decades to become well established and up to 100 years to replace

Heritage oaks. Furthermore, construction of an adjacent levee, in combination with removal of woodlands along the landside of the Sacramento River east levee would substantially alter the existing visual character of the Natomas Basin and surrounding areas. Not only would the setback levee result in a physical barrier to the existing viewshed in some locations, tree removal would degrade the visual coherence of the project area.

The Fix-in-Place Alternative would result in similar impacts to visual resources as the Adjacent Levee Alternative (Proposed Action) except that the Sacramento River east levee would be widened in place, requiring greater removal of riparian woodlands on the waterside of these levee reaches to conform with USACE guidance regarding levee encroachments. Therefore, the Fix-in-Place Alternative would result in the loss of high-aesthetic-value woodlands along the waterside of the levee. Widening of the existing levee would add an additional obstruction of views toward the east, although less than under the Adjacent Levee Alternative (Proposed Action).

Because the replacement plantings that are part of the Phase 4b Project would be planted along the landside of the levee, and mitigation is not available to fully compensate for the loss of waterside vegetation (including SRA habitat), the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative **would result in a cumulatively considerable incremental contribution** to a cumulatively significant impact on visual resources, primarily from removal of vegetation (mature oak and other native trees) and the long time period for replanted vegetation to reach similar sizes.

5.1.5.16 Utilities and Service Systems

Phase 1–4a Projects

Construction of the Phase 1–4a Projects may damage irrigation systems and public utility infrastructure, resulting in temporary disruptions to service. Coordination with irrigation system users, consultation with service providers, and implementation of appropriate protection measures would minimize the possibility of any significant effects. Because utility and service system impacts would be isolated, temporary, and fully mitigated on a project-by-project basis, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

Construction of the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) may damage irrigation systems and public utility infrastructure, resulting in temporary disruptions to service. Coordination with irrigation system users, consultation with service providers, and implementation of Mitigation Measures 4.14-a and 4.14-b would minimize the possibility that any significant effect would occur. Because utility and service system impacts would be isolated, temporary, and fully mitigated on a project-by-project basis, the Phase 4b Project **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.17 Hazards and Hazardous Materials

Phase 1–4a Projects

For the Phase 1–4a Projects, mitigation would be implemented to minimize the potential for exposure of people or the environment to hazardous materials encountered during construction activity. If hazardous materials are encountered, the impacts would be localized and would not be expected to combine with the impacts of related projects. Because hazards and hazardous materials impacts would occur on a project-specific basis rather than a cumulative basis, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

Mitigation would be implemented to minimize the Phase 4b Project's potential for exposure of people or the environment to hazardous materials encountered during construction activity (Mitigation Measure 4.15-b). If hazardous materials are encountered, impacts would be localized and would not be expected to combine with the impacts of other projects. Because hazards and hazardous materials impacts would occur on a project-specific basis rather than a cumulative basis, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative along with other related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.18 AIRPORT SAFETY

Phase 1–4a Projects

The potential for night lighting of project areas to affect aircraft operations is a function of the location of construction areas in relation to Airport Perimeter B and the runway approaches. Potential impacts of the Phase 1–4a Projects would be reduced through lighting restrictions and coordination with SCAS. The Phase 1–4a Projects' potential to increase the possibility of collisions between aircraft and wildlife is a result of the location of construction areas in relation to the Airport Perimeter B and the runway approaches, and broad changes to managed land cover types in or near Airport Perimeter B. There are no other known projects that would affect lands within Airport Perimeter B; therefore, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

The Phase 4b Project would include night lighting in areas that could affect aircraft operations, depending on the location of construction areas in relation to Airport Perimeter B and the runway approaches. Potential impacts would be reduced through lighting restrictions and coordination with SCAS. The Phase 4b Project could potentially increase the possibility of collisions between aircraft and wildlife due to the proposed broad changes to managed land cover types in or near the Airport Perimeter B. There are no other known projects that would affect lands within the Airport Perimeter B, therefore the Phase 4b Project and related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.1.5.19 WILDFIRE HAZARDS

Phase 1–4a Projects

For the Phase 1–4a Projects, mitigation would be implemented to minimize the potential for wildland fires. If a wildland fire outbreak occurs, the impacts would be localized and would not be expected to combine with the impacts of related projects. Wildfire hazard impacts would occur on a project-specific basis rather than a cumulative basis, and any such incidents would be isolated. Therefore, USACE and SAFCA determined that the Phase 1–4a Projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

Phase 4b Project

Mitigation would be implemented to minimize the Phase 4b Project's potential for wildland fires (Mitigation Measures 4.16-h). If a wildland fire outbreak occurs, the impacts would be localized and would not be expected to combine with the impacts of other projects. Because wildfire hazard impacts would occur on a project-specific basis rather than a cumulative basis, and any such incidents would be isolated, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative along with other related projects **would *not* result in a cumulatively considerable incremental contribution** to a cumulatively significant impact.

5.2 GROWTH INDUCEMENT

Both NEPA (40 CFR Sections 1508[a] and [b]) and CEQA (State CEQA Guidelines [CCR Section 15126.2(d)] require an examination of the direct and indirect impacts of the proposed project, including the potential of the project to induce growth leading to changes in land use patterns and population densities and related impacts on environmental resources. Specifically, CEQA states that the EIR shall:

> Discuss the ways in which the proposed project could foster economie or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing eommunity service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Direct growth inducement would result if a project involved construction of new housing. Indirect growth inducement would result, for instance, if implementing a project resulted in any of the following:

- substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises);
- substantial short-term employment opportunities (e.g., construction employment) that indirectly stimulates the need for additional housing and services to support the new temporary employment demand; and/or
- removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area).

Growth inducement itself is not an environmental effect, but it may foreseeably lead to changes in land use patterns and population densities and related impacts on environmental resources.

It is important to note that the project proponent(s) is not charged with the responsibility of weighing and balancing the benefits and burdens of growth in the Natomas Basin. Neither USACE nor SAFCA have authority to permit development in the Basin or to impose conditions on the development that is permitted. SAFCA is made up of five agencies, some of which have land use authority (City of Sacramento, Sacrameuto County, and Sutter County) and some of which do not (American River Flood Control District and Reclamation District 1000). However, SAFCA's authority extends only to regional flood control matters because SAFCA is a joint powers agency and is limited to exercising powers common to all of its constituent members.

Local land use decisions are within the jurisdiction of the cities and counties within the project area: the City of Sacramento and Sacramento and Sutter Counties. Each of these agencies has adopted a general plan consistent with state law. These general plans provide an overall framework for growth and development within the jurisdiction of each agency, including the project area. Within the Natomas Basin, as elsewhere, population growth and urban development are also influenced by local, regional, and national economic conditions.

Because the Phase 4b Project would not involve the construction of housing, it would not be directly growth-inducing. Construction activities would generate short-term employment, but it is anticipated that the construction jobs would be filled using the existing local employment pool and project implementation would not directly

result in a population increase. The Phase 4b Project would accommodate growth currently planned for undeveloped lands in the Natomas Basin. These lands have been identified in the general plans and additional planning policy documents of the City of Sacramento and Sacramento and Sutter Counties as the areas most suitable for urban growth.

The approximately 9,038-acre North Natomas Community Plan (NNCP) area is designated in the City of Sacramento's general plan as the city's major growth area for new housing and employment opportunities (City of Sacramento 2009b). In 2000, the estimated population of the North Natomas area of Sacramento County was 1,082 people occupying 416 housing units (SACOG 2001). At buildout (year 2016), the NNCP estimates a population of 66,495 in the NNCP area occupying approximately 9,038 acres (City of Sacramento 2009a). As of September 14, 2005, the City of Sacramento had approved 12,162 lots for development of residential, commercial, and industrial land uses; 10,801 building permits; 11,599 single-family residential special permits; and 6,003 multifamily residential special permits for this area (City of Sacramento 2009a). SACOG estimates there were 14,865 persons living in the NNCP area and 5,368 housing units in the area in 2005, and projects that 45,040 persons will occupy 17,230 housing units in the NCCP area in 2025 (SACOG 2005).

The environmental consequences of buildout of the NNCP were addressed in the 1986 NNCP EIR (certified by the Sacramento City Council in May 1986), as well as in the 1993 Supplement to the 1986 NNCP EIR. Development within the NNCP started in 1999. More than 9,000 acres of the NNCP area were historically used for agriculture. While other long-term consequences of NNCP buildout would be mitigated by measures incorporated into the individual NCCP area projects, including measures to ensure consisteney of development with the Natomas Basin Habitat Conservation Plan, loss of important farmland will remain a significant and unavoidable environmental impact of this growth. In addition, the 1986 NNCP EIR and the 1993 NNCP EIR Supplement found that the development of the NNCP area would itself have growth-inducing effects on the adjacent areas surrounding the NNCP area, likely leading to the conversion of additional agricultural land to urban uses (City of Sacramento 1993).

Another indicator of anticipated future growth of the Natomas area is the City/County North Natomas Joint Vision Plan (Joint Vision). The Joint Vision is a long-term agreement between the City and County of Sacramento to collaboratively manage growth and preservation of open space and habitat in the 10,000-acre portion of unincorporated Natomas in Sacramento County. The Joint Vision anticipates that a substantial portion of the Natomas area will become urbanized. Both jurisdictions determined that it would be mutually beneficial to cooperatively plan for the urbanization of the area in accordance with smart growth principles. Concepts for development include a mixture of residential densities, an industrial park, and open spaces throughout, particularly in the northern part of Natomas to separate development from the Sutter County boundary. To date, no land use plans have been adopted.

Finally, in addition to the NNCP and the Joint Vision, Sutter County voters in 2004 passed Measure M, an advisory measure intended to provide the Sutter County Board of Supervisors with an indication of public sentiment regarding the types and level of development in the 7,500-acre area of the South Sutter County Industrial/Commercial Reserve in the northern part of Natomas. The southern boundary of the Measure M area forms the Sutter/Sacramento county line. Measure M did not approve any specific development proposals, but provides guidance for future development in the form of the following parameters for the South Sutter area:

- at least 3,600 acres for commercial/industrial development;
- at least 1,000 acres for schools, parks, other public uses, and retail; and
- no more than 2,900 acres for residential development, with a population cap of 39,000.

Regional infrastructure planning reflects these growth plans. In December 2004, SACOG, representing the Counties of El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba and their 22 constituent cities, adopted the "Preferred Blueprint Scenario" to guide land use and transportation choices over the next 50 years as the region's population grows from its current population of 2 million to include more than 3.8 million people. The Blueprint

project was initiated in 2002 to study future land use patterns and their potential effects on the region's transportation system, air quality, housing, open space, and other resources.

The study found that continuing the recent practice of building large-lot, low-density housing would consume another 660 square miles of undeveloped land. Residents would face longer commutes, more vehicle trips, dirtier air, and a growing disconnect between where they live and where they work.

Through a series of Blueprint workshops at the neighborhood, city, county, and regional level, more than 5,000 residents, elected officials, business leaders, and environmental interests helped craft an alternative vision that integrates smart growth concepts such as higher-density, mixed-use developments and reinvestment in existing developed areas. The Preferred Blueprint Scenario assumes certain levels and locations of both "reinvestment" (i.e., additional development on already-built parcels) and greenfield development (i.e., large-scale development on vacant land), including development on the land in the Natomas area that would be protected by the Phase 4b Project (**Plate 2-5**). An analysis of this scenario showed that following smart growth principles would shorten future commute times, reduce traffic congestion, lessen dependence on automobiles, and provide for housing choices that more closely align with the needs of an aging population.

The Preferred Blueprint Scenario will become part of SACOG's long-range transportation plan for the six-county region. It also will serve as a framework to guide local government in growth and transportation planning through 2050.

Using the above information, combined with an evaluation of residual flood damage, USACE and SAFCA have concluded that there is substantial evidence that the NLIP as a whole would accommodate anticipated growth in the project area in a manner that would be consistent with adopted local and regional growth management plans and with an the state's emerging State Plan of Flood Control. The growth-inducing effects of the NBHCP were completely analyzed in the adopted and approved HCP EIR, which identified no growth-inducing effects associated with the creation and ongoing operation of the HCP (City of Sacramento 2002).

Based on the information presented above, there is substantial evidence that the Phase 4b Project would accommodate planned regional growth. Thus, the Phase 4b Project, while accommodating planned regional growth, is not growth inducing itself.

5.3 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

NEPA requires that an EIS include a discussion of the relationship between short-term uses of the environment and long-term productivity. Within the context of this EIS/EIR, "short-term" refers to the construction period, while "long-term" refers to the operational life of the project and beyond.

Project construction would result in short-term construction-related effects such as interference with local traffic and circulation, and increased air emissions, ambient noise levels, dust generation, and disturbance of wildlife. These effects would be temporary, occurring only during construction, and are not expected to alter the long-term productivity of the natural environment. Project implementation would also result in long-term effects, including permanent loss of farmland, changes in visual resources, and adverse effects on existing waters, wetlands, and woodland habitat.

Project implementation would also assist in the long-term productivity of the environment by improving the levee system that protects the Natomas Basin by reducing the Basin's overall flood risk. In addition, it would also preserve and improve, over the long term, important habitat upon which the Natomas Basin species of concern to USFWS and DFG depend, by increasing acreages, connectivity, and habitat quality of wetlands and other waters of the United States in the Basin.

These long-term beneficial effects of the Phase 4b Project would outweigh its potentially significant short-term impacts to the environment.

5.4 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

State CEQA Guidelines CCR Section 21100(b)(2)(A) provides that an EIR shall include a detailed statement setting forth "any significant effect on the environment that cannot be avoided if the project is implemented." Chapter 4, "Environmental Consequences and Mitigation Measures," provides a detailed analysis of all potentially significant, direct and indirect, environmental impacts of the Phase 4b Project, feasible mitigation measures that could reduce or avoid the project's significant impacts, and whether these mitigation measures would reduce these impacts to less-than-significant levels. The Phase 4b Project's significant cumulative impacts are discussed in Section 5.1, "Cumulative Impacts," above. If a specific impact cannot be reduced to a less-than-significant level, it is considered a significant and unavoidable impact.

The Adjacent Levee Alternative (Proposed Action) would have the following significant and unavoidable environmental impacts (direct, indirect, and/or cumulative), which are presented in the order they appear in Chapter 4, "Environmental Consequences and Mitigation Measures":

- conversion of Important Farmland to nonagricultural uses;
- conflicts with lands under Williamson Act[1] contracts;
- inconsistency with Airport Master Plan, Airport Comprehensive Land Use Plan, and Airport Wildlife Hazard Management Plans;
- inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act;
- potential to physically divide or disrupt an established community;
- loss of landside and waterside woodland and SRA habitats;
- disruption to and loss of existing wildlife corridors;
- impacts on Swainson's hawk and other special-status birds;
- potential damage or disturbance to known archaeological or architectural resources from ground-disturbance or other construction-related activities;
- potential damage to or destruction of previously unidentified or undiscovered cultural resources from ground-disturbance or other construction-related activities;
- potential discovery of human remains during construction;
- temporary and short-term increases in traffic on local roadways;
- temporary and short-term increases in traffic hazards on local roadways;
- generation of temporary and short-term construction noise;

[1] The California Land Conservation Act of 1965 is commonly known as the Williamson Act (California Government Code Section 51200 et seq.).

- temporary and short-term exposure of residents to increased traffic noise levels from truck hauling associated with borrow activity;
- effects related to the proposed Natomas Levee Class 1 Bike Trail Project (short-term: significant and unavoidable; long-term: less than significant [beneficial]);
- permanent disruption of recreational activities and facilities;
- alteration of scenic vistas, scenic resources, and existing visual character of the project area;
- new sources of light and glare that adversely affect views; and
- aircraft safety hazards resulting from project implementation.

Significant and unavoidable impacts associated with the Fix-in-Place Alternative would be the same as those for the Adjacent Levee Alternative (Proposed Action) with the following additional significant and unavoidable impacts:

- inconsistency with the Natomas Basin Habitat Conservation Plan;
- impacts on Successful Implementation of Habitat Conservation Plans; and
- temporary and short-term exposure of sensitive receptors to, or temporary and short-term generation of, excessive groundborne vibration.

Where feasible mitigation exists, it has been included to reduce these impacts; however, the mitigation would not be sufficient to reduce the impacts to a less-than-significant level.

5.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES AND ENERGY CONSERVATION

NEPA requires that an EIS include a discussion of the irreversible and irretrievable commitments of resources which may be involved should the project be implemented. Similarly, the State CEQA Guidelines require a discussion of the significant irreversible environmental changes that would be caused by the project should it be implemented.

The irreversible and irretrievable commitment of resources is the permanent loss of resources for future or alternative purposes. Irreversible and irretrievable resources are those that cannot be recovered or recycled, or those that are consumed or reduced to unrecoverable forms. Project implementation would result in the irreversible and irretrievable commitment of energy and material resources during project construction and maintenance, including the following:

- construction materials, including such resources as soil and rocks;
- land and water area committed to new/expanded project facilities; and
- energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that would be needed for project construction, operation, and maintenance.

The use of these nonrenewable resources is expected to account for only a small portion of the region's resources and would not affect the availability of these resources for other needs within the region. Construction activities would not result in inefficient use of energy or natural resources.

CEQA further requires consideration of potential energy impacts of a proposed project (California Public Resources Code Section 21100[b][3]). Appendix F of the State CEQA Guidelines outlines issues related to energy conservation, and includes potential project description considerations, types of impacts applicable to energy use, and potential mitigation measures to reduce wasteful, inefficient, and unnecessary consumption of energy. According to CEQA, the goal of energy conservation implies wise and efficient use of energy, which can be accomplished by reducing energy consumption (e.g., natural gas and oil) and increasing reliance on renewable energy sources.

Energy used during project construction and operation would be expended in the form of electricity, gasoline, and diesel fuel, which would be used primarily by construction equipment and haul trucks during project construction and operation and maintenance activities (e.g., levee patrolling and flood fighting). As a result, ROG, NO_X, and PM_{10} emissions associated with the use of fuels are directly related to energy consumption. While there are no significance thresholds available for analysis of energy consumption, as shown in Impact 4.11-a, "Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10}," and Impact 4.11-c, "Long-Term Changes in Emissions of ROG, NO_X, and PM_{10} Associated with Project Implementation," it is reasonable to conclude that energy use during construction would be considerable. Energy use for operations and maintenance activities would be similar compared to existing conditions. Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} during Construction," includes reducing traffic speeds to 15 miles per hour on unpaved roads, and ensuring that equipment is properly tuned and maintained before and during on-site operation. Energy would be used wisely and efficiently during project construction and operation because air quality impacts would be mitigated to the extent feasible. Furthermore, the selected construction contractors would use the best available engineering techniques, construction and design practices, and equipment operating procedures. Finally, borrow sites have been selected to be located as close to levee construction as is feasible, which would reduce haul truck trip distances and, therefore, fuel consumption.

As described throughout this EIS/EIR, without implementation of the Phase 4b Project, the risk of levee failure would remain high. While a precise quantification of environmental impacts associated with potential levee failure is not possible, there is a potential for a variety of significant environmental impacts (see **Table ES-1** for a summary of potential impacts). Levee failure and the resulting emergency and reconstruction efforts could expend more energy, overall, than construction of the Phase 4b Project. Thus, project implementation preempts potentially substantial future energy consumption, and is likely to result in long-term energy conservation.

6 COMPLIANCE WITH FEDERAL ENVIRONMENTAL LAWS AND REGULATIONS

This chapter summarizes the Federal environmental laws and regulations that apply to the Phase 4b Project, aside from NEPA, and describes the Phase 4b Project's compliance with those laws and regulations. USACE, as the project proponent would not only comply with the Federal environmental laws and regulations, but would comply with all state, regional, and local laws, regulations, and ordinances, which are described in the "Regulatory Setting," of each individual issue area in Chapter 3, "Affected Environment."

If SAFCA chooses to implement the Phase 4b Project without Federal participation, SAFCA would comply with all Federal, state, regional, and local laws, regulations, and ordinances, despite the fact that SAFCA is a joint-powers authority and is not subject to regional and local plans, policies, and ordinances.

Although the Federal laws and regulations described in this chapter apply to the NLIP, this chapter focuses on the status of compliance with the Federal environmental laws and regulations that pertain to the Phase 4b Project.

6.1 CLEAN WATER ACT (SECTION 404)

The U.S. Environmental Protection Agency (EPA) is the lead Federal agency responsible for water quality management. The Clean Water Act of 1972 (CWA) is the primary Federal law that governs and authorizes water-quality control activities by EPA as well as the states. Various elements of the CWA address water quality, as discussed below.

CWA Section 404 establishes a requirement for a project proponent to obtain a permit from USACE before engaging in any activity that involves discharge of dredged or fill material into "waters of the United States," including wetlands. Fill material means material placed in waters of the United States where the material has the effect of replacing any portion of a water of the United States with dry land, or changing the bottom elevation of any portion of a water of the United States. Examples of fill material include but are not limited to rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, and material used to create any structure or infrastructure in waters of the United States. Waters of the United States include navigable waters of the United States; interstate waters; all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce; tributaries to any of these waters; and wetlands that meet any of these criteria or that are adjacent to any of these waters. Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three criteria: hydrophytic vegetation, hydric soil, and wetland hydrology. In addition, under Section 404, jurisdictional wetlands must: be adjacent to traditional navigable waters; directly about relatively permanent waters; or have a significant nexus with a traditional navigable water.

Before USACE can issue a permit under CWA Section 404, it must determine that the project is in compliance with the CWA Section 404(b)(1) Guidelines. The Section 404(b)(1) Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 Code of Federal Regulations [CFR] Section 230.10[a]). To comply with this provision, the applicant is required to evaluate opportunities that would result in less adverse impact on the aquatic ecosystem. A permit cannot be issued for a project, therefore, in circumstances where a less environmentally damaging practicable alternative exists that would fulfill the project purpose. An alternative is practicable if it is available and capable of being done after cost, existing technology, and logistics are taken into consideration in light of the overall project purpose as determined by USACE. If it is

otherwise a practicable alternative, an area not presently owned by the project applicant(s) that could reasonably be obtained, used, expanded, or managed to fulfill the purpose of the proposed activity may be considered.

As described in Chapter 1, "Introduction and Statement of Purpose and Need," if Congress authorizes the Common Features GRR and Common Features/Natomas PACR, and USACE implements the Phase 4b Project (as is the preferred plan), a Section 404 permit would not be required because USACE would be the project proponent and USACE does not issue permits for USACE projects. However, if Congress does not provide authorization and SAFCA chooses to proceed with implementation of the Phase 4b Project without Federal participation, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require an individual permit from USACE under Section 404 of the CWA for the discharge of fill into waters of the United States, including wetlands. This EIS/EIR will be used to support USACE's decision whether to grant SAFCA an individual permit for the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative.

Appendix D3 contains the Section 404(b)(1) evaluation.

6.2 RIVERS AND HARBORS ACT OF 1899, AS AMENDED

6.2.1 SECTION 14

Under Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] Section 408), referred to as "Section 408," the Secretary of the Army, on the recommendation of the Chief of Engineers, may grant permission for the alteration of a Federal project levee by a non-Federal entity if the alteration is not injurious to the public interest and does not impair the usefulness of the project.

Similar to a Section 404 permit, if Congress authorizes the Common Features GRR and Common Features/Natomas PACR, and USACE implements the Phase 4b Project (as is the preferred plan), Section 408 permission would not be required because USACE would be the project proponent and USACE does not issue permits for USACE projects. However, if Congress does not provide authorization and SAFCA chooses to proceed with implementation of the Phase 4b Project without Federal participation, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require Section 408 permission. This EIS/EIR will be used to support USACE's decision whether to grant SAFCA permission for the Phase 4b Project pursuant to Section 408.

6.2.2 SECTION 10

Under Section 10 of the Rivers and Harbors Act of 1899, work in, over, or under navigable waters of the United States is regulated by USACE. Navigable waters of the United States are defined as those waters subject to the ebb and flow of the tide shoreward to the mean high-water mark and those that are currently used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. The jurisdiction of USACE under CWA overlaps and extends beyond the geographic scope of its jurisdiction under the Rivers and Harbors Act. USACE permitting authority under the Rivers and Harbors Act is not subject to EPA oversight or any other restrictions specific to the CWA, and, in some cases the Rivers and Harbors Act alone will apply to waters. A permit from USACE is required prior to any work in, over, or under navigable waters of the United States.

As part of the Phase 4b Project, modifications to Sacramento City Sump Pump 160 and Reclamation District (RD) 1000 Pumping Plants Nos. 1A and 1B involve raising and extending discharge pipes, replacing or modifying pumps and motors, and performing other seepage remediation, including relocation of the stations away from the levee to accommodate raising the discharge pipes. These Phase 4b Project elements would be subject to permission from USACE under Section 10.

Similar to a Section 404 permit and Section 408 permission, if Congress authorizes the Common Features GRR and Common Features/Natomas PACR, and USACE implements the Phase 4b Project (as is the preferred plan), a Section 10 permit would not be required because USACE would be the project proponent and USACE does not issue permits for USACE projects. However, if Congress does not provide authorization and SAFCA chooses to proceed with implementation of the Phase 4b Project without Federal participation, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require a Section 10 permit. This EIS/EIR will be used to support USACE's decision whether to grant SAFCA a Section 10 permit for the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative.

6.3 FISH AND WILDLIFE COORDINATION ACT OF 1934, AS AMENDED

The Fish and Wildlife Coordination Act (FWCA) ensures that fish and wildlife receive consideration equal to that of other project features for projects that are constructed, licensed, or permitted by Federal agencies. The FWCA requires that the views of the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the applicable state fish and wildlife agency (in this case, the California Department of Fish and Game [DFG]) be considered when impacts are evaluated and mitigation needs determined.

USACE is coordinating with USFWS, NMFS, and DFG to determine the effects of the Adjacent Levee Alternative (Proposed Action) on fish and wildlife in the project area. USFWS provided a FWCA report for the Phase 4b Project (see **Appendix D5**). USACE and SAFCA are providing USFWS, NMFS, and DFG with copies of this EIS/EIR for review and comment.

6.4 ENDANGERED SPECIES ACT OF 1973, AS AMENDED

Pursuant to the Federal Endangered Species Act (ESA), USFWS and NMFS have regulatory authority over Federally listed species. Under ESA, a permit to "take" a listed species is required for any Federal action that may harm an individual of that species. Take is defined under ESA Section 9 as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under Federal regulation, take is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. ESA Section 7 outlines procedures for Federal interagency cooperation to conserve Federally listed species and designated critical habitat. Section 7(a)(2) requires Federal agencies to consult with USFWS and/or NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species.

SAFCA held meetings to discuss project features with USFWS during the NLIP alternatives formulation and CEQA compliance process (see Section 7.3, "Coordination with Other Federal, State, and Local Agencies"). USACE and SAFCA subsequently held informal consultation meetings in January through September 2008 to clarify project details and discuss information needs for ESA permitting.

In October 2008, a programmatic Biological Opinion (BO) was issued by USFWS for the NLIP with incidental take authorization for the Phase 2 Project; an amended BO was issued in May 2009 and appendages were issued in September 2009 and May 2010. These are included in **Appendix D1**. A Biological Assessment (BA) for the Phase 4b Project has been submitted; it requests incidental take authorization and will be appended to the programmatic BO. USFWS issued a BO for the Phase 4b Project (see **Appendix D1**). NMFS is expected to issue a Letter of Concurrence of Determination of Not Likely to Adversely Affect for the Phase 4b Project.

USACE and SAFCA are providing USFWS and NMFS with copies of this EIS/EIR for review and comment.

6.5 MIGRATORY BIRD TREATY ACT OF 1918

The Migratory Bird Treaty Act (MBTA) implements a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird..." (16 USC Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

Compliance with the MBTA is being addressed through compliance with the ESA and the California Endangered Species Act (CESA). The Phase 4b Project incorporates mitigation measures that would help ensure that construction activities do not result in the take of migratory birds, as discussed in Section 4.7, "Biological Resources."

6.6 BALD AND GOLDEN EAGLE PROTECTION ACT OF 1940

The Bald and Golden Eagle Protection Act provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds.

The Phase 4b Project area does not contain bald eagle or golden eagle nesting habitat, and the Phase 4b Project would not result in the take of bald or golden eagles. The Phase 4b Project incorporates mitigation measures that would ensure that construction activities do not result in the take of any raptors, as discussed in Section 4.7, "Biological Resources."

6.7 CLEAN AIR ACT OF 1963, AS AMENDED

The Federal Clean Air Act (CAA) required EPA to establish national ambient air quality standards (NAAQS). EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}), fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP).

Under the CAA, the primary responsibility for planning for attainment and maintenance of the NAAQS rests with the state and local agencies. Accordingly, state and local air quality agencies are also designated as the primary permitting and enforcement authorities for most CAA requirements. During preparation of the Phase 2 EIR, the air management districts with jurisdiction over the project area, the Feather River Air Quality Management District (FRAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD), were given the opportunity to comment on the NLIP with regard to the scope and content of the Phase 2 EIR in relation to each agency's statutory responsibilities and regulatory oversight of the project. In addition, FRAQMD was consulted through several written and verbal exchanges regarding its air emissions regulations. SMAQMD provided written comments on the Phase 2 EIR, and revisions to the air quality information were incorporated into the Phase 2 Final EIR based on this input.

The air quality effects analysis and associated mitigation measures in this EIS/EIR are consistent with the approach that was used in the Phase 2 EIS and EIR, Phase 3 EIS and EIR, and Phase 4a EIS and EIR. However, it is important to note that, for the Phase 4a Project, a conformity determination was not required for CEQA compliance and thus was not addressed in the FEIR. Under NEPA, however, the requirement for a conformity

determination was triggered due to the magnitude of construction-related activities and their potential to overlap. Thus, a conformity determination was prepared for the Phase 4a Project. Mitigation Measure 4.11-a in this EIS/EIR directs the project proponent(s) to implement control measures recommended by FRAQMD and SMAQMD to minimize temporary emissions of reactive organic gases (ROG), oxides of nitrogen (NO_X), and PM_{10} during project construction, and comply with all applicable rules and regulations of FRAQMD and SMAQMD. As described under Impact 4.11-b, the Proposed Action (including implementation of proposed mitigation measures) would not exceed the EPA's General Conformity *de minimis* thresholds or hinder the attainment of air quality objectives in the local air basin with mitigation implementation.

USACE and SAFCA are providing FRAQMD and SMAQMD with copies of this EIS/EIR for review and comment.

6.8 NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800, as amended in 2004) require Federal agencies to consider the potential effects of their proposed undertakings on historic properties. Historic properties are cultural resources that are listed on, or are eligible for listing on, the National Register of Historic Places (NRHP) (36 CFR Section 800.16[l]). Undertakings include activities directly carried out, funded, or permitted by Federal agencies. Federal agencies must also allow the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the proposed undertaking and its potential effects on historic properties.

As noted in Section 2.8, "Cultural Resources," inventories of all Phase 4b Project features that involve ground-disturbing work in native soils, including borrow locations, are ongoing; USACE and SAFCA will also complete evaluations, findings of effect, and treatment of identified resources where required. The project incorporates treatment measures to protect resources listed on or eligible for listing on the NRHP, as discussed in Section 4.8, "Cultural Resources." Determinations of the specific mitigation measures to be implemented will be made by USACE and SAFCA in consultation with the SHPO as part of the determination and eligibility and effect process, as required by NHPA Section 106. Implementation of the selected mitigation measures will be ensured through the execution of a Programmatic Agreement (PA). Signatories to the PA are USACE, SAFCA, and the SHPO. The ACHP has been consulted and waived participation as a signatory to the PA.

The PA addresses the scope of the Area of Potential Effect (APE) and provides that the APE will be defined for each project phase. The APE for each phase will be submitted with the cultural resources inventory reports, and will be consulted upon by SHPO. If areas are added to the project development activities subsequent to the SHPO concurrence on the map of the APE for a specific phase, USACE and SAFCA will complete an inventory of historic properties within the expanded APE. If historic properties that would be adversely affected by the project are identified in cultural resources inventories, USACE and SAFCA will prepare a Historic Properties Treatment Plan (HPTP) for review and written approval by the SHPO for those specific properties. Areas of archaeological sensitivity will be monitored in accordance with the HPTPs. A final report documenting the results of work prepared under the HPTPs will be submitted to the SHPO. The PA provides for public notice and consultation with Native Americans and the public. The signed and executed PA is included in **Appendix E1**.

The regulations implementing Section 106 state that:

> Compliance with the procedures established by an approved programmatic agreement satisfies the agency's section 106 responsibilities for all individual undertakings of the program covered by the agreement until it expires or is terminated by the agency, the president of NCSHPO when a signatory, or the Council (36 CFR Section 800.14[b][2][iii]).

The regulations further clarify that execution of agreement documents under 36 CFR Section 800.6, *Resolution of Adverse Effects* (including programmatic agreements adopted under that section per 36 CFR Section 800.14[b][3]) evidence satisfaction of Section 106 (36 CFR Section 800.6[b][3]):

> A memorandum of agreement executed and implemented pursuant to this section evidences the agency official's compliance with section 106 and this part and shall govern the undertaking and all of its parts. The agency official shall ensure that the undertaking is carried out in accordance with the memorandum of agreement.

Thus, execution of the PA, which was prepared through the process provided in 36 CFR Section 800.6, evidences USACE's compliance with Section 106. This does not mean that technical management activities under the PA are complete; they in fact are ongoing, as described above.

Appendix E2 contains a number of documents that are part of the record demonstrating Section 106 compliance. These include the following:

- June 7, 2007, letter from SAFCA's project archaeologist to the Native American Heritage Commission (NAHC) requesting a list of Native American individuals and organizations to contact regarding the project;
- June 19, 2007, response letter from the NAHC to SAFCA's project archaeologist supplying a list of the requested individuals and organizations;
- June 21, 2007, letters from SAFCA's project archaeologist to Native American individuals and organizations soliciting concerns and any information about cultural resources in the project area;
- July 9, 2007, telephone record of conversation between SAFCA's project archaeologist and Rose Enos (referred to by the NAHC as "Miwok/Maidu") regarding Ms. Enos' general concern regarding avoidance of burial sites and request to be contacted if work is conducted on such sites;
- January 2008 letter (and enclosures) from USACE to the SHPO initiating Section 106 consultation;
- February 1, 2008, letter from USACE to the United Auburn Indian Community of Auburn regarding an invitation to participate as a concurring party in the PA (Note: this is an example of about 20 letters that were sent to tribal entities inviting them to participate in the PA);
- May 8, 2008, letter from Shingle Springs Rancheria to the SHPO, USACE, and SAFCA regarding comments on the Draft PA and a request for formal consultation;
- June 11, 2008, response letter from USACE to Shingle Springs Rancheria regarding May 8, 2008 letter;
- June 12, 2008, response letter from SAFCA to Shingle Springs Rancheria regarding May 8, 2008 letter and the June 4, 2008, meeting; and
- July 23, 2008, letter from SAFCA to the California Department of Water Resources (DWR) providing further agency and public notice of the PA, per Stipulation VI of the PA, Native American and Other Consultation and Public Notice. (Note: This is an example of letters that were sent to local municipalities, relevant state agencies, Native American individuals and organizations, and local preservation societies.)

While this record is not necessarily exhaustive, it documents the critical steps for Section 106 compliance completed by USACE.

6.9 AMERICAN INDIAN RELIGIOUS FREEDOM ACT

The American Indian Religious Freedom Act of 1978 is also applicable to Federal undertakings. This act established "the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions...including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites" (Public Law 95-431). Consultations with Native Americans to determine concerns regarding the Phase 4b Project are discussed in Section 7.2, "Native American Consultation."

6.10 WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act (16 USC Section 1271 et seq.) establishes a National Wild and Scenic Rivers System for the protection of rivers with important scenic, recreational, fish and wildlife, and other values. Rivers are classified as wild, scenic, or recreational. The act designates specific rivers for inclusion in the System and prescribes the methods and standards by which additional rivers may be added. The lower American River is included in the System and is designated as "Recreational."

The Phase 4b Project area includes a portion of the American River north levee, which is considered to be part of the Lower American River. Consistency of the Phase 4b Project with the Wild and Scenic Rivers Act is analyzed in Section 4.3, "Land Use, Socioeconomics, and Population and Housing." The Phase 4b Project's potential impacts to recreation uses of this portion of the river are discussed in Section 4.13, "Recreation." The values for which the Lower American River was included in the System would not be adversely affected by the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative.

6.11 EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

Executive Order (EO) 11988, Floodplain Management (May 24, 1977), directs Federal agencies to issue or amend existing regulations and procedures to ensure that the potential effects of any action it may take in a floodplain are evaluated and that its planning programs and budget requests reflect consideration of flood hazards and floodplain management. The purpose of this directive is "to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." Guidance for implementation of EO 11988 is provided in the floodplain management guidelines of the U.S. Water Resources Council (40 CFR Part 6030; February 10, 1978) and in *A Unified National Program for Floodplain Management*, prepared by the Federal Interagency Task Force on Floodplain Management (1982).

Recognizing that improving the Natomas Basin perimeter levee system would indirectly support population growth within the Basin, USACE in 1991 conducted extensive studies of the feasibility of constructing a cross-levee spanning the Basin from east to west to limit the extent of flood damage reduction improvements and associated floodplain development to the southern one-half to two-thirds of the Basin. The present study reconsidered a cross-levee measure. For the reasons described in Section 2.1.5, "Alternatives Considered, But Eliminated from Further Consideration," this flood damage reduction alternative has been determined to be impracticable and unlikely to prevent the urbanization of the northern portion of the Basin without a very costly program for acquiring flowage easements and retiring development rights on the lands north of the cross levee. Consequently, improvements to the Natomas Basin perimeter levee system have been determined by USACE, the State, and SAFCA to be the feasible method of providing adequate flood damage reduction to existing development within the Basin and to the planned development. Although improving the perimeter levee system would fail to discourage further development within the Basin, this action is consistent with efforts by the State of California to comprehensively address floodplain development and flood risk on a regional scale. This comprehensive approach differentiates between flood damage reduction requirements for urbanized and nonurbanized floodplain areas, and will direct urban development away from those floodplains where a 200-year

level of flood risk reduction (0.005 annual exceedance probability [AEP]) cannot be achieved, while ensuring that this level of flood damage reduction is provided for already heavily populated areas such as the Natomas Basin.

The Phase 4b Project would reduce the risk of flood damage and minimize the impact of floods on human health, safety, and welfare by strengthening existing flood damage reduction infrastructure (see Section 4.5, "Hydrology and Hydraulics," for a discussion of the methodology and analysis of the Phase 4b Project's potential flood-related impacts). As noted in Section 2.7, "Residual Risk of Flooding," implementation of the Phase 4b Project would substantially lessen the probability of a flood in the Basin due to levee failure; however, the Natomas Basin would remain subject to a residual risk of flooding under both of the action alternatives. USACE and SAFCA would be required to maintain an ongoing residual risk management program, as described in Section 2.7. The Phase 4b Project would also create natural habitat that would serve ecological functions associated with natural floodplains (see Section 2.3.4, "Habitat Creation"). Because there is no practicable, feasible alternative to the urban floodplain development indirectly associated with the project, USACE and SAFCA would maintain an ongoing residual risk management program and satisfy EO 11988, as described below.

In 1982, the Interagency Task Force on Floodplain Management published additional guidance on the implementation of EO 11988. Additional standards were developed to protect human safety, health, and welfare. These standards apply to "critical actions," which are defined by the Water Resources Council Floodplain Management Guidelines as "any activity for which even a slight chance of flooding would be too great. The critical action floodplain is defined as the 500-year floodplain."

To assist in determining whether a proposed action is a "critical action," the following questions must be answered. If any answer is in the affirmative, a proposed action is considered a "critical action" and, therefore, subject to a higher standard.

- If flooded, would the proposed action create an added dimension to the disaster, as could be the case for liquefied natural gas terminals and facilities producing and storing highly volatile, toxic, or water-reactive materials?

- Given the flood warning lead-time available, would the occupants of buildings such as hospitals, schools, and nursing homes be insufficiently mobile to avoid loss of life and injury?

- Would essential and irreplaceable records, utilities, and/or emergency services be lost or become inoperative if flooded? (Interagency Task Force on Floodplain Management 1982.)

The NLIP is a program of levee improvements; it would not place sensitive land uses (e.g., hazardous materials storage facilities, senior care facilities, hospitals, schools, etc.) within a floodplain. Further, as described in Section 5.2, "Growth Inducement," and elsewhere in this EIS/EIR, neither USACE nor SAFCA have any authority over what types of land uses would be placed in the Natomas Basin, with or without implementation of the NLIP. Therefore, USACE and SAFCA have concluded that the NLIP is not a "critical action."

Notwithstanding USACE's and SAFCA's determination that the NLIP is not a "critical action" pursuant to EO 11988, the following eight-step process was followed as directed in the Water Resources Council Floodplain Management Guidelines for implementation of EO 11988 (these procedures are excerpted from USACE's ER 1165-2-26). Responses follow in italics.

a) Determine if the proposed action is in the base flood plain.

Yes, the NLIP, of which the Phase 4b Project is a component, is a program of levee improvements in the Natomas Basin, which is in the 100-year floodplain.

b) 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 as outlined in paragraph 7 above.

See Chapter 2, "Alternatives," of this EIS/EIR. Also, see Appendix B1, "Alternatives Formulation and Screening Details."

c) 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 undertaken for the Phase 4b Project are described in Chapter 7, "Consultation and Coordination," of this EIS/EIR. NEPA- and CEQA-required notices have been mailed to affected property owners throughout the NLIP environmental review process, soliciting input on the content of the environmental documents and noticing various public meetings. Additionally, notices have also been posted in the largest local newspaper, The Sacramento Bee, *announcing various public meetings. USACE and SAFCA have also participated in numerous meetings and calls with affected property owners on an individual basis to discuss project-related concerns. Public comments received on the NOI/NOP are considered and addressed, where appropriate in the DEIS/DEIR; public comments received on the DEIS/DEIR are addressed in the FEIS/FEIR; and public comments received on the FEIS/FEIR will be addressed in the record of decision (ROD).*

d) 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 Phase 4b Project are identified in Chapter 4, "Environmental Consequences and Mitigation Measures," of this EIS/EIR. The Phase 4b Project also includes the creation of natural habitat that would serve ecological functions associated with natural floodplains (see Section 2.3.4, "Habitat Creation," of the EIS/EIR). As stated above, the Phase 4b Project would be located within the Natomas Basin; no project components would be located outside of the Natomas Basin, with the exception of the Triangle Properties Borrow Area, which is located outside of but directly adjacent to the Basin because of its proximity to the NCC, PGCC, and NEMDC.

e) 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, as outlined in paragraph 7, above.

See Chapter 5.2, "Growth Inducement," of this EIS/EIR. The NLIP, including the Phase 4b Project, while accommodating planned regional growth, is not growth-inducing itself.

f) 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 throughout this EIS/EIR and will be implemented as part of the Phase 4b Project to minimize the project's potentially adverse impacts (see Chapter 4, "Environmental Consequences and Mitigation Measures," of this EIS/EIR). As noted above, the Phase 4b Project includes the creation of natural habitat that would serve ecological functions associated with natural floodplains (see Section 2.3.4, "Habitat Creation," of this EIS/EIR). The No-Action Alternative is described in Section 2.2, "No-Action Alternative," of this EIS/EIR. Impacts of the No-Action Alternative are identified throughout Chapter 4, "Environmental Consequences and Mitigation Measures," of this EIS/EIR.

g) 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.

See response to Item c, above.

h) Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order stated in paragraph 6 above.

The objectives of the NLIP are to: (1) provide at least a 100-year level of flood risk reduction (0.01 AEP) to the Natomas Basin as quickly as possible, (2) provide 200-year flood risk reduction (0.005 AEP) to the Basin over time, and (3) avoid any substantial increase in expected annual damages as new development occurs in the Basin. The NLIP, including the Phase 4b 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 it would not induce development in the floodplain (objective a); would reduce the hazard and risk associated with floods (objective b) thereby minimizing the impacts of floods on human safety, health, and welfare (objective c); and would restore and preserve the natural and beneficial values of the base floodplain (objective d).

6.12 EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

The purpose of EO 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, EO 11990 requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. EO 11990 applies to: acquisition, management, and disposition of Federal lands and facilities construction and improvement projects which are undertaken, financed, or assisted by Federal agencies; and Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities. USACE and SAFCA have taken actions to minimize project effects on wetlands where feasible and to create new wetlands as part of the project.

Implementation of the Phase 4b Project as proposed would ensure no-net-loss of aquatic resource function and services through SAFCA's proposed compensatory mitigation, proposed in consultation and coordination with USACE. Wetlands and other waters of the United States that would be created as part of the project are described in Section 2.3.4, "Habitat Creation." Wetlands that would be created as part of the project include marsh habitat in a portion of the Fisherman's Lake Borrow Area after being reclaimed, for which USACE and SAFCA have developed a preliminary design.

6.13 EXECUTIVE ORDER 12898, FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

EO 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (59 Federal Register 7629 [1994]) requires Federal agencies to identify and address disproportionately high and adverse health or environmental effects on minority populations, low-income populations, and Native Americans that may result from any proposed action. The Council on Environmental Quality (CEQ) has oversight of the Federal government's compliance with the EO. To facilitate compliance, CEQ prepared and issued, in association with EPA, "Environmental Justice Guidance under the National Environmental Policy Act" (CEQ December 1997). The Environmental Justice Guidance provides six principles by which environmental justice issues should be identified and addressed (CEQ 1997:9):

1. Consider the composition of the affected area to determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by the proposed action, and if so, determine if human health or environmental affects would be disproportionately high on those populations.

2. Consider relevant public health data and industry data concerning the potential for multiple or cumulative exposure to human health or environmental hazards including historical patterns of exposure to hazards.

3. Recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the action.

4. Develop effective public participation strategies.

5. Assure meaningful community representation in the process.

6. See tribal representation in the process.

See Section 3.17 and 4.17, "Environmental Justice," for more information on project effects on minority and low-income populations, as well as on Native American tribes.

6.14 FARMLAND PROTECTION POLICY ACT

The Natural Resources Conservation Service (NRCS) is the agency primarily responsible for implementing the Federal Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize Federal contributions to the conversion of farmland to nonagricultural uses by ensuring that Federal programs are administered in a manner compatible with state government, local government, and private programs designed to protect farmland.

NRCS administers the FPPA, which is a voluntary program that provides funds to help purchase development rights to keep productive farmland in agricultural uses. The program provides matching funds to state, local, or tribal government entities and nongovernmental organizations with existing farmland protection programs to purchase conservation easements. Participating landowners agree not to convert the land to nonagricultural uses and retain all rights to the property for future agriculture. A minimum 30-year term is required for conservation easements, and priority is given to applications with perpetual easements. NRCS provides up to 50% of the fair market value of the easement (NRCS 2004).

Implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require converting areas of farmland along the Natomas Basin perimeter levee system to non-agricultural uses. Additional areas of farmland would be used as sources of soil borrow material. The topsoil on these lands would be retained and replaced after several feet of underlying soil is removed, and most of these lands would continue to be farmable, although some would be converted to marsh habitat. Mitigation intended to reduce project effects on farmland is included in this EIS/EIR. Also, the proposed modifications of the agricultural irrigation and drainage infrastructure included in the action alternatives would support the maintenance of agricultural practices on the west side of the Natomas Basin.

The project complies with the FPPA because it provides for mitigation of unavoidable direct conversion of agricultural land to nonagricultural uses, would provide infrastructure that would support the continuation of agricultural uses on the west side of the Natomas Basin, and is consistent with state and regional planning efforts that will protect farmland on a regional scale from development. Consultation with the NRCS (including submittal of the Farmland Conservation Impact Rating form) does not apply to Federal activities involving permitting and licensing (see 7 CFR Part 658) and therefore is not required for the project.

6.15 WILDLIFE HAZARDS ON OR NEAR AIRPORTS

The Federal Aviation Administration (FAA) addresses control of hazardous wildlife in Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* (FAA 2007). The FAA provides direction on where public-use airports should restrict land uses that have the potential to attract hazardous wildlife. FAA recommends a distance of 10,000 feet separating wildlife attractants and aircraft movement areas. The area within

a 10,000-foot radius of the Airport Operations Area is designated as the Airport Perimeter B. The FAA definition of wildlife attractants in AC 150/5200-33B includes human-made or natural areas, such as poorly drained areas, retention ponds, agricultural activities, and wetlands. AC 150/5200-33B recommends against the use of Airport property for agricultural production within a 5-mile radius of the Airport Operations Area unless the income from the agricultural crops is necessary for the economic viability of the Airport.

Section 2.3.4.6, "Aviation Safety Components," describes FAA's regulatory interest in managing wildlife attractants within 5 miles of the edge of the Airport's Area of Operations. Potential borrow sites within this area have been identified based on balancing multiple management priorities (including flood risk reduction, aviation safety, and habitat conservation) and minimizing the cost and environmental effects of borrow haulage activities. Within the Airport Perimeter B, management of the grasslands created by borrow operations would also be consistent with the Airport's *Wildlife Hazard Management Plan* (Sacramento County Airport System 2007).

6.16 OBSTRUCTIONS AND AIRPORT LAND USE COMPATIBILITY

Part 77 of the Federal Aviation Regulations (FAR), "Objects Affecting Navigable Airspace," has been adopted as a means of monitoring and protecting the airspace required for safe operation of aircraft and airports. Objects that exceed certain specified height limits constitute airspace obstructions. FAR Section 77.13 requires that the FAA be notified of proposed construction or alteration of certain objects within a specified vicinity of an airport, among them the following:

1. Any construction or alteration of more than 200 feet in height above the ground level at its site.

2. Any construction or alteration of greater height than an imaginary surface extending outward and upward at [a slope of] 100 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway of each [public-use airport, public-use airport under construction, or military airport] with a least one runway more than 3,200 feet in actual length, excluding heliports.

The FAA is serving as a cooperating agency under NEPA for the Phase 4b Project and is in regular communication with USACE and SAFCA regarding the project design and its potential effects on Airport property.

6.17 FEDERAL EMERGENCY MANAGEMENT AGENCY

6.17.1 LEVEE REQUIREMENTS

For a levee accredited by the Federal Emergency Management Agency (FEMA) as providing a 100-year level of flood risk reduction (0.01 AEP), the levee must be shown to satisfy several criteria, including protection of the embankment against erosion. Specific requirements are contained in 44 CFR Section 65.10.

6.17.2 FLOOD ZONE DESIGNATIONS

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. In January 2008, FEMA proposed remapping the Natomas Basin as an AE zone, with the designation to take effect in December 2008. FEMA defines AE zones as areas with a 1% annual chance of flooding. The designation would result in the requirement that the bottom floor of all new buildings be constructed at or above base flood elevation—as little as 3 feet in some areas of Natomas but up to 20 feet above the ground level in much of the Basin. It is therefore anticipated that this designation would effectively stop any projects that are not issued building permits by the time the new map takes effect. An alternative to this designation, the A99 zone, may be applied where it can be shown that an area with a 1% annual chance of flooding will be protected by a Federal flood damage reduction system where construction has reached

specified legal requirements. The main requirements are that 100% of the cost of the flood damage reduction system restoration project must be authorized, 60% must be appropriated, 50% must be expended, and "critical features" must be under construction and 50% completed (FEMA 2007). Construction is not constrained and there are no FEMA-specified building elevation requirements with an A99 designation. Mandatory flood insurance purchase requirements apply to both designations, however.

6.18 SUSTAINABLE FISHERIES ACT

In response to growing concern about the status of United States fisheries, Congress passed the Sustainable Fisheries Act of 1996 (Public Law [PL] 104-297) to amend the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265), the primary law governing marine fisheries management in the Federal waters of the United States. Under the Sustainable Fisheries Act, consultation is required by NMFS on any activity that might adversely affect essential fish habitat (EFH). EFH includes those habitats that fish rely on throughout their life cycles. It encompasses habitats necessary to allow sufficient production of commercially valuable aquatic species to support a long-term sustainable fishery and contribute to a healthy ecosystem. The Sacramento River and the lowermost segment of the NEMDC have been designated as EFH by the Pacific Fishery Management Council.

Phase 4b Project-related impacts to EFH in the Sacramento River are discussed in Section 4.7, "Biological Resources," and mitigation measures are identified (see Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats").

6.19 RESOURCE CONSERVATION AND RECOVERY ACT

The primary Federal agency regulating the generation, transport, and disposal of hazardous substances is EPA, under the authority of the Resource Conservation and Recovery Act (RCRA). RCRA established an all-encompassing Federal regulatory program for hazardous waste that is administered in California by the Department of Toxic Substances Control (DTSC). Under RCRA, DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments of 1984, which specifically prohibits the use of certain techniques for the disposal of various hazardous waste. The Federal Emergency Planning and Community Right-to-Know Act of 1986 imposes planning requirements to help protect local communities in the event of accidental release of an extremely hazardous substance.

Based on an extensive records search, one Cortese-listed site was identified within the Phase 4b Project construction footprint for Pumping Plant No. 8: the Olympian Oil site located at 4422 Northgate Boulevard (see **Plate 2-14**). Additionally, multiple sites were identified along the Sacramento River east levee with possible contamination issues. Other hazardous materials may exist within the Natomas Basin and/or may be brought in and used for project construction. The Phase 4b Project's potential impacts related to hazards and hazardous materials are described in Section 4.16, "Hazards and Hazardous Materials."

6.20 WORKER SAFETY REQUIREMENTS

The U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) is responsible at the Federal level for ensuring worker safety. OSHA sets Federal standards for implementation of workplace training, exposure limits, and safety procedures for the handling of hazardous substances (as well as other hazards). OSHA also establishes criteria by which each state can implement its own health and safety program.

Implementation of the Phase 4b Project would create numerous employment opportunities, some of which may involve the handling of toxic, harmful, or hazardous substance as well as other hazards. The Phase 4b Project's potential impacts related to exposure to hazardous materials are described under Impact 4.16-c in Section 4.16, "Hazards and Hazardous Materials."

6.21 UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT

All or portions of parcels within the Phase 4b Project footprint would need to be acquired for project construction. Federal, state, local government agencies, and others receiving Federal financial assistance for public programs and projects that require the acquisition of real property, must comply with the policies and provisions set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in 1987 (42 USC Section 4601 et seq.) (Uniform Act), and implementing regulation, 49 CFR Part 24. Relocation advisory services, moving costs reimbursement, replacement housing, and reimbursement for related expenses and rights of appeal are provided for in the Uniform Act.

Phase 4b Project implementation would require acquisition of property in the Phase 4b Project footprint to construct flood damage reduction facilities and improvements. Additionally, temporary relocation of residents may occur during portions of construction (i.e., during 24/7 construction near residences). Property acquisition and relocation services, compensation for living expenses for temporarily relocated residents, and negotiations regarding any compensation for temporary loss of business would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

6.22 FEDERAL EARTHQUAKE HAZARDS REDUCTION ACT

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to "reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program." To accomplish this, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives.

NEHRP's mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improvement of building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improvement of mitigation capacity; and accelerated application of research results. The NEHRPA designates FEMA as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and the U.S. Geological Survey.

The closest active fault to the Natomas Basin is located approximately 15 miles to the northwest, as shown in **Table 3.4-1**. Because there are no active faults within or near the Phase 4b Project footprint, the risk of fault ground rupture is low. In addition, geotechnical investigations of borrow materials and flood risk reduction improvements are designed in consideration of the longevity of the levee system, including secondary seismic hazards such as shaking, liquefaction, subsidence, and seiches.

7 CONSULTATION AND COORDINATION

This chapter summarizes public and agency involvement activities undertaken by USACE and SAFCA that have been conducted to date, are ongoing, and/or will be conducted for this project, and which satisfy NEPA and CEQA requirements for public scoping and agency consultation and coordination.

Additionally, Native American consultation activities are described.

7.1 PUBLIC INVOLVEMENT UNDER NEPA AND CEQA

7.1.1 NOTICE OF INTENT, NOTICE OF PREPARATION, AND SCOPING MEETINGS

USACE published the notice of intent (NOI) to prepare the American River Common Features General Re-evaluation Report (GRR) EIS in the *Federal Register* (Vol. 73, No. 41) on February 29, 2008. A series of public scoping meetings were held in March 2008 to present information to the public and to receive public comments on the scope of the EIS. There is no mandated time limit to receive written comments in response to the NOI under NEPA. Because the Natomas PACR/Phase 4b Project is a component of the American River Common Features GRR, a separate NOI for the Natomas Post-authorization Change Report (PACR)/Phase 4b Project does not need to be re-issued. **Appendix A1** contains the NOI, the one comment letter received in 2008 (which is also summarized in **Table 7-1**), and copies of the posters for the March 2008 scoping meetings.

Table 7-1
Written Comments Received on the NOI

Commenter	Date
California Department of Transportation	April 1, 2008
▸ Requests clarification as to which portions of the project will use trucks to haul materials and which will use waterside barges for hauling materials. ▸ Requests a Traffic Management Plan including necessary mitigation, haul routes, dates of operation, and truck trip volumes be prepared in order for review. ▸ Notes that an encroachment permit will be required if electronic warning signs will be used within State right-of-way at work sites to warn public of trucks entering or leaving state highways. ▸ Expresses concern about piezometer locations and wells near the subgrade section of I-5 (the Boat Section) and requests these sites be identified and not be disturbed during levee improvement. ▸ Requests maps describing the project "activity areas" and clarification of the scope of the project and potential impacted highway and bridge structure areas. ▸ Requests identification and notification of any work near State right-of-way.	

Note: I-5 = Interstate 5

Source: Data Compiled by AECOM in 2009

On November 5, 2009, SAFCA issued a notice of preparation (NOP) for this EIS/EIR. In addition to the State Clearinghouse's distribution of the NOP to potentially interested state agencies, copies of the NOP were distributed to approximately 900 recipients, including Federal, state, regional, and local agencies; non-profit and private organizations; homeowners associations; partnerships; businesses; and individual residents in the project area to solicit input as to the scope and content of this EIS/EIR (see Section 7.4, "List of Recipients"). Because the distribution list likely did not account for all affected parties in the Phase 4b Project footprint, USACE and SAFCA published a notice in *The Sacramento Bee* on November 5, 2009. The NOP was circulated for a 30-day public comment period, in accordance with the State CEQA Guidelines, which closed on December 4, 2009. **Appendix A2** contains the NOP and comment letters received.

A joint NEPA/CEQA public scoping meeting was held on November 18, 2009 from 4:30 to 6:30 p.m. at the South Natomas Community Center in Sacramento, California, to brief interested parties on the Natomas PACR/Phase 4b Project and obtain the views of agency representatives and the public on the scope and content of this EIS/EIR. Copies of the posters for the November 18th scoping meeting are also included in **Appendix A2**.

Verbal and written comments were received during the scoping meeting, and additional written comments from agencies and individuals were received throughout the CEQA scoping period. All comment letters received during the scoping period are included in **Appendix A2** and are summarized in **Table 7-2**.

Table 7-2
Written Comments Received on the NOP

Commenter	Date
Federal Agencies	
Federal Aviation Administration	December 2, 2009
▸ Expresses concern regarding creation of habitat near the Airport that could potentially attract wildlife hazardous to aviation and increase wildlife-aircraft collision strikes. ▸ Requests that the EIS/EIR analyze whether the proposed improvements and mitigation measures are consistent with the guidelines in FAA AC 150/5200-33B. ▸ Recommends that a wildlife biologist meeting the requirements of FAA AC 150/5200-36 *Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments* (June 28, 2006) be included in the team conducting the analysis. ▸ Recommends that the EIS/EIR select an alternative that includes managing vegetation on NLIP areas within 10,000 feet of the Airport so as to minimize its attractiveness to hazardous wildlife and minimize the potential for wildlife-aircraft collisions. ▸ Recommends that SAFCA and USACE contact SCAS regarding the County's efforts to minimize the attractiveness of the Airport to wildlife potentially hazardous to aircraft. ▸ Requests a paper copy and CD of the DEIS/DEIR when it is released for public review.	
State Agencies	
State of California Governor's Office of Planning and Research, State Clearinghouse and Planning Unit	November 5, 2009
▸ Courtesy notice that specifies that responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency.	
California Highway Patrol	December 3, 2009
▸ Expresses concern regarding the project's adverse effects on traffic using Garden Highway and adjacent roadways. ▸ Expresses concern for higher volume of traffic caused by detours on West El Camino Avenue, Richards Boulevard, SR 160, and I-80.	
Local Agencies	
Sacramento County Airport System	December 3, 2009
▸ States that SCAS has nothing new to add to what SCAS has conveyed previously.	
Sacramento County Department of Transportation	November 25, 2009
▸ Expresses concern that truck haul routes on rural roadways will create a significant impact and shorten the life of the pavement. Asks that a maintenance agreement with SACDOT's Maintenance and Operations Section be negotiated. ▸ Requests that the proposed roadway closure and detour plans be coordinated with SACDOT. ▸ States that the project would result in a change of geometrics at the side street intersections with Garden Highway at Powerline Road and San Juan Road and requests proposed improvement plans be coordinated with SACDOT. ▸ Requests that power pole relocation be coordinated with SMUD and SACDOT to avoid conflicts with the intended bike/pedestrian path.	
Sacramento Metropolitan Air Quality Management District	November 18, 2009
▸ Confirms receipt of NOP and indicates that an NOP comment letter will not be provided.	

Table 7-2
Written Comments Received on the NOP

Commenter	Date
Sutter County, Community Services Department	November 23, 2009
▸ Requests the project's impacts to the proposed borrow site excavation and reclamation area east of the NCC and east Natomas Basin levee be analyzed based on its classification as Prime Farmland and Farmland of Statewide Importance by the California Department of Conservation. ▸ Requests that the reclamation of this site be to a use consistent with the County's Agriculture, 80-acre minimum General Plan designation (AG-80) and General Agricultural Zoning District (AG). ▸ States that removal of soil from proposed borrow sites is subject to SMARA and that a permit and reclamation plan is required to be approved by Sutter County. ▸ Recommends that SMARA be analyzed as part of the proposed environmental document and all feasible and effective mitigation be incorporated into the project. ▸ Requests analysis of potential impacts on Sankey Gap. ▸ Requests analysis of impacts on Pleasant Grove Cemetery and that feasible mitigation be incorporated into the project. ▸ Requests that the impacts to the "Out of Basin Mitigation Area" or "Area B" be evaluated and potential mitigation land be analyzed. ▸ Requests to be provided with all future notices regarding this project.	
Sutter County, Public Works Department	
▸ Requests an addendum to the Roadway Repairs Agreement dated August 21, 2009 due to the addition of the Triangle Properties Borrow Area and possible impacts to Fifield Road and Keys Road used as haul routes. ▸ Advises that a bridge rehabilitation project will begin in May 2010 on Pleasant Grove Road south of Keys Road causing traffic to possibly detour onto Keys Road and Fifield Road not allowing the contractor for borrow operations to use "wider than legal" equipment on these county roads.	
City of Sacramento, Parks and Recreation Department	December 1, 2009
▸ Notes the existence of several parks bordered by Garden Highway in Reaches A:16-20 including Park Site SN2 (Undeveloped; APN 274-0220-047); Shorebird Park (Developed; APN 274-0560-024 and 025); Natomas Oaks Park (Developed: APN 274-0320-023 and 033, 274-0050-033); Sand Cove Park (Developed; APN 274-0020-064, 274-0220-066, and 022), and McClellan Docks (Developed; APN 274-0030-020). ▸ Requests that each of the above parks be addressed and anticipated impacts assessed. In the event of unavoidable impacts related to access, tree removal/relocation (SN2) mitigation options are requested. ▸ Requests discussion of Gardenland Park (along NEMDC South) regarding access, shrinkage of acreage, and impacts to the planned improvements specified in the master plan approved in March 2009. ▸ Requests Fisherman's Lake Park and Open Space be included in discussion. ▸ Requests notification when the DEIS/DEIR is available to review.	
City of Sacramento, Department of Transportation	December 4, 2009
▸ States that prior to beginning of construction, a "Construction Traffic Control Plan" for the City of Sacramento streets should be prepared by the project proponent to the satisfaction of the City Traffic Engineer and subject to review by all affected agencies and a copy submitted to local emergency response agencies at least 14 days prior to commencement of construction that may partially or fully obstruct roadways. ▸ Notes that an encroachment permit will be required for all work within the public right-of-way, specifically for reconstruction of intersections and roadways. ▸ Identifies specific parcels related to possible impacts to mature heritage trees, bike trails, city parks, city streets, pump stations, and emergency access roads and requests they be evaluated for impacts. ▸ Requests that the DEIS/DEIR discuss the degree of change to the bike trail on the NEMDC levee and any detour routes or changes to access points. ▸ Requests clarity on any possible modifications to the bike trail along the West Canal (I-80 to San Juan Road) and provision of mitigation if necessary. ▸ Poses the following questions regarding the Natomas Levee Recreational Trail Project: Will the trail be continuous and a paved Class I bikeway at the conclusion of the project? Will the trail replace existing bike trails? Will this trail provide connection to existing bike trails that lead to and from the project site? Will construction of the paved surface require local jurisdictions to provide funding? If so, how will this be addressed? ▸ Requests that the City of Sacramento review the trail construction plans to ensure compliance with established standards and that locations where the trail crosses city streets will need detailed planning to ensure safe crossings.	

Table 7-2
Written Comments Received on the NOP

Commenter	Date
Organizations	
Garden Highway Community Association	December 4, 2009
▸ Expresses concern and states that SAFCA and USACE have not considered all alternatives based on an unbiased study to determine the most economically and environmentally sound project design for the NLIP and is therefore in violation of CEQA and NEPA requirements. ▸ States that "SAFCA and its contractors are in a race to remove highly sensitive habitat within the entire project footprint, despite the fact that alternative, less obtrusive levee improvement designs are gaining momentum and the fact that the Project is facing insurmountable fiscal problems." ▸ Suggests that SAFCA and USACE consider alternative designs to accomplish the necessary flood protection, the goal being to lessen the monetary, environmental, and property-loss cost. ▸ Suggests that 500-foot-wide berms are overkill and should be able to be reduced significantly and still achieve adequate flood protection. ▸ States that analysis of existing conditions must be evaluated measured against the "real conditions on the ground." ▸ States that a baseline of environmental conditions be established for the change in environmental conditions to be evaluated. ▸ States that the project plans fail to describe the existing physical environmental conditions to determine the significant adverse impacts on the existing environment but rather use a hypothetical computer model. ▸ States that there is a lack of evaluation of current levee and canal conditions. ▸ Requests that new Federal rules such as the more frequent flooding of the Yolo Bypass be considered in the plans including incorporating lowering of Sacramento River weirs as a long-term solution. ▸ Notes previous DFG comments in support of the idea that wildlife including woodlands, threatened and sensitive species habitat, and waters of the United States are not adequately considered and long-term mitigation may not be sufficient. ▸ Notes that the promise of creating 3 acres of woodland for each 1 acre destroyed does not consider the growing period for the new woodland. ▸ Suggests that SAFCA and its contractors are moving ahead with clear-cutting without funding in place for the planned mitigation. ▸ Expresses concern about the existence of an agreement between SAFCA and TNBC regarding post-reclamation land use of borrow sites. ▸ States that SAFCA and USACE have not evaluated the simultaneous multi-phase construction, which would be unreasonably harmful to wildlife, the environment, and Garden Highway residents. ▸ Expresses concern over the current position regarding encroachments and description regarding proposed action on the landside and waterside of the levee. ▸ Requests encroachments slated for removal be identified specifically. ▸ Expresses concern about proposed 24/7 construction and challenges whether it is justifiable. ▸ States a failure to address impacts to businesses along Garden Highway. ▸ Expresses concern over possible increased flood risk to waterside land owners within the NLIP area. ▸ Requests USACE divulge their position and methods of evaluating the possible increased flood risk to waterside properties. ▸ Expresses concern over changes in property values. ▸ Expresses concern about planned development after completion of the NLIP. ▸ States failure of NOP to mention the settlement agreement between SAFCA and GHCA. ▸ Expresses concern about methods used to obtain right-of-entry agreements from private property owners along Garden Highway. ▸ Requests that any further right-of-entry agreements be accompanied by a notification to the property owner as to "the legal authority upon which the agency relies, along with a full description of the associated rights afforded the property owners." ▸ "Objects to the 'taking' of private lands pursuant to the Eminent Domain laws under the guise that these lands are necessary for the development of the Project, when in fact the involved agency actually and surreptitiously plans to convey the condemned land to another private party, i.e., the airport." ▸ Concern as to the proposed funding mechanism related to the Natomas Levee Recreational Trail Project.	

Table 7-2
Written Comments Received on the NOP

Commenter	Date
Sacramento Area Bicycle Advocates	December 4, 2009
▸ Expresses appreciation that the Phase 4b Project includes the Natomas Levee Recreational Trail Project and notes benefits it will have on the community. ▸ Notes adverse impacts to existing bicycle routes for recreational and utilitarian purposes including Garden Highway and its intersecting streets and Ueda Parkway bike trail along the NEMDC. ▸ Suggests mitigation for these impacts including alternative bicycle access through or adjacent to construction areas, proper advance signage for detours or route changes, access to bicycle devices at traffic signals, signage for vehicle operators to ensure safety of bikers, maximum vehicle speed limits of 25 mph where separate bicycle lanes cannot be provided, and advance development of Traffic Control Plans that show traffic control measures for bicyclists with the plans reviewed and approved before construction begins and noticing to bicycle-interest organizations in the Sacramento area. ▸ Suggests establishing connections to the Ueda Parkway bike trail to Indiana Avenue, Senator Avenue, Rosin Court, Tandy Court, and North Market Boulevard during reconstruction.	
Individuals	
Dan Kaufman	November 9 and December 4, 2009
▸ Requests clarification as to why property located north of Sankey Road to Howsley Road is not identified as a potential borrow site. ▸ Requests notification of proposed plans related to this property.	
Shirley and Robert Wallace	November 10, 2009
▸ Requests clarification as to the extent of the identified "new potential borrow site" located on their property bordering Fifield Road in Pleasant Grove, Sutter County.	
Michael and Sara Johnson	November 25, 2009
▸ Expresses concern about property value dropping as a result of construction. ▸ Expresses concern regarding negative effects of proposed 24/7 construction on their family's health and well being. ▸ Expresses concern regarding unlivable conditions during construction and possible consequences. ▸ Expresses concern about lack of advanced notification to Swainson Way residents. ▸ Requests direct communication with homeowners on Swainson Way regarding levee improvements and construction impacts.	
Phil Perry	December 2, 2009
▸ Expresses concern about waterside vegetation preservation. ▸ Expresses concern about cutoff walls and levee degradation related to moisture content in soil. ▸ Requests a more specific design to identify the limits and evaluate the project's impacts. ▸ Requests clarification on modifications to pumping plants, specifically Pumping Plant No. 1. ▸ Expresses concern about proposed 24/7 construction in residential areas. ▸ States that vouchers for temporary housing during 24/7 construction are insufficient. ▸ States that a 250-foot-wide seepage berm is infeasible in the heavily populated Reach A:19B. ▸ Expresses concern that new work does not have a "discernable difference in flood protection from what SAFCA proposed back in the mid 1990s." ▸ Questions the need for additional work on the levee based on the *Natomas Levee Program Update* (March 20, 2008). ▸ Requests re-evaluation of plans to avoid overbuilding the levee in residential areas.	
Javed Siddiqui	December 2, 2009
▸ Expresses concern for preservation of historic, cultural, environmental, and economic value and benefits of resources potentially affected. ▸ Requests review and inclusion of *The Sacramento Bee* article about Heritage Oaks. ▸ Requests review of letters dated November 11 and 12, 2009. ▸ Requests that alternate option for seepage trench be explored to lessen the levee footprint.	

Table 7-2
Written Comments Received on the NOP

Commenter	Date
Kevin McRae	December 3, 2009
▸ Requests that vegetation removal within the levee right-of-way be minimized especially related to the taking of Heritage Oaks and waterside riparian habitat. ▸ Requests that USACE be sensitive to homeowner concerns regarding waterside encroachments. ▸ Requests that power poles be relocated to the landside as much as is practical for the safety and aesthetic concerns of residents. ▸ Requests that waterside residence structures (gates, fences, driveways) be modified or removed as little as possible.	
Roger Sherman	December 3, 2009
▸ Requests that April 2009 amendments to the State CEQA Guidelines for greenhouse gas emissions be discussed. ▸ Expresses concern about the level of evaluation and impact analysis related to Heritage Oak trees in Reach A:16.	
Robert Orr	December 3, 2009
▸ Expresses concern and requests elimination or significant mitigation of Garden Highway closures, 24/7 construction activities, destruction of landside encroachments (oak groves), and destruction of waterside encroachments (valley oaks).	
Dr. Del Wright and Patricia E. Nealon	December 4, 2009
▸ Expresses concern about Heritage Oaks slated for destruction. ▸ Requests that Javed Siddiqui's alternate plans be evaluated before the project moves forward.	
Ed and Patti Bronder	December 4, 2009
▸ Echoes comments submitted by Dr. Del Wright and Patricia E. Nealon.	
Melissa Brown	December 4, 2009
▸ Agrees and joins in concerns raised by GHCA, Mr. Sherman, and Mr. Siddiqui. ▸ Expresses concern about emergency vehicle access to 2317 Garden Highway (Reach A:16). ▸ Expresses concern as to impacts to well water quality, 24/7 construction impacts on Garden Highway; health impacts (asthma complications related to dust, diesel, and gasoline fumes); noise impacts; lighting during dusk and dawn hours; decrease in property value and tax implications; the denuding of the levees (and property and surrounding property); environmental impact to natural access to the river by wildlife (deer, squirrels, raccoons, possums, skunks, fox, beavers, hawks, owls, magpies, hummingbirds, ducks, geese and other birds, bees, butterflies, and other insects); appropriate mitigation for homeowners loss of quiet enjoyment of homes; and reduced value during construction. ▸ Expresses concern about slurry wall clean-up methods.	
Josh W. Harmatz	December 4, 2009
▸ Notes agreement with comments of fellow residents and GHCA. ▸ Specifically mentions preserving trees on the landside and waterside of the levee.	
Richard and Judee Myers	December 4, 2009
▸ Notes agreement with comments of fellow residents and GHCA.	
Tyson M. Shower	December 4, 2009
▸ Notes agreement with comments of fellow residents and GHCA. ▸ Notes concern regarding permitted encroachments (i.e., well, propane tank, and driveway). ▸ Notes obligation to SAFCA or USACE to be responsible for any relocation expenses that may occur.	
Melvin Borgman	December 4, 2009
▸ Asks how Sankey Gap and overflow of water particularly to the east side of the WP/SP Railroad at high-water events will be addressed. ▸ Asks to what elevation PGCC and NEMDC will be raised. ▸ Asks how erosion repair and rock slope protection will affect upstream water levels at PGCC and NEMDC. Will materials placed on the waterside of the levee increase water levels upstream? ▸ States that culverts along the PGCC are the only means of drainage for the areas between the WP/SP Railroad and the PGCC.	

Table 7-2
Written Comments Received on the NOP

Commenter	Date
▸ Expresses concern that fill material added to the waterside of the NCC south levee will restrict the westerly flow of water and increase uplift and lateral forces on bridges. Offers possible solutions including reinforced concrete overlay on levee surface, extending down to firm subsoil and excavating additional material under bridges to facilitate flow. ▸ Suggests using borrow sites for retention ponds for storm runoff and suggests deepening the NCC and PGCC to reduce flooding in areas upstream and using this material for borrow. ▸ Suggests that any material or structures placed waterside on the levee (Sacramento River left bank) will increase water levels upstream. ▸ Suggests additional/alternative actions to be included in the project including: improvements to the Yolo Bypass, levee setbacks at a minimum of 1,000 feet to provide more width to channels and lowering water levels in the river, removal of levees from "islands" created in the Delta and East Bay estuaries, and reduction or curtailment of discharge of drainage water into the river system during periods of high water. ▸ Notes the project's probable environmental impacts including increased risk of flooding in south Sutter County, particularly Pleasant Grove and damages that may be associated with such risk. ▸ Notes visual impacts to raising levees. ▸ Expresses concern about adequately addressing impacts of the project on surrounding communities.	
Vicki Pfingst and Susan Fast	December 4, 2009
▸ Agrees with comments from fellow residents and GHCA.	
Ronald Johnson	December 4, 2009
▸ Requests further information, limits, and right-of-way acquisition extent related to project design. ▸ Requests clarification on means to save Heritage Oaks and suggests eliminating seepage berms east of the I-80 Bridge. ▸ Requests clarification on waterside vegetation removal. ▸ Requests limits on noise and light pollution related to Garden Highway construction. ▸ States that 24/7 construction is unacceptable related to cutoff walls and suggests using double and triple crews instead. ▸ States that proposed power pole relocation from top of levee to bottom of slope is unacceptable and suggests burying them at shallow depths along the road serving the riverfront parcels. ▸ Requests clarification of impacts at "Tim Lewis" specific to the oak tree stand at west end of the reach, confirmation of the treatment for the top of the berm, and beautification at the 12-foot-wide transition slope that would extend to the sidewalk. ▸ Requests a design plan at Reaches A:19A and 19B showing the bike trail plans.	
Scoping Meeting	
Manuel Jardin	November 18, 2009
▸ Expresses concerns about the use of haul roads including Powerline, Del Paso, and San Juan Roads and requests that at least one of these remain open to the public and not be used as a haul road at any given time to avoid public interaction with large trucks. ▸ Requests that trucks used for hauling not be equipped with a compression break to reduce noise pollution.	
Kieth Seegmiller	November 18, 2009
▸ Expresses concern about the lead agency switching from SAFCA to USACE and losing contact with local agencies.	
Charlotte Borgman	November 18, 2009
▸ Expresses concern about increased water drainage to the east of the Natomas Basin and requests clarification of drainage plans.	

Notes: Airport = Sacramento International Airport; EIS/EIR = environmental impact report/environmental impact statement; FAA = Federal Aviation Administration; AC = Airport Circular; NLIP = Natomas Levee Improvement Program; SAFCA = Sacramento Area Flood Control Agency; USACE = U.S. Army Corps of Engineers; SCAS = Sacramento County Airport System; DEIS/DEIR = draft environmental impact report/draft environmental impact statement; NOP = notice of preparation; SR = State Route; I-80 = Interstate 80; SACDOT = Sacramento County Department of Transportation; SMUD = Sacramento Municipal Utility District; NCC = Natomas Cross Canal; SMARA = State Surface Mining and Reclamation Act; APN = Assessor's Parcel Number; PGCC = Pleasant Grove Creek Canal; NEMDC = Natomas East Main Drainage Canal; CEQA = California Environmental Quality Act; NEPA = National Environmental Policy Act; DFG = California Department of Fish and Game; TNBC = the Natomas Basin Conservancy; 24/7 = 24 hours per day, 7 days a week; GHCA = Garden Highway Community Association; WP/SP = Western Pacific/Southern Pacific
Source: Data Compiled by AECOM in 2009

7.1.2 DEIS/DEIR

The DEIS/DEIR was distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. The review period began on July 2, 2010 and closed on August 16, 2010.

Four public meetings were held during the review period. These meetings included the following:

- July 13, 2010 from 5:00 p.m. to 7:00 p.m. at the South Natomas Community Center located at 2921 Truxel Road, Sacramento, California;
- July 15, 2010 at 3:00 p.m. (as part of the SAFCA Board of Directors Meeting) at the Sacramento City Council Chambers located at 915 I Street, Sacramento, California;
- July 21, 2010 from 5:30 p.m. to 7:30 p.m. at the Sacramento County Administration Building Hearing Room 1located at 700 H Street, Sacramento, California; and
- August 4, 2010 from 5:00 p.m. to 6:30 p.m. at the Pleasant Grove School located at 3075 Howsley Road, Sacramento, California.

In addition, written comments from the public, reviewing agencies, and stakeholders were accepted throughout the public comment period. These comments, along with the written responses to those comments, are contained in **Appendix I**, "Responses to Comments on the DEIS/DEIR," of this FEIS/FEIR. Corrections, revisions, additions, and/or deletions to the text of the DEIS/DEIR are provided in **Appendix I**. Deleted text is shown in ~~strikeout~~ and added text is shown in underline. These text revisions are not shown in the FEIS/FEIR as changes; the FEIS/FEIR contains a clean reprint of the document.

7.1.3 NEXT STEPS IN THE ENVIRONMENTAL REVIEW PROCESS

This FEIS/FEIR will be distributed for public and agency review and comment, in accordance with NEPA and CEQA requirements. NEPA requires a 30-day public review for an FEIS, whereas CEQA requires a 10-day (for commenting agencies only) review for an FEIR. For this FEIS/FEIR, the NEPA and CEQA review periods will run concurrently, with the CEQA review period ending before the NEPA review period.

After the CEQA review period, the SAFCA Board of Directors will consider certifying the EIR if it is determined to be in compliance with CEQA, and will rely on the certified EIR when considering project approval. To support a decision on the project, the SAFCA Board of Directors must prepare and adopt written findings for each significant environmental impact identified in the EIR; a Statement of Overriding Considerations, if needed; and a Mitigation Monitoring and Reporting Program (MMRP) to ensure implementation of the mitigation measures and project revisions, if any, identified in the EIR. Following EIR certification and project approval, a Notice of Determination (NOD) documenting the decision will be issued.

After the NEPA review period, USACE will consider the Phase 4b Project and issue its record of decision (ROD). The ROD will identify USACE's decision regarding the alternatives considered, address substantive comments received on the FEIS, and determine whether the Adjacent Levee Alternative (Proposed Action) complies with Sections 408, 404, and 10.

7.1.4 OTHER PUBLIC OUTREACH ACTIVITIES

To help the community stay informed about current project activities, information is provided in a variety of ways:

- USACE and SAFCA each maintain Web sites (http://www.spk.usace.army.mil and http://www.safca.org/Programs_Natomas.html, respectively) that contain public documents related to the NLIP. Additionally, SAFCA's Web site contains public notices, project maps, schedule updates, news articles, SAFCA Board of Directors meeting agendas and meeting summaries, and other project-related materials;

- SAFCA periodically mails Executive Director Updates to property owners located adjacent to the NLIP project footprint;

- NLIP updates are provided at the monthly SAFCA Board of Directors meetings, which typically occur on the third Thursday of each month. These meetings are held at the Sacramento County Board of Supervisors Chambers at 700 H Street, Sacramento, California, 95814 and begin at 3:00 p.m.; and

- SAFCA has held several meetings with landowner groups and other interest groups during conceptual project design and will continue to meet with these groups to address concerns and interests.

7.1.5 Major Areas of Controversy

Based on the comments received during the scoping period and the history of the NEPA and CEQA processes undertaken by USACE and SAFCA, respectively, the major areas of public controversy associated with the project are:

- temporary, construction-related effects (especially noise and access issues) on residents and businesses adjacent to the project levees (including potential 24/7 construction);

- the hydraulic modeling used to analyze the project's hydraulic impacts;

- construction-related impacts on cultural and biological resources;

- vegetation and tree removal and relocation of utilities, including power poles;

- removal of agricultural lands and loss of opportunity for future development; and

- SAFCA's ability to fund mitigation measures.

The first two issues were the subject of a lawsuit, filed in December 2007, by the Garden Highway Community Association challenging the Phase 2 EIR prepared by SAFCA, which was settled. A copy of the settlement agreement is included as **Appendix A3**, and applies to all affected Garden Highway residents. Many of the agreements made by SAFCA in this settlement agreement regarding construction practices also have been incorporated into the Phase 3–4a Projects or, as appropriate, in the mitigation measures for those project phases. SAFCA intends to voluntarily apply the design and construction provisions in the agreement to all Sacramento River east levee components of the Phase 4b Project in the event that SAFCA chooses to implement the Phase 4b Project without Federal participation. While USACE is not bound by the settlement agreement, USACE nevertheless plans to implement some of the measures contained therein; these measures are incorporated into the project or reflected, as appropriate, in the mitigation measures in this EIS/EIR.

Other issues, including potential 24/7 construction, vegetation and tree removal, relocation of utilities (including power poles), and impacts to agricultural lands have been raised in comment letters by affected property owners. USACE and SAFCA have and will continue to respond to these issues, most recently in responses to comments on the Phase 4a FEIS and FEIR. Additionally, USACE and SAFCA continues to work individually with these property owners to respond to concerns.

Allegations regarding construction-related impacts on cultural and biological resources and SAFCA's ability to fund mitigation measures were the subject of a Petition for Writ of Mandate and Complaint for Injunctive Relief (Petition) filed in March 2009 by the Garden Highway Community Association challenging the adequacy of the Phase 2 Supplemental EIR under CEQA. This suit was voluntarily dismissed on October 22, 2009. In June 2009, both the Garden Highway Community Association and the Association for the Environmental Preservation of the Garden Highway filed Petitions challenging certification of the Phase 3 EIR. Both petitions made allegations similar to those contained in the 2007 and March 2009 lawsuits, including the issues described above. In July 2009, the Association for the Environmental Preservation of the Garden Highway dismissed its lawsuit challenging the Phase 3 EIR.

In December 2009, both the Garden Highway Community Association and the Association for the Environmental Preservation of the Garden Highway filed Petitions challenging certification of the Phase 4a EIR.

7.2 NATIVE AMERICAN CONSULTATION

7.2.1 SECTION 106 COMPLIANCE

USACE is the lead agency for Native American consultation under NEPA. On May 1, 2008, the California State Historic Preservation Officer (SHPO) signed the Programmatic Agreement (PA) among USACE, SAFCA, and the SHPO, regarding the issuance of permission under the authority of Sections 408 and 404 for the NLIP Landside Improvements Project. USACE consulted the Ione Band of Miwok Indians, the Shingle Springs Band of Miwok Indians, and the United Auburn Indian Community, and invited them to concur in this PA. On June 23, 2008, the Central Valley Flood Protection Board concurred in the PA. The PA envisioned that preparation of inventory reports for consultation between USACE and the SHPO for identification of Areas of Potential Effect (APEs) would be based on project phases. USACE, SAFCA, and the SHPO compiled a list of members of the interested public who were provided notice of this PA. The Section 106 process requires that USACE make good faith efforts to identify and take into account the opinions and preferences of local Native Americans with cultural ties to the APE, as well as the public for historic preservation actions taken in accordance with the PA. Native American monitors have been assisting SAFCA in the treatment of Native American human remains and items associated with Native American burials discovered during project activities in accordance with California Public Resources Code Section 5097.98 and California Health and Safety Code Section 7050.5(b) and 7050.5(c).

In April 2008, in response to requests from the project archaeologists, the Native American Heritage Commission (NAHC) identified a Most Likely Descendant (MLD) for the project, Mr. John Tayaba of the Shingle Springs Rancheria. Mr. Tayaba was designated as the MLD because he is a member of the Shingle Springs Band of Miwok Indians, and the Tribe's aboriginal territory includes the NLIP project area. Mr. Tayaba is being consulted with in regard to the disposition of prehistoric remains encountered in preliminary archaeological investigations in the project area. Shingle Springs Rancheria is a Federally recognized tribe and is actively participating in consultation regarding the identification and treatment of cultural resources subject to Section 106 of the National Historic Preservation Act.

In implementing the provisions of the PA, USACE archaeologists, SAFCA, AECOM archaeologists, and tribal representatives meet biweekly to discuss project progress, and the general approach to inventory, evaluation, and treatment of cultural resources for the project. Discussions include specific consideration of preferred construction methods from a tribal perspective, and treatment of identified and significant resources. Section 106 consultation is ongoing, and conducted in close coordination with Native Americans.

7.2.2 NATIVE AMERICAN CONSULTATION UNDER CEQA

SAFCA is the lead agency for Native American consultation under CEQA. During the scoping period for the Phase 2 Project, EDAW/AECOM (now AECOM) sent a letter of inquiry to the NAHC on June 12, 2007, asking for information or concerns regarding the project area, as well as a list of individuals or organizations that might

have information or concerns regarding the project area. On June 19, 2007, Debbie Pilas-Treadway of the NAHC responded and indicated that no known sites were found in the Sacred Lands File that were located within the project area or in the immediate vicinity. Ms. Pilas-Treadway also provided a list of individuals who could be contacted concerning cultural resources in the project area. These individuals were sent contact letters on June 21, 2007, with information regarding the proposed project and a request for any information they might provide or concerns that they might have about the project. No written responses were received; therefore, follow-up phone calls were made on July 9, 2007. Only one individual, Rose Enos (referred to by the NAHC as "Miwok/Maidu"), answered. Ms. Enos expressed general concern regarding avoidance of burial sites and asked to be contacted if work is conducted on such sites. Phone messages were left for the remaining people on the contact list; however, no response from any of these individuals was received. The correspondence is included in **Appendix E2**.

In addition, Randy Yonemura of the Ione Band of the Miwok was contacted in January 2008 for information on areas of concern. Mr. Yonemura led an archaeologist on a field visit of the project area and provided anecdotal information on areas of potential Native American burials. Since spring 2008, Native American monitors have been observing archaeological field efforts, as appropriate, and offering insight and advice regarding cultural resources finds. USACE and SAFCA continue to consult closely with the MLD designated under California Public Resources Code 5097.98 regarding the effect of the NLIP on cultural resources of concern to the Native American community.

7.3 COORDINATION WITH OTHER FEDERAL, STATE, REGIONAL, AND LOCAL AGENCIES

Chapter 6, "Compliance with Federal Environmental Laws and Regulations," describes the project's compliance with applicable Federal laws and regulations, including consultation to date with various agencies. The following briefly summarizes these consultation and coordination efforts.

7.3.1 COORDINATION WITH THE FEDERAL AVIATION ADMINISTRATION AND THE SACRAMENTO COUNTY AIRPORT SYSTEM

The Federal Aviation Administration (FAA) is acting as a cooperating agency under NEPA for the Phase 4b Project. USACE and SAFCA met with the FAA and the Sacramento County Airport System (SCAS) on September 10, 2008, regarding project features within the Sacramento International Airport (Airport) north bufferlands. The FAA and SCAS have noted that the Airport has developed the Airport's *Wildlife Hazard Management Plan* (WHMP), with which the Phase 4b Project would comply, to the extent practicable and feasible, to ensure aviation safety. Further, the FAA and SCAS have expressed concern that the project, if inappropriately designed, could change existing vegetation and wildlife habitat in ways that could attract wildlife hazardous to aviation safety and increase wildlife-aircraft collisions.

SCAS provided comments on the Phase 4a DEIS/DEIR, to which USACE and SAFCA responded in the Phase 4a FEIS and FEIR, respectively. Additionally, the FAA provided a comment letter in response to the Phase 4b NOP.

The FAA continues to be involved in reviewing environmental documents related to the Landside Improvements Project. USACE and SAFCA meet with the FAA as needed to discuss design of project components as it relates to the Airport and to ensure that the project would not interfere with implementation of the WHMP.

7.3.2 RESOURCE AGENCY COORDINATION

Over the course of project planning and environmental review for the NLIP Landside Improvements Project, USACE and SAFCA have coordinated informally with the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), the California Department of Fish and Game (DFG), and The Natomas Basin Conservancy (TNBC). **Table 7-3** includes permits and other resource agency coordination activities for past and

current NLIP project phases. A copy of the programmatic Biological Opinion and USACE Jurisdictional Determinations are included in **Appendix D**.

Table 7-3
NLIP Resource Agency Coordination[1]

Agency	Permit/Authorization/Approval	Status
Programmatic		
USFWS	Programmatic Biological Opinion	Issued October 2008; Amendment issued May 2009; Appendage issued September 2009; Appendage issued May 2010; Appendage issued October 2010
DFG, Central Valley RWQCB, USACE, and USFWS	Long-Term Management Plan Approval	Granted May 2009
Phase 2 Project		
USACE	Section 408 Permission	Granted January 2009
USACE	Section 404 Permit	Issued January 2009; amendment issued May 2009[2]; 2nd amendment issued August 2009; 3rd amendment issued February 2010
Central Valley RWQCB	Section 401 Water Quality Certification	Issued January 2009
DFG	Section 2081 Incidental Take Authorization	Issued May 2009
NMFS	Concurrence of Determination of Not Likely to Adversely Affect	January 2009
DFG	Section 1602 Streambed Alteration Agreement	Issued January 2009
USFWS	Biological Opinion	Issued October 2008; Amendment issued May 2009
USFWS	Fish and Wildlife Coordination Act Report	October 2008
Sacramento County	SMARA Exemption	Granted February 2009
Sutter County	SMARA Exemption	Granted February 2009
DFG, Central Valley RWQCB, USACE, and USFWS	Mitigation and Monitoring Plan	Approval granted May 2009
SWRCB	Section 402 NPDES General Construction Permit	Notice of Intent filed March 2009
Phase 3 Project[3]		
USACE	Section 408 Permission	Granted April 2010
USACE	Section 404 Permits[3]	Phase 3a permit received October 2009; Phase 3b permit received April 2010
USACE	Section 10 Permit	Phase 3a permit received October 2009; Phase 3b permit received April 2010
Central Valley RWQCB	Section 401 Water Quality Certifications[3]	Certifications received in September 2009 for Phase 3a and January 2010 for Phase 3b
DFG	Section 2081 Incidental Take Authorization	Issued June 2010

Table 7-3 NLIP Resource Agency Coordination[1]		
Agency	Permit/Authorization/Approval	Status
DFG	Section 1602 Streambed Alteration Agreement[4]	Landside canal footprint agreement received September 2009; later stages received February–April 2010
USFWS	Biological Opinion	Issued September 2009
NMFS	Concurrence of Determination of Not Likely to Adversely Affect (Phase 3b and 4a combined)	January 2010
USFWS	Fish and Wildlife Service Coordination Act Report	Draft received June 2009; final received October 2009
Sacramento County	SMARA Exemption	Exemption granted November 2009
DFG, Central Valley RWQCB, USACE, and USFWS	MMP	Approved by USACE September 2009; approved by all other agencies October 2009
SWRCB	Section 402 NPDES General Construction Permit	Notice of Intent submitted November 2009
Phase 4a Project		
USACE	Section 408 Permission	Anticipated October 2010
USACE	Section 404 Permit	Anticipated October 2010
USACE	Section 10 Permit	Anticipated October 2010
Central Valley RWQCB	Section 401 Water Quality Certification	August 2010
DFG	Section 2081 Incidental Take Authorization	Anticipated fall 2010
DFG	Section 1602 Streambed Alteration Agreement	Anticipated spring 2011
USFWS	Biological Opinion	Issued May 2010
NMFS	Concurrence of Determination of Not Likely to Adversely Affect (Phase 3b and 4a combined)	January 2010
USFWS	Fish and Wildlife Service Coordination Act Report	May 2010
Sacramento County	SMARA Permit and Exemption	Exemption granted November 2009 for most of the Fisherman's Lake Borrow Area, including Novak; Sacramento County determined that the northeastern corner of the Fisherman's Lake Borrow Area (called the Natomas Urban Development site) would require a SMARA permit
DFG, Central Valley RWQCB, USACE, and USFWS	Mitigation and Monitoring Plan	Approved by USACE September 2010; approval anticipated by all other agencies spring 2011
SWRCB	Section 402 NPDES General Construction Permit	Submitted July 2010

Table 7-3
NLIP Resource Agency Coordination[1]

Agency	Permit/Authorization/Approval	Status
Phase 4b Project		
USACE	Section 408 Permission	Would only be required for the Phase 4b Project if Federal authorization is not obtained and SAFCA chooses to proceed with Phase 4b Project implementation without Federal participation. Under this scenario, anticipated spring 2011
USACE	Section 404 Permit	Would only be required for the Phase 4b Project if Federal authorization is not obtained and SAFCA chooses to proceed with Phase 4b Project implementation without Federal participation. Under this scenario, anticipated spring 2011
USACE	Section 10 Permit	Would only be required for the Phase 4b Project if Federal authorization is not obtained and SAFCA chooses to proceed with Phase 4b Project implementation without Federal participation. Under this scenario, anticipated spring 2011
Central Valley RWQCB	Section 401 Water Quality Certification	Anticipated fall 2011
DFG	Section 2081 Incidental Take Authorization	Anticipated fall 2011
DFG	Section 1602 Streambed Alteration Agreement	Anticipated fall 2011
USFWS	Biological Opinion	October 2010
NMFS	Concurrence of Determination of Not Likely to Adversely Affect	Anticipated fall 2010
USFWS	Fish and Wildlife Service Coordination Act Report	October 2010
Sacramento County	SMARA Permit or Exemption	Anticipated fall 2011
DFG, Central Valley RWQCB, USACE, and USFWS	Mitigation and Monitoring Plan	Anticipated fall 2011
SWRCB	Section 402 NPDES Permit for General Construction	Anticipated fall 2011

Notes: USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; DFG = California Department of Fish and Game; RWQCB = Regional Water Quality Control Board; USACE = U.S. Army Corps of Engineers; SMARA = Surface Mining and Reclamation Act; SWRCB = State Water Resources Control Board; NPDES = National Pollutant Discharge Elimination System

[1] Although Phase 1 Project permitting and regulatory requirements were fulfilled, they are not included in this table because construction is complete.

[2] The Phase 2 Project Section 404 permit was amended based on the Amended Phase 2 Biological Opinion.

[3] The Phase 3 Project Section 404 permit and 401 certification has been separated into 2 subphases (a and b).

[4] The Phase 3 Project DFG 1602 Streambed Alteration Agreement will be separated into multiple stages.

Source: Data compiled by AECOM in 2009

7.4 LIST OF RECIPIENTS

The following elected officials and representatives; government departments and agencies; non-profit organizations, partnerships, private organizations, and businesses; media; and individual property owners received a copy of the DEIS/DEIR or a notice that it was available.

7.4.1 ELECTED OFFICIALS AND REPRESENTATIVES

- Doris Matsui, Congresswoman, 5th Congressional District
- Tom McClintock, Congressman, 4th Congressional District
- Roger Dickinson, Sacramento County Supervisor, District 1
- Jimmie Yee, Sacramento County Supervisor, District 2
- Susan Peters, Sacramento County Supervisor, District 3
- Roberta MacGlashan, Sacramento County Supervisor, District 4
- Don Nottoli, Sacramento County Supervisor, District 5
- James Gallagher, Sutter County Supervisor, District 5
- Mayor Kevin Johnson, Sacramento City Council
- Ray Tretheway, Sacramento City Council, District 1
- Sandy Sheedy, Sacramento City Council, District 2
- Steve Cohn, Sacramento City Council, District 3
- Rob Fong, Sacramento City Council, District 4
- Lauren Hammond, Sacramento City Council, District 5
- Kevin McCarty, Sacramento City Council, District 6
- Robbie Waters, Sacramento City Council, District 7
- Bonnie Pannell, Sacramento City Council, District 8
- William Kristoff, West Sacramento City Council

7.4.2 GOVERNMENT DEPARTMENTS AND AGENCIES

UNITED STATES GOVERNMENT

- Bureau of Indian Affairs, Pacific Regional Office
- Federal Aviation Administration
- Federal Emergency Management Agency, Region IX
- National Marine Fisheries Service
- Natural Resources Conservation Service
- U.S. Bureau of Reclamation, Central Valley Operations
- U.S. Coast Guard
- U.S. Department of Agriculture, National Rural Development Council
- U.S. Environmental Protection Agency, Division 9
- U.S. Fish and Wildlife Service

TRIBAL GOVERNMENT

- Shingle Springs Rancheria

STATE OF CALIFORNIA

State agencies that will receive the EIS/EIR via the State Clearinghouse are marked (*)

- California Bay-Delta Authority
- California Air Resources Board*
- California Department of Boating and Waterways, Regulations Unit
- California Department of Conservation*
- California Department of Education*
- California Department of Fish and Game, Region 2
- California Department of General Services*
- California Department of Health Services*
- California Department of Transportation, District 3*
- California Department of Toxic Substances Control*
- California Department of Water Resources
- California Environmental Protection Agency
- California Integrated Waste Management Board*
- California Regional Water Quality Control Board, Central Valley Region*
- Central Valley Flood Protection Board
- Native American Heritage Commission
- Office of Emergency Services*
- Office of Historic Preservation, State Historic Preservation Officer
- Office of Planning and Research, State Clearinghouse
- State Lands Commission, Division of Environmental Planning and Management
- State Water Resources Control Board*

REGIONAL, COUNTY, CITY, AND OTHER LOCAL AGENCIES

- Amador County
- American River Flood Control District
- Butte County
- Central Valley Flood Control Association
- City of Davis
- City of Sacramento
- City of Sacramento Department of General Services
- City of Sacramento Department of Parks and Recreation
- City of Sacramento Department of Transportation Engineering Services
- City of Sacramento Department of Utilities
- City of Stockton
- City of West Sacramento
- City of Woodland
- Colusa County
- Contra Costa County
- El Dorado County
- Feather River Air Quality Management District
- Natomas Central Mutual Water Company
- Natomas Unified School District
- Placer County
- Placer County Water Agency
- Port of Sacramento
- Reclamation District 150
- Reclamation District 307

- Reclamation District 537
- Reclamation District 730
- Reclamation District 785
- Reclamation District 900
- Reclamation District 999
- Reclamation District 1000
- Reclamation District 1001
- Reclamation District 1500
- Reclamation District 1600
- Reclamation District 2035
- Reclamation District 2068
- Regional Water Authority
- Rio Linda and Elverta Recreation and Park District
- Robla School District
- Sacramento Area Council of Governments
- Sacramento Area Sewer District
- Sacramento County
- Sacramento County Airport System
- Sacramento County Clerk/Recorder
- Sacramento County Department of Environmental Management
- Sacramento County Department of Environmental Review and Assessment
- Sacramento County Department of Regional Parks
- Sacramento County Department of Transportation
- Sacramento County Department of Water Resources
- Sacramento County Local Agency Formation Commission
- Sacramento County Municipal Services Agency
- Sacramento County Planning and Community Development Department
- Sacramento County Water Agency
- Sacramento Metropolitan Air Quality Management District
- Sacramento Metropolitan Fire District
- Sacramento Municipal Utility District
- Sacramento Regional County Sanitation
- San Joaquin County
- San Joaquin County Flood Control and Water Conservation District
- Solano County
- Sutter County
- Sutter County Clerk of the Board
- Sutter County Department of Public Works
- Sutter County Environmental Health Services
- Sutter County Planning Department
- Sutter County Resource Conservation District
- Sutter County Water Resources Division
- Three Rivers Levee Improvement Authority
- Twin Rivers Unified School District
- Yolo County
- Yolo County Flood Control and Water Conservation District
- Yolo County Parks and Natural Resources Management Division
- Yolo County Planning and Public Works Department
- Yuba County
- Yuba County Water Agency
- Yuba-Sutter County Farm Bureau

7.4.3 NON-PROFIT ORGANIZATIONS, PARTNERSHIPS, PRIVATE ORGANIZATIONS, AND BUSINESSES

- Alamar Restaurant
- APCO Worldwide
- Association for the Environmental Preservation of the Garden Highway
- California Native Plant Society, Sacramento Valley Chapter
- Cassidy & Associates
- Citizens for Good Government
- Community Watchdog Committee
- Creekside Natomas Neighborhood Association
- Dawson and Associates
- Delta Citizens Municipal Advisory Council
- Downtown Partnership
- Environmental Council of Sacramento
- Friends of the River
- Friends of the Sacramento River Greenway
- Friends of the Swainson's Hawk
- Garden Highway Community Association
- Gardenland-Northgate Neighborhood Association
- The Gualco Group
- Habitat 2020
- Heritage Park Homeowners Association
- Law Offices of Gregory Thatch
- Metro Airpark
- Natomas Chamber of Commerce
- Natomas Community Association
- Natomas Park Master Association
- North Natomas Alliance
- North Natomas Community Association
- Pacific Gas & Electric Company
- Planning & Conservation League
- Port of Sacramento
- Reach 7 Property Owners
- Regency Park Community Association
- Rio Linda Union School District
- Rio Ramaza Marina
- River Oaks Community Association
- River Oaks Ranch in Natomas, LLC
- Sacramento Area Bicycle Advocates
- Sacramento Association of Realtors
- Sacramento Builders Exchange
- Sacramento County Farm Bureau
- Sacramento County Taxpayers
- Sacramento Groundwater Authority and Regional Water Authority
- Sacramento Metro Chamber
- Sacramento Public Library, Central Library, Federal Documents
- Sacramento River Property Owners Association
- Save Our Sandhill Cranes
- Save the American River Association
- Sierra Club, Mother Lode Chapter
- Steinberg & Associates

- Sutter County Resource Conservation District
- Swabbies
- Terrace Park Neighborhood Association
- The Natomas Basin Conservancy
- The Nature Conservancy, Sacramento River Program
- Urban Creeks Council
- Valley View Acres Community Association
- Water Forum
- West Natomas Community Association
- West Sacramento Chamber of Commerce
- Wickland Pipelines, LLC

7.4.4 MEDIA

- Daily Recorder
- Folsom Telegraph
- N Magazine
- Sacramento Business Journal
- Sacramento News & Review
- The Sacramento Bee

7.4.5 INDIVIDUAL PROPERTY OWNERS

- Names withheld for privacy

8 REFERENCES

ARB. *See* California Air Resources Board.

BBN. *See* Bolt Beranek and Newman Inc.

Caltrans. *See* California Department of Transportation.

CAPCOA. *See* California Air Pollution Control Officers Association.

Central Valley RWQCB. *See* Central Valley Regional Water Quality Control Board.

CNDDB. *See* California Natural Diversity Database.

DFG. *See* California Department of Fish and Game.

DWR. *See* California Department of Water Resources.

EPA. *See* U.S. Environmental Protection Agency.

FAA. *See* Federal Aviation Administration.

FEMA. *See* Federal Emergency Management Agency.

FHWA. *See* Federal Highway Administration.

FRAQMD. *See* Feather River Air Quality Management District.

HUD. *See* U.S. Department of Housing and Urban Development.

ITE. *See* Institute of Transportation Engineers.

LSCE. *See* Luhdorff & Scalmanini, Consulting Engineers.

NCASI. *See* National Council for Air and Stream Improvement.

NMFS. *See* National Marine Fisheries Service.

NRCS. *See* Natural Resources Conservation Service.

OPR. *See* Governor's Office of Planning and Research.

PSMFC. *See* Pacific States Marine Fisheries Commission.

SAFCA. *See* Sacramento Area Flood Control Agency.

SACOG. *See* Sacramento Area Council of Governments.

Sacramento LAFCo. *See* Sacramento County Local Agency Formation Commission.

SCAS. *See* Sacramento County Airport System.

SGA. *See* Sacramento Groundwater Authority.

SMAQMD. *See* Sacramento Metropolitan Air Quality Management District.

TNBC. *See* The Natomas Basin Conservancy.

UCMP. *See* University of California Museum of Paleontology.

USACE. *See* U.S. Army Corps of Engineers.

USACE and SAFCA. *See* U.S. Army Corps of Engineers and Sacramento Area Flood Control Agency.

USFWS. *See* U.S. Fish and Wildlife Service.

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3.1 GENERAL SITE CONDITIONS

None.

3.2 AGRICULTURAL RESOURCES

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APPENDIX I

Responses to Comments on the DEIS/DEIR

APPENDIX I
RESPONSES TO COMMENTS ON THE DEIS/DEIR

This appendix contains the comment letters received on the Phase 4b DEIS/DEIR, including transcribed comments received during the July 15, 2010 public hearing[1], and USACE's and SAFCA's individual responses to significant environmental issues raised in those comments. Each letter, as well as each individual comment within the letter, has been given a number for cross-referencing. Responses are sequenced to reflect the order of comments within each letter. **Table I-1** lists all parties who submitted comments on the Phase 4b DEIS/DEIR during the public review period.

Table I-1
List of Commenters

Letter #	Commenter	Date of Comment	Page Number
Federal Agencies (F)			
F1	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region	August 9, 2010	I1-5
F2	U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Sacramento Area Office	August 9, 2010	I1-7
F3	U.S. Environmental Protection Agency, Region IX	August 16, 2010	I1-18
Tribal Government (T)			
T1	Shingle Springs Rancheria	July 21, 2010	I1-29
State Agencies (S)			
S1	State of California – The Resources Agency, Central Valley Flood Protection Agency	July 27, 2010	I1-37
S2	California State Lands Commission	August 12, 2010	I1-40
S3	State of California Department of Transportation, District 3 – Sacramento Area Office	August 17, 2010	I1-43
S4	Governor's Office of Planning and Research	August 17, 2010	I1-46
Local Agencies (L)			
L1	Sacramento Metropolitan Air Quality Management District	August 2, 2010	I1-51
L2	Sutter County Community Services Department	August 13, 2010	I1-57
L3	City of Sacramento Department of Transportation	August 16, 2010	I1-61
L4	Feather River Air Quality Management District	August 16, 2010	I1-72
L5	City of Sacramento Department of Parks and Recreation	August 16, 2010	I1-75
L6	Sacramento Regional County Sanitation District	July 20, 2010	I1-87
Organizations (O)			
O1	Sacramento Area Bicycle Advocates	August 13, 2010	I1-91
O2	Save the American River Association	August 16, 2010	I1-96

[1] In addition to the July 15 public hearing, three additional public meetings were conducted during the Phase 4b DEIS/DEIR public review period: July 13, 2010 at the South Natomas Community Center; July 21, 2010 at the Sacramento County Administration Building; and August 4, 2010 at the Pleasant Grove School. No formal comments were received at these three public hearings.

Table I-1 List of Commenters			
Letter #	Commenter	Date of Comment	Page Number
O3	Sacramento Tree Foundation	August 16, 2010	I1-99
O4	Garden Highway Community Association	August 17, 2010	I1-104
Businesses (B)			
B1	KVIE	July 14, 2010	I1-125
Individuals (I)			
I1	Jorge Jimenez, Ph.D., and Ron Selge	July 7, 2010	I1-131
I2	John Perry, Perry Farms Diversified Farming	July 28, 2010 and August 12, 2010	I1-136
I3	Imogene W. Amrine	July 28, 2010	I1-142
I4	Philip Day Perry	August 4, 2010	I1-146
I5	Melvin Borgman	August 15, 2010	I1-149
I6	Charlotte Borgman, C. Morrison Ranch	August 16, 2010	I1-153
I7	Roland L. Candee	August 16, 2010	I1-156
I8	Keith M. Seegmiller	August 16, 2010	I1-165
I9	Ronald Johnson, P.E.	August 16, 2010	I1-168
Public Hearing (PH)			
PH	July 15, 2010 Public Hearing	July 15, 2010	I1-173

FEDERAL AGENCIES

F1

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Pacific Southwest Region
1111 Jackson Street, Suite 520
Oakland, California 94607

IN REPLY REFER TO:
ER# 10/599

Electronically Filed

9 August 2010

Elizabeth Holland
Planning Division
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Dear Ms. Holland:

The Department of the Interior has received and reviewed the DEIS for the American River Watershed Common Features Project/Natomas Post-Authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project in Sacramento and Sutter Counties, CA and has no comments to offer. F1-1

Thank you for the opportunity to review this project.

Sincerely,

Patricia Sanderson Port

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC

Letter	United States Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region
F1	Patricia Sanderson Port, Regional Environmental Officer
Response	August 9, 2010

F1-1 Comment noted.

F2

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Sacramento Area Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

AUG - 9 2010

Elizabeth Holland
Planning Division
U.S. Army Engineer, Sacramento District
1325 J Street
Sacramento, California 95814

Dear Elizabeth Holland:

This is in response to your June 30, 2010, letter requesting technical assistance and comments from NOAA's National Marine Fisheries Service (NMFS) for the draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) on the American River Watershed Common Features Project/Natomas Levee Improvement Program (NLIP), Phase 4b Landside Improvements Project (Phase 4b Project) and the draft Natomas Post-authorization Change Report (Natomas PACR).

The draft EIS/EIR has been prepared by the US Army Corps of Engineers (Corps), Sacramento District and the Sacramento Area Flood Control Agency (SAFCA) in accordance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The Corps is the lead for NEPA compliance and SAFCA is the lead for CEQA compliance. F2-1

The regional setting of the Phase 4b Project is the 53,000 acre Natomas Basin at the confluence of the American and Sacramento rivers. The project location includes parts of the City of Sacramento and portions of Sacramento and Sutter counties. The Natomas Basin is bordered by the American River to the south, the Sacramento River to the west, the Natomas Cross Canal (NCC) to the north, and the Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal (NEMDC) to the east. The Phase 4b Project involves levee construction on portions of all of these rivers and canals.

The NLIP addresses identified deficiencies in the Natomas Basin perimeter levee system. The main goal of the project is to reduce flood risk to the Natomas Basin and to bring the levee system up to at least a certified 100-year flood risk reduction under regulations adopted by the Federal Emergency Management Agency. Phases 1, 2, 3, and 4a of the NLIP should be completed by 2012. Phase 4b specifically addresses underseepage, stability, erosion,

penetration, and levee encroachments along approximately 3.4 miles of the Sacramento River, 1.8 miles of the American River, 6.8 miles of the NEMDC, 3.3 miles of the PGCC, and portions of the NCC. Assuming all funding, authorizations, environmental and other permits are in place, construction of the Phase 4b Project should begin in 2012 and be completed by 2016.

The Federal lead for the proposed project is the Corps, and the state lead is SAFCA. The Federal Aviation Administration is acting as a cooperating agency for NEPA. In addition to completing an EIS/EIR, the lead agencies will also be fulfilling requirements as for Section 10 and 14 of the Rivers and Harbors Act, Section 408, Section 404 of the Clean Water Act, and the Federal and state Endangered Species Acts.

In addition to the needs mentioned above, this EIS/EIR will be used to support Congressional approval of the Natomas PACR. If Congress does not authorize Corps to construct Phase 4b Project, SAFCA may choose to proceed without Federal participation and the EIS/EIR will be used to support Corp's decisions pursuant to Section 408, 404, and 10.

The Natomas PACR was prepared by the Corps as the result of a reevaluation study of the American River Common Features project that identified changes to the Natomas portion of the authorized project. The Federal sponsor for the reevaluation study is Corps and the state sponsor is the Central Valley Flood Protection Board (CVFPB). SAFCA has a cooperation agreement with CVFPB. The changes identified do not change the purpose of the project, but they do change the project scope, timeline, design, potential impacts, and cost.

F2-1 (Con't.)

NMFS has reviewed the information provided with your June 30, 2010, letter. As stated in the Executive Summary and Chapters 4 and 7 of the draft EIS/EIR, under Section 7, the Corps must consult with NMFS to ensure that the Phase 4b Project will not jeopardize endangered or threatened species, or destroy or adversely modify designated critical habitat, as designated by the Federal Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). If the proposed project "may affect" a listed species or critical habitat, the lead agency is required to prepare a biological assessment (BA). In response to the BA, NMFS will issue a biological opinion with a determination on the impacts of the proposed project on listed species and critical habitat. Additionally, the Magnuson-Stevens Fishery Conservation and Management Act requires all Federal agencies to consult with NMFS regarding all action or proposed actions that my adversely affect Essential Fish Habitat.

As the project progresses, it is anticipated that the project proponents will seek out consultation as required under ESA. Be advised that NMFS can only enter section 7 consultation with another Federal agency or its designee. Future section 7 consultation for the Phase 4b Project will involve possible effects of the proposed project on the Federally listed threatened Central Valley (CV) steelhead (*Oncorhynchus mykiss*), the threatened Southern distinct population segment of North American green sturgeon (*Acipenser medirostris*), endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*), and threatened CV spring-run Chinook salmon (*O. tshawytscha*) and their critical habitats.

Some comments on the draft EIS/EIR and the Natomas PACR (found below) are general in nature, others relate to specific language in the draft EIS/EIR and Natomas PACR, and some are editorial.

VEGETATION REMOVAL AND VARIANCE COMMENTS

Central Valley levee vegetation has significant ecosystem importance. Vegetation along many levees provides critical fishery habitat and is ecologically significant to numerous ESA listed and protected species. Protection and enhancement of the riparian corridors is necessary for the survival and recovery of the Sacramento River winter-run and CV spring-run Chinook salmon and CV Steelhead.

Section 4.7.2 emphasizes that the Phase 4b Project could result in a direct loss of levee waterside vegetation. NMFS recommends pursuing a variance pursuant to the Central Valley Flood System Improvement Framework (Framework). NMFS acknowledges that on pages 2-24, 2-30, page 2-36 the EIS/EIR discloses the intent that Phase 4b Project will pursue a vegetation variance to allow waterside vegetation to remain. The Framework describes that major modifications of existing levee section will comply with the Corps' levee vegetation standards, but may allow vegetation to remain if these projects can demonstrate that the public safety risks posed to levee integrity have been adequately addressed and engineered into project design. The Central Valley Flood Protection Plan will be completed in 2012 and will outline levee vegetation policies. In the meantime, there are guidelines available on how to handle vegetation on levees. Additionally, NMFS encourages the project proponent to include assurances that habitat creation and preservation that is mitigation for the Phase 4b Project be successfully implemented. F2-2

Despite the mention of a variance in the draft EIS/EIR, the Natomas PACR lacks mention of obtaining a vegetation variance for levee work. This seems inconsistent with the EIS/EIR and the existing Framework. NMFS recommends that the Final Natomas PACR include a section detailing the desire to obtain a variance or a detailed explanation as to why a variance is not included as part of the Natomas PACR.

STANDARDIZED ASSESSMENT METHODOLOGY (SAM) COMMENTS

Prior to and during the process of any construction as part of the Phase 4b Project that impact waterside vegetation, NMFS recommends that you use the standardized assessment methodology (SAM) to evaluate the response to habitat features affected by bank protection projects. SAM is a modeling and tracking tool developed by Stillwater Sciences and was originally used for Corps Sacramento River Bank Protection Project (SRBPP). The SAM evaluates bank protection alternatives affecting threatened and endangered fish species. By identifying and quantifying the response of fish species to habitat conditions over time, users can determine necessary measures to avoid, minimize, or fully compensate for fish impacts for various life stages. F2-3

SAM has been used at numerous levee sites along the mainstem Sacramento River and tributaries as part of the SRBPP. Modeling outcome revealed long-term habitat losses and demonstrated the need for commensurate compensation measures and habitat enhancement such as: installing in-stream wood material for habitat complexity, planting riparian vegetation to stabilize the bank, and provide a source of shade and cover for channel margin habitat.

SPECIFIC COMMENTS

Throughout the document it is stated that without the levee repairs and upgrades flood risk will continue. While NMFS agrees with this statement, it is important to note that even with the improvements that are a part of the proposed project, there will still be potential flooding and risk of levee failure in the project area; this should be clearly stated in the final EIS/EIR. F2-4

Note: Both documents should have been with line numbers to simplify the review process. F2-5

PHASE 4b EIS/EIR

XIX: NLAP and NALP are both defined as North Area Local Project. NALP is used on page ES-7. F2-6

Page ES-4: The following is stated, "Sutter and Sacramento Counties", should be "Sutter and Sacramento counties". F2-7

Page ES-7: No apparent explanation or definition of an AE zone. F2-8

Page 1-2: The Federal Interest section is confusing. The purpose of the project is to increase levee protection to at least the 100 year flood protection and to the 200 year in the future thus ultimately reducing flood risk and flood damage in the Natomas Basin. Why is this not the Federal Interest? F2-9

Page 1-24: Plate 1-5 mentions that "approximately 15 sites..." In looking at Plate 1-5, there are 15 sites labeled. Not sure the "approximately" is appropriate. F2-10

Page 2-7: In section 2.1.3.4 there are discussions involving vegetation on the levees. There is no mention of the California Central Valley Flood System Improvement Framework that was put together in 2009. This Framework is to be used as a guide for vegetation on levees until the Central Valley Flood Protection Plan is completed in 2012. F2-11

Pages 2-24, 2-30, and 2-36: In the waterside vegetation removal section there is no mention of what may happen if a variance is not granted? F2-12

Page 2-68: In section 2.3.4.10 there is a discussion of landside vegetation mitigation. This section should also include a discussion on waterside vegetation mitigation. F2-13

Page 3-1 and 3-43: Should be "American and Sacramento rivers" not "American and Sacramento Rivers" F2-14

Page 3-46: Last sentenee has Paeific ehorus frog and bullfrog listed as reptiles. F2-15

Page 4.7-8: In the Temporal Loss of Landside and Waterside Woodland Habitats section there is no mention of utilizing the current California Central Valley Flood System Improvement Framework that guides vegetation along levees. Realizing that construction related to Phase 4b F2-16

will not occur until 2012 or later, this is when the Central Valley Flood Protection Plan will completed and will provide guidance on levee vegetation issues. These guidance documents should be mentioned and cited in the text. F2-16 (Con't.)

Page 4.7-8: Towards the bottom of the page the following is stated, "if habitat creation/preservation is not effectively implemented, the long-term loss of woodlands (including Heritage oaks) would result in a **potentially significant** impact." There should be an explanation as to why there is potential for the habitat creation and preservation to not be effectively implemented. The project proponent should ensure that the habitat creation and preservation is effectively done. F2-17

Page 4.7-11: Utilization of the SAM should be mentioned as part of the Mitigation Measure 4.7-a. Prior to and during the process of any construction as part of Phase 4b Project that impacts waterside vegetation, NMFS recommends that you use the SAM to evaluate the response to habitat features affected by various construction activities. SAM has been used at numerous levee sites along the mainstem Sacramento River and tributaries. F2-18

POST-AUTHORIZATION CHANGE REPORT AND INTERIM GENERAL REEVALUATION REPORT

Page PAC-7: The paragraph starting with "The original project…" is confusing and has grammatical errors.

Page PAC-10: The term MCACES is used in footnote 1. There is no explanation or definition of MCACES. This term is also used later in the document with no explanation.

Page PAC-11: There is no explanation for Table 7 in the text.

Page 1-3: Under heading "d" there is a floating quotation sign.

Page 1-4 and throughout document: Under heading "a" the text reads "Sacramento and American Rivers". It should be "Sacramento and American rivers". Same logic applies where the text reads "Feather, Yuba and American Rivers", should be "Feather, Yuba and American rivers". Make appropriate edits throughout entire document. F2-19

Page 2-11: Table 2-1 should be described in the main text.

Page 2-14: The document should include that obtaining a variance to maintain the levee vegetation would satisfy requirements of the ETL. The document correctly identifies the Framework and that it will expire in 2012. However, the document should include a description on how in 2012 there will be a new levee guidance document as part of the Central Valley Flood Protection Plan.

Page 2-15: For consistency, "Floodplains" under heading (7) should be underlined.

Page 2-16: Table 2-3 should be described in the text.

Page 2-17: Table 2-4 should be described in the text.

Page 2-20: In section 2-5 Planning Constraints, Central Valley steelhead should be included in bullet number 2.

Pages 2-24, 2-25, and 2-26: Tables 2-7, 2-8, 2-9, and 2-10 are incorrectly numbered and not properly described in the text.

Page 2-27: Figure 7B-1 is cited twice. It is unclear what this figure is and where it is located.

Page 2-27: No explanation for the basis for using of three flood events as the threshold for people to abandon Natomas Basin.

Page 3-9: Under heading "e. Vegetation and Encroachments", the text should describe that a vegetation variance could be obtained to satisfy the levee requirements under the ETL. To state that "complete removal of vegetation..." is necessary to fulfill the ETL is false.

F2-19 (Con't.)

Page 3-15: Table 3-5 is not described in the text.

Page 3-19: The following is found in the text, "compliance with the vegetation ETL will require that vegetation is removed from the levee." This is false, obtaining a vegetation variance will also comply with the ETL and this should be discussed as a viable alternative.

Page 3-27: Table 3-14 fails to mention that obtaining a variance is another method of complying with the ETL.

Page 3-34. The second sentence in the first full paragraph is incomplete.

Page 4-35: In Table 4-8 under the State section, CEQA should be listed.

Page 4-42: In Table 4-9 under the NMFS agency row, the Permit/Authorization/Approval text appears to be incorrect.

Page 7-1: The term "I" is used to initiate Chapter 7. Confusing as to who or what the "I" is? The final document should clarify.

This documents NMFS comments on the Phase 4b Project draft EIS/EIR and the Natomas PACR. NMFS comments to the draft EIS/EIR and Natomas PACR are intended to help guide the development of the final EIS/EIR and future ESA consultations.

If you have any questions regarding this correspondence please contact Mike Hendrick by telephone at (916) 930-3605 or by e-mail at Michael.Hendrick@noaa.gov.

Sincerely,

Maria Rea
Central Valley Office Supervisor

cc: Copy to file – ARN 2009SA00179
NMFS-PRD, Long Beach, California

Letter	United States Department of Commerce, National Oceanic and Atmospheric Administration,
F2	National Marine Fisheries Service, Sacramento Area Office
Response	Maria Rea, Central Valley Office Supervisor August 9, 2010

F2-1 Comment noted.

F2-2 As stated in Section 2.1.3.4, "Management of Levee Vegetation and Structural Encroachments," under the subheading "Vegetation Variance Request" of the DEIS/DEIR, SAFCA and CVFPB sought a vegetation variance from the standard vegetation guidelines set forth in USACE's Engineering Technical Letter 1110-2-571. This section has been updated in the FEIS/FEIR to reflect the fact that USACE granted the variance request in June 2010, and vegetation will be allowed to remain on a portion of the waterside slope and berm of several of the levee segments comprising the perimeter levee system protecting the Natomas Basin, except the lower 1/3 of the slope of the Natomas East Main Drainage Canal (NEMDC) where trees must be removed to comply with USACE levee vegetation guidance. Discussion of the Central Valley Flood System Improvement Framework and the Central Valley Flood Protection Plan was also added to this section. It is SAFCA's and USACE's intent that the habitat creation and preservation that is part of the Phase 4b Project and/or part of the mitigation measures identified for the Phase 4b Project would be successfully implemented.

The aforementioned DEIS/DEIR text is revised as follows:

> During preparation of the DEIS/DEIR, SAFCA and the Central Valley Flood Protection Board (CVFPB), the non-Federal sponsors of the NLIP, ~~are requesting~~ requested a variance from the standard vegetation guidelines set forth in USACE's Engineering Technical Letter 1110-2-571 (USACE 2009a). The *CVFPB and SAFCA Vegetation Variance for the Common Features (Natomas Basin) Project, Post-Authorization Change Report* (also referred herein as "vegetation variance") was developed to comply with applicable provisions of the California Central Valley Flood System Improvement Framework that was adopted by the California Levees Roundtable on March 26, 2009 (Framework). The Framework specifically states that where, as in the case of the Phase 4b Project, major modifications of existing levee sections are required, such modifications:
>
> > ...will comply with the [USACE] levee vegetation standards, but may allow vegetation to remain if these projects can demonstrate that the public safety risks posed to levee integrity have been adequately addressed and engineered into project designs.
>
> The Framework is to be used as a guide for vegetation on levees until the Central Valley Flood Protection Plan is completed in 2012.
>
> The vegetation variance request was granted by USACE in June 2010~~Under this variance~~, and vegetation will be allowed to remain on a portion of the waterside slope and berm of several of the levee segments comprising the perimeter levee system protecting the Natomas Basin, except the lower 1/3 of the slope of the NEMDC where trees must be removed to comply with USACE levee vegetation guidance. Although the variance was granted, this FEIS/FEIR retains the original scenarios presented in the DEIS/DEIR, which include both a with- and without-variance outcome to show the full range of potential adverse effects, including the worst-case scenario, as required under NEPA.

> The following sections describe the levee segments that ~~would be~~ are covered by this variance. Sections 2.3, "Proposed Action," and 2.4, "Fix-in-Place Alternative," describe the vegetation removal assumptions used by this EIS/EIR to provide environmental analysis to support consideration of this variance request.

The Natomas Post-Authorization Change Report (PACR) has been updated to reflect approval of the *CVFPB and SAFCA Vegetation Variance for the Common Features (Natomas Basin) Project, Post-Authorization Change Report* (also referred herein as "vegetation variance"), and the approval memo has been added as Appendix I of the Natomas PACR.

F2-3 The commenter recommends that prior to and during the process of construction, as part of the Phase 4b Project components that would affect waterside vegetation, the project proponent(s) should use the Standard Assessment Methodology (SAM) to evaluate habitat features affected by bank protection projects. As stated in the comment, SAM is a modeling tool that evaluates bank protection alternatives affecting threatened and endangered fish species. By identifying the response of fish species to habitat conditions over time, SAM users can determine necessary measures to avoid, minimize, or fully compensate for fish impacts for various life stages.

The comment does not question the analysis or conclusions in the DEIS/DEIR, rather, it recommends the use of a particular methodology (namely, SAM) to analyze impacts to the waterside vegetation. Section 4.7, "Biological Resources," of the DEIS/DEIR analyzes potential impacts to waterside vegetation that could result from implementation of the Phase 4b Project (see Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Habitats"). The analysis includes two different scenarios for the Phase 4b Project, one that assumes implementation of USACE's levee encroachment policy without a vegetation variance and another that assumes the vegetation variance would be granted. See response to comment F2-2.

The analysis of impacts identified both temporal and long-term losses of landside and waterside woodlands. As described in Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code," in the DEIS/DEIR, the project proponent(s) shall be required to further avoid and minimize potential impacts to the extent feasible, compensate for any tree/woodland removal on a no-net-loss basis, and obtain and comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code. The analysis found that habitat improvements from mitigation implementation would reduce long-term impacts to waterside woodland habitats loss to a less-than-significant level; however, this impact would remain significant and unavoidable for many years before reaching a less-than-significant level because replacement plantings would require a minimum of 10–15 years before providing important habitat components such as shade and structure and decades to replace older, more mature trees.

Because the impacts to waterside vegetation are relatively small, localized, and have been avoided and/or minimized to a large extent; mitigation measures will ensure no net loss (in the long-term); and consultation with resource agencies, including the National Marine Fisheries Service (NMFS) is underway, the use of the SAM model is not necessary to quantify impacts and/or determine if mitigation is commensurate.

F2-4 Residual flood risk is discussed in Section 2.7, "Residual Risk of Flooding," of the DEIS/DEIR.

F2-5 Comment noted.

F2-6 "NALP" is correct. The "Acronyms and Abbreviations" section is revised as follows:

...

NHPA	National Historic Preservation Act
~~NLAP~~	~~North Area Local Project~~
NLIP	Natomas Levee Improvement Program

...

F2-7 The first paragraph in Section ES.6, "Project Background and Phasing," of the DEIS/DEIR is revised as follows:

> As stated above, the overall purpose of the multi-phase NLIP is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The Phase 4b Project is the final phase of the NLIP Landside Improvements Project, and consists of improvements to the remaining portions of the Natomas Basin's perimeter levee system in the City of Sacramento and in Sutter and Sacramento ~~Counties~~ counties, California, associated landscape and irrigation/drainage infrastructure modifications, and habitat creation and management.

F2-8 In the paragraph beginning, "In January 2008..." on page ES-7 of the DEIS/DEIR, the second sentence provides the definition for AE zone: "FEMA defines AE zones as areas with a 0.01 AEP of flooding."

F2-9 See Section 1.1.1.1, "Relationship between the Federal interest and the Locally Preferred Plan," of the Phase 4b DEIS/DEIR.

F2-10 The first paragraph under the subheading, "Riverbank Erosion," in Section 1.4.2.1, "Flood Problems and Needs," of the DEIS/DEIR is revised as follows:

> As shown in **Plate 1-5**, ~~approximately~~ 15 sites along the waterside of the Sacramento River east levee are subject to bank erosion in the form of bed or toe scour and wave wash that threatens the stability of the adjacent levee. Risk priorities have been assigned to the affected sites based primarily on the risk of slope failure due to undermining. High-risk sites exhibit one or more of the following characteristics and are considered potentially susceptible to failure in a 100-year flood event...

F2-11 It is recognized that the Framework was used to shape the vegetation variance process. A variance was obtained and is included in Appendix I of the Natomas PACR.

F2-12 The last sentence of the last paragraph of Section 2.3.3.2, "Waterside Vegetation Removal," of the DEIS/DEIR states that if the vegetation variance is not granted, vegetation with stem widths that have a diameter at breast height (dbh) greater than two inches would be cleared within 15 feet of the waterside levee toe. Table 4.7-2 in the DEIS/DEIR shows the estimated acreages of vegetation that would be removed with and without the approval of the vegetation variance.

F2-13 The Phase 4b Project has been designed to accommodate waterside vegetation and address the risk of levee instability by enlarging the footprint of the levees protecting the Natomas Basin. The intent of the project is to minimize or avoid impacts on waterside vegetation. The majority of the vegetation removal that will occur as a result of project construction is on the landside of the

levees. Thus, the referenced paragraph in Section 2.3.4.10, "Vegetation Management," in the DEIS/DEIR references landside vegetation mitigation. Waterside vegetation mitigation is included in Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code," in Section 4.7, "Biological Resources," of the DEIS/DEIR.

F2-14 Comment noted. No changes made to the DEIS/DEIR.

F2-15 The first paragraph under the subheading, "Wildlife," in Section 3.7.2.1, "General Biological Resources," of the DEIS/DEIR is revised as follows:

> Before European settlement, the Sacramento area floodplains supported a wide variety and large numbers of wildlife species associated with its riparian habitats, permanent and seasonal wetlands, and oak woodlands and savannas. Much of this habitat has been lost, locally and regionally. Initially, land within the Natomas Basin was converted to agriculture, though more recent land use conversions have been to urban development. As a result, there have been shifts in wildlife use as land uses and habitats have changed. With the conversion to agriculture, the abundance of species restricted to natural habitats likely decreased, and in some cases particular species ceased to occur (City of Sacramento, Sutter County, and TNBC 2003). However, remnant native habitat patches and created habitat associated with drainage and agricultural supply ditches and habitat reserves have allowed remnant wildlife populations to persist within the Natomas Basin. Wildlife species common within the Natomas Basin include black-tailed jackrabbit, Audubon's cottontail, raccoon, striped skunk, California ground squirrel, mule deer, coyote, and river otter. Reptile species that are routinely encountered in the Natomas Basin include gopher snake, common garter snake, and racer snake.~~,~~ Amphibian species that are routinely encountered in the Natomas Basin include Pacific chorus frog~~,~~ and bullfrog.

F2-16 See responses to comments F2-2 and F2-11.

F2-17 USACE's and SAFCA's intent is certainly to implement habitat creation and preservation effectively. However, this is not a certainty. The impact analysis and conclusion contained in the DEIS/DEIR attempt to be conservative in disclosing that if habitat creation and preservation is not implemented effectively, a potentially significant impact would result. Further, under the California Environmental Quality Act (CEQA) (State CEQA Guidelines, California Code of Regulations [CCR] Section 15126.4[a][3]), mitigation can only be required for significant and potentially significant impacts. Thus, the impact must at least be potentially significant to warrant mitigation.

F2-18 See response to comment F2-3.

F2-19 This comment pertains to the Natomas PACR. See Appendix A of the Natomas PACR for response.

F3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

August 16, 2010

Ms. Elizabeth Holland
Environmental Resources Branch
U.S. Army Corps of Engineers
Sacramento District
1325 J Street, 10th Floor
Sacramento, California 95814-2922

Subject: Draft Environmental Impact Statement (DEIS) for the Natomas Levee Improvement Program Phase 4b Landside Improvements Project (CEQ# 20100240)

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

F3-1

While we acknowledge the flood protection benefits of the proposed action for the current residents of the Natomas Basin, we have rated the DEIS as Environmental Concerns – Insufficient Information (EC-2, see enclosed "*Summary of Rating Definitions*") due to our concerns about air quality and indirect and induced growth.

EPA's primary concern regarding the subject DEIS is the applicability of conformity requirements under the Clean Air Act. We noted in our March 22, 2010 comments on the FEIS for Phase 4a of the Natomas Levee Improvement Project (NLIP) that "the State of California has requested, and EPA has proposed, a "severe" classification for this ozone nonattainment area." EPA finalized the severe classification, effective June 4, 2010. Because the Record of Decision (ROD) for Phase 4a was not certified before the effective date of the reclassification, the new conformity thresholds now apply to Phase 4a. Based on the FEIS, Phase 4a would exceed the recently reduced conformity threshold for 2011. Once conformity applies to a project, it applies to the entire project; thus, the applicability of conformity to Phase 4a would affect Phase 4b, as well.

F3-2

EPA staff discussed the conformity issue with you and a Corps' contractor in several phone conversations. Following that, you provided a revised table of emissions in an email to Tom Kelly, of my staff, on August 11, 2010. The table reflects a revised construction schedule with additional reduction of nitrogen oxide emissions, from 20% to 40%. Based on that revised table, the Phase 4a emissions no longer appear to exceed the conformity threshold. If the Corps intends to pursue this revised construction schedule, commitments to do so should be included in the ROD for Phase 4a and in the FEIS and ROD for Phase 4b. If the Corps does not intend to pursue this revised construction schedule, the RODs and Phase 4b FEIS should address how conformity requirements will be met.

We appreciate the opportunity to review this DEIS. When the FEIS is released for public review, please send one hard copy and one CD ROM to the address above (mail code: CED-2). If you have any questions, please contact Tom Kelly, the lead reviewer for this project, at (415) 972-3856 or kelly.thomasp@epa.gov, or me at (415) 972-3521. F3-3

Sincerely,

Tom Kelly

for Kathleen M. Goforth, Manager
Environmental Review Office

Enclosures:
Summary of EPA Rating Definitions
Detailed Comments

cc: Jennifer Hobbs, U.S. Fish and wildlife Service
Mike Hendrick, National Marine Fisheries Service
Robert Solecki, Central Valley Regional Water Quality Control Board
Jeff Drongesen, California Department of Fish and Game
John Bassett, Sacramento Area Flood Control Agency
Helen Thomson, Sacramento Area Council of Governments
Karen Huss, Sacramento Metropolitan Air Quality Management District
David A. Valler Jr., Feather River Air Quality Management District
John Roberts, The Natomas Basin Conservancy

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

F3-1 (Con't.)

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

Air Quality

The DEIS discusses the applicability of general conformity in Impact 4.11-b. For the proposed alternative, the DEIS states, "[w]ith mitigation, worst-case maximum annual emissions are below the *de minimis* [stat] thresholds and therefore would conform with the applicable SIP regional attainment goals (See Appendix F for detailed emission sources and assumptions)" (p.4-17). EPA does not agree with this conclusion. The general conformity thresholds for Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) were reduced, effective June 4, 2010 (75 FR 24409, May 5, 2010,), as noted in the DEIS, Table 4.11-4 and Appendix F. Since the Corps did not sign the ROD for Phase 4A prior to that date (p. ES-6), the new conformity limits apply to Phase 4a as well as 4b. Phase 4A emissions, described in Appendix F, exceed the current 25 tons per year general conformity threshold for NOx. Once conformity applies to a project, it is applicable to the entire project. So, if conformity applies to Phase 4A, it also applies to Phase 4B, regardless of the level of 4B emissions.

EPA staff raised this to the attention of the Corps and its contractor in several phone conversations. The Corps subsequently provided an alternative Table 21 that spread Phase 4a construction into 2012, and reduced NOx emissions, by 40%, to below the conformity threshold. Your contractor's message[1] clarified that the reduced emissions will be achieved through vehicle emission controls, not emission credits or off-sets purchased from a local air district. The table also reflected other schedule changes for Phase 4b. F3-4

The revised table also showed reduced emissions for 2009 and 2010. Because 2009 is past and 2010 is more than half over, it is not clear how these emissions could be reduced.

Table 21 and Table 22, from Appendix F, contain differing emission estimates for 2010 and 2011. The Corps contractor clarified[2] that "the emission levels shown in Table 22 in Appendix F were not used in the analysis and should be considered extraneous."

We also note the wording "would conform with the applicable SIP" (p. 4.11-17) is inappropriate. Such wording should be used only if the Corps is making an affirmative determination that the project conforms to the applicable SIP, pursuant to analysis showing that the project's emissions will be over the de minimis applicability threshold.

[1] "In Case You Were Interested" Message to Tom Kelly (EPA) from Gregory Wolffe (AECOM). 12 August 2010. Email.
[2] "Conference Call This Afternoon Re: Natomas." Message to John Kelly (EPA) from Gregory Wolffe (AECOM). 29 July 2010. E-mail.

Recommendation:
The FEIS should describe and commit to project changes that reduce emissions below the general conformity applicability threshold. If the Corps will rely on extension of the project schedule, in accordance with the alternative Table 21 provided to EPA, that table and any supporting information should be included in the Phase 4a and 4b RODs and the Phase 4b FEIS.

Alternatively, the FEIS could include a conformity determination that includes both Phase 4a and 4b.

F3-4 (Con't.)

The FEIS should remove Table 22 from Appendix F.

The FEIS should include a footnote for Table 21, in Appendix F , explaining that 2010 air emissions, from Phase 3 of the project, were included in the phase 3 FEIS which was relied upon in the phase 3 ROD, prior to the conformity limit change from 50 to 25 tons per year. Therefore, 50 tons per year was the correct general conformity applicability threshold to apply to Phase 3 for VOC and NOx.

Indirect and Growth Inducing Impacts

While the levees have been in place since 1915 (Table 1-2), currently the Natomas Basin (Basin) is subject to a building moratorium (p. 3-21). Without improvement of the levees, further development within the Basin will continue to be limited by the moratorium. The DEIS describes planned growth within the Natomas Basin of 60,000 dwellings and associated commercial and residential developments over the next two decades (p.2-81). The increase in emission of criteria pollutants from this development can cause health problems and further delay attainment of air quality standards set by the Clean Air Act.

The DEIS describes a regional blueprint for future growth in the Sacramento area, including the Natomas Basin, adopted by the Sacramento Area Council of Governments (SACOG) and Valley Vision (p. 2-16). EPA commends the Corps and Sacramento Area Flood Control Agency (SAFCA) for including the blueprint, a "unique regional visioning project . . . bringing smart growth principles . . . to growth projected in the Sacramento Region until 2050[3]." EPA supports this effort for the people of the Sacramento area to "spend less time in their cars, spend less money on gas, and protect our air quality while improving our overall quality of life," and we acknowledge the greenhouse gas benefits of the development recommended by the blueprint. Unfortunately, the DEIS does not commit to ensuring that future growth in the Basin is consistent with the blueprint.

F3-5

The DEIS ultimately concludes, "the Phase 4b Project, while accommodating planned regional growth, is not growth inducing itself" (p.5-37). This distinction (accommodating growth vs. inducing growth) does not exist in NEPA regulations. Because the levee improvements will allow future growth in the basin, which is not currently allowed, the project will induce growth.

[3] "Blueprint Then/Now/Next." *Sacramento Region Blueprint*. Sacramento Council of Governments, n.d. Web. 23 July 2010. <http://www.sacregionblueprint.org>.

Furthermore, SAFCA's reliance on development fees implies that growth in the Natomas Basin may be critical to funding future flood protection efforts. The DEIS explains (p. 2-81) that SAFCA will use development fees to fund activities that appear unrelated to development: waterside levee strengthening, landside levee strengthening, acquisition of agricultural easements (outside the basin), and improved system operations. The development impact fee applies to "all new structures placed anywhere in the 200-year (0.005 AEP) floodplain of SAFCA's capital assessment district." This implies the fee will be collected from many locations within SAFCA's jurisdiction. Yet, the vast majority of the remaining land to be developed appears within the 200-year floodplain appears to be located in the Natomas Basin, based on the SAFCA Boundary Map.

While the DEIS frequently notes the project is intended provide flood protection to current residents and property, the income generated from development fees appears to be a critical piece to ensuring adequate flood control protection remains in place. This further establishes growth inducement and future development as indirect impacts of the Natomas Levee Improvement Project.

F3-5 (Con't.)

The DEIS states that the City of Sacramento, Sacramento County, and Sutter County, which comprise three fifths of the organizations that comprise SAFCA, have developed general plans that provide a framework for growth and development within their jurisdictions. The DEIS does not state whether or not these plans are consistent with the blueprint. Several reports have documented that development fees are a significant revenue source for local governments[4]. The City and County of Sacramento have even developed a revenue sharing agreement for development in the Natomas Basin[5]. Like SAFCA, these entities are reliant on future development in the Natomas Basin to reduce future financial shortfalls.

EPA does not oppose development in the Natomas Basin, although we would advise against it in the deepest portions of the floodplain; however, we do think the FEIS should acknowledge that development is not incidental to the levee project, but an indirect and growth inducing impact of the project.

Recommendation:
The FEIS should describe all indirect and growth inducing impacts, including emissions of priority air pollutants and greenhouse gases from industrial, commercial, and residential development planned for the Natomas Basin.

[4] For example, "Pay to Play, Residential Development Fees in California Cities and Counties, 1999." California Department of Housing and Community Development. Web. August 11, 2010. <http://www.hcd.ca.gov/hpd/pay2play/fee_rpt.pdf>

[5] "Resolution No. 2002-830, Adopted by the Sacramento City Council on the date of December 10, 2002." Web. August 11, 2010. < http://www.msa2.saccounty.net/planning/Documents/Natomas%20Joint%20Vision/City-CountyMemorandumofUnderstanding.pdf>

To mitigate air pollution and traffic congestion from new housing, the FEIS should commit to ensuring future development in the Natomas Basin will be consistent with the SACOG and Valley Vision blueprint.

F3-5 (Con't.)

The FEIS should acknowledge that development fees are a necessary source of revenue to ensure future flood protection within SAFCA's jurisdiction.

Letter F3 Response	United States Environmental Protection Agency, Region IX Kathleen M. Goforth, Manager, Environmental Review Office August 16, 2010

F3-1 See responses to comments F3-2, F3-4, and F3-5.

F3-2 U.S. Environmental Protection Agency (EPA) General Conformity thresholds for volatile organic compounds (VOCs) and Nitrogen Dioxides (NO_X) for the Sacramento Metropolitan area were reduced from 50 tons per year (TPY) to 25 TPY, effective June 4, 2010. The reduced conformity threshold applies to the NLIP project phases beginning in 2011 through completion (projected to the year 2016). Revisions, including schedule adjustments and increased NO_X control efficiency (from 20% to 40%, based on contractor fleet requirements), have been incorporated into Section 4.11, "Air Quality," of the FEIS/FEIR and these adjustments provide demonstration that the NLIP (during 2011 through 2016) would achieve emissions below the reduced General Conformity threshold. Revisions to the tables in Sections 3.11, "Air Quality," and 4.11, Air Quality," of the DEIS/DEIR are shown in tracked changes in **Appendix F** of this FEIS/FEIR. Additionally, the air quality modeling has been updated and is included in **Appendix F** (Table 21).

F3-3 The FEIS/FEIR will be provided to EPA as well as all other commenters.

F3-4 See response to comment F3-2.

The achievement of 40% NO_X control, as proposed, would be demonstrated through newer model year contractor equipment that would be required by the project proponent(s). Based on contractor fleet inventories provided to the Sacramento Metropolitan Air Quality Management District (SMAQMD) pertaining to construction activities currently under way for previous NLIP project phases, contractor fleet inventories have typically shown a reduction of 60–65% compared to the California Air Resources Board (ARB) fleetwide average. Therefore, emissions during 2009 and 2010, based on actual fleet inventory data, are estimated to have achieved at least a 40% emissions reduction.

Table 22, which was originally included in **Appendix F** of the DEIS/DEIR was an extraneous table and has been removed from this FEIS/FEIR.

The second bullet under "Construction in Sacramento County (SMAQMD)," in Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} During Construction," of the DEIS/DEIR is revised as follows:

- If overlapping construction phases in Sacramento County create unmitigated PM_{10} emissions in excess of the General Conformity threshold, per SMAQMD Rule 104, of ~~400~~100 TPY, the project proponent(s) shall use advanced dust suppressant materials (such as EnviroTac II) on all unpaved roadways and stockpiled materials to ensure enhanced fugitive dust control up to 90% or greater ~~control of~~ fugitive dust and ~~a reduction of~~ PM_{10} emissions ~~below 100 TPY~~.

In addition, a second footnote is included in the revised Table 21 (in Appendix F of the DEIS/DEIR) as follows:

[1] Control efficiencies are based on implemented control measures, per SMAQMD CEQA Guidance: control efficiency for NO_X emissions is based on enhanced exhaust

control measures per SMAQMD CEQA Guidance, including submittal of contracted construction fleet inventories for demonstration of 20% control compared to the ARB fleetwide average, with an additional 20% reduction imposed by the project to meet general conformity.

[2] Emissions from Phase 3 were included in the Phase 3 FEIS, and were approved through the authorization of the Record of Decisions (ROD), prior to the conformity limit change from 50 TPY top 25 TPY. Therefore, 50 TPY is the correct General Conformity Threshold applicable to Phase 3 emissions of VOCs and NO_X.

F3-5 Growth-inducing impacts of the NLIP are discussed in Section 5.2, "Growth Inducement," of the DEIS/DEIR. As described in that section, population growth and urban development within the project area are driven by local, regional, and national economic conditions. Local land use decisions within the Phase 4b Project area are within the jurisdiction of the City of Sacramento. The City has adopted a general plan consistent with state law that provides an overall framework for growth and development within its jurisdiction, including the project area. Although the City is a member of SAFCA, as a joint powers agency, SAFCA is limited to exercising powers common to all of its constituent members, including Reclamation District 1000 (RD 1000) and the American River Flood Control District, neither of which has any land use planning authority. Accordingly, SAFCA has no authority to permit development and has only limited authority to impose conditions on the development that is permitted.

The Blueprint prepared by the Sacramento Area Council of Governments (SACOG) serves as a serve as a framework to guide local government in growth and transportation planning through 2050, however, compliance with the principles of the Blueprint are not mandatory for local land use planning agencies. Because the local land use planning authority rests with local agencies (City of Sacramento, Sacramento County, Sutter County), neither USACE nor SAFCA have authority to ensure that future growth is consistent with the Blueprint.

Neither USACE nor SAFCA have the authority to plan land uses or direct development within the Natomas Basin. When developing the Phase 4b Project, USACE and SAFCA considered the planned regional growth as projected by local land use planning agencies. The cumulative impacts of this planned growth have been addressed in environmental documents prepared by the local land use planning agencies. Thus, the Phase 4b Project is not growth-inducing itself.

SAFCA has adopted a development fee program to ensure that new development in the undeveloped areas in the Natomas Basin and lower American River areas would not substantially increase the expected damage of an uncontrolled flood. The fee program is based upon the creation of a new assessment district and a development fee program to fund various project-related activities. The assessment district encompasses the properties in the developed areas within SAFCA's jurisdictional boundary in Sacramento and Sutter Counties that specially benefit from the activities and improvements. (See Section 3.2.1, "Project Features," of the *Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area,* State Clearinghouse No. 2006072098).

TRIBAL GOVERNMENT

T1

SHINGLE SPRINGS RANCHERIA

Shingle Springs Band of Miwok Indians,
Shingle Springs Rancheria
(Verona Tract), California
5281 Honpie Road, Placerville, CA 95667
P.O. Box 1340, Shingle Springs, CA 95682
(530) 676-8010 Office, (530) 676-8033 Fax

July 21, 2010

Elizabeth Holland, Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

RE: Comments on the American River Watershed Post-Authorization Change Report & Interim General Reevaluation Report & the Draft EIS/Draft EIT on the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project

Dear: Ms. Holland

The Shingle Springs Band of Miwok Indians, ("Tribe"), has reviewed the American River Watershed Post-Authorization Change Report & Interim General Reevaluation Report & the Draft EIS/Drat EIT on the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project (the "Reports"). Thank you very much for the opportunity to comment. The Tribe commends the USACE & SAFCA officials and representatives for producing a plan that strives to balance the numerous interests of the Parties affected and the safety of the residents of the Sacramento Valley. By and large, the plan represents a great amount of thought and consideration towards the Tribe and associated cultural remains. However the Tribe has various concerns about the draft, in particular, omissions of certain Tribal interests and areas where interests could be articulated more precisely. T1-1

The majority of the document appears thoughtfully crafted and the Tribe believes that Tribal issues in general have been keenly addressed. The Tribe feels that the USACE & SAFCA has shown a commitment to ensuring inclusion, fair treatment, and equitable outcomes between the tribes, Sacramento residents, and flood prevention. Recognizing the outstanding work done to produce these Reports, the Tribe would like to submit comments as outlined in the enclosed chart.

*(**Note: The comments have been arranged in chart form by page number, and include the title of the section and the heading to which they correspond. Included in each comment is a recommended addition to the existing text or in some cases, a slight revision.)*

SAFCA '10 JUL 27 PM2:34

Conclusion

With these changes, the Tribe feels that the Reports will accurately represent the cooperative and equitable relationship that the USACE & SAFCA and Tribe envision. By accurately encompassing the cultural and communal welfare of the Tribe, the Reports can reflect the positive working relationship between tribes and the USACE & SAFCA.

Thank you for this opportunity to comment on USACE & SAFCA's work and the Tribe looks forward to continuing to be a part of USACE & SAFCA's process.

Very Truly Yours,

John Tayaba
Vice Chairperson
Most Likely Descendant

cc:
John Bassett, Director of Engineering
SAFCA
1007 7th Street, 7th Floor
Sacramento, CA 95814

Comment Chart

American River Watershed Post-Authorization Change Report & Interim General Reevaluation Report		
Page/ Section	Quote/section	Comment
1-5 (c.) 2nd paragraph lines 4 & 5	"…a group of Hudson Bay Company workers brought malaria to Natomas, and seventy-five percent of residents died."	Should say: "…seventy-five percent of local *Native Americans* died."
1-21 (10) paragraph 3 line 8	"…and/or protect the rights of Native Americans."	Should say:" …and/or protect the rights *and cultural resources* of Native Americans."
3-28 Table 3-15, Cultural Resources	"No long term effects will result from the project"	Issue: We believe that long term effects may result from the project if cultural resources must be removed/ and or damaged. Should Say: "Damage and permanent loss of some cultural resources may occur. Plan implements appropriate mitigation measures to minimize damage or loss."
3-33, 3-8 MITIGATION	Describes agencies that have included in coordination of mitigation	Issue: Does not mention local Native American Tribes. Should include: "*local Native American Tribes*."
4-43, Table 4-10-Costs of Potential Additional Increments	Total for Cultural Resource Preservation = 0 (zero)	Issue: This does not seem to be a realistic figure given the extensive amount of Cultural resources present along the river.
6-4, 6-6. Additional Required Coordination	Under Chapter 6 – Public Involvement, Review, and Consultation	Issue: Does not mention tribes or the NAHC Should Include: "NAHC" and "Local Tribes" as separate headings and say that consultation has been "on-going"
7-3, Chapter 7 – Recommendations (n.)	Comply with all applicable Federal and State laws and regulations, including but not limited to:	Issue: does not list NAGPRA as one of the laws. NAGPRA should be included. Should Include: "*NAGPRA*" in the laws listed.

T1-2

Draft EIS/Drat EIT on the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project		
Page/ Section	Quote/section	Comment
3.8 CUTURAL RESOURCES, 3-74 to 3-88; 4.8 Cultural Resources, 4.8-1	Testing	The Tribe would like consult in more detail where known cultural resources have been identified, in addition to having tribal monitors

T1-3

to4.8-13		present at all ground disturbing activity in the vicinity of the known site, including any testing. At sites where testing has not yet been performed, the Tribe would like to have testing at depths of at least 6 feet. When testing has been performed along the shore only, the Tribe would like testing to be done up through 150-200 yards from the shore, where impacts from the project are likely, so as to further mitigate potential damage. Also, the Tribe would like testing to be done at all borrow sites, before borrowing can begin.	T1-3 (Con't.)
4.8-7 Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative	Construction of the Phase 4b Project may affect two identified prehistoric archaeological deposits: NLIP-40, which consists of a newly identified prehistoric resource that occurs in the Fisherman's Lake Borrow Area...	Is there an alternative for borrowing from an area that does not contain cultural resources such as CA-Sac-18, and the site in the South Fisherman's Lake Borrow Area? The Tribe would like to see a reasonable effort made to Borrow from areas not containing cultural resources.	T1-4

Letter T1 Response	Shingle Springs Rancheria John Tayaba, Vice Chairperson, Most Likely Descendant July 21, 2010

T1-1 Comment noted.

T1-2 This comment pertains to the Natomas PACR. See Appendix A of the Natomas PACR for response.

T1-3 USACE will continue to consult with local tribes on known cultural resources that have been identified as affected by the NLIP, including the Phase 4b Project. Tribal monitors are not required by Federal law; however, Shingle Springs Rancheria or other local tribes or interested parties may provide monitors at their own cost as safety and construction permits. Surveying of the area of potential effects of the project area will occur prior to construction activities to determine the presence of potential cultural resources and determine the potential need for further testing to evaluate significance and effects. This may include limited shovel testing or auguring, where it is determined that ground cover or recent deposits would obscure cultural materials. This includes all non-commercial borrow sties before their use as borrow material. Commercial borrow sites will not be tested further as they will have already been required to comply with the National Historic Preservation Act.

T1-4 USACE will make good faith efforts to identify other sources of borrow material that do not include identified prehistoric or historic resources.

STATE AGENCIES

S1

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVE
CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Rm. 151
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682
PERMITS: (916) 574-0685 FAX: (916) 574-0682

RECEIVED
JUL 29 2010
STATE CLEARING HOUSE

July 27, 2010

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Bassett:

State Clearinghouse (SCH) Number: 2009112025
Draft Environmental Impact Report Natomas Post-Authorization Change Report/Natomas Levee Improvement Program, Phase 4b Project

Staff for the Central Valley Flood Protection Board has reviewed the subject document and provides the following comments:

The proposed project is located within the jurisdiction of the Central Valley Flood Protection Board. The Board is required to enforce standards for the construction, maintenance and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board's jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6); S1-1

- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);

- Vegetation plantings will require the submission of detailed design drawings; identification of vegetation type; plant and tree names (i.e. common name and scientific name); total number of each type of plant and tree; planting spacing and irrigation method that will be within the project area; a complete vegetative management plan for maintenance to prevent the interference with flood control, levee maintenance, inspection and flood fight procedures (Title 23, California Code of Regulations CCR Section 131).

Potential significant effects - According to the draft document p. 4.7 – 8 "The plan for compensation for impacts to landside woodland would include transplanting suitable trees from the Phase 4b Project area, where feasible, as well as planting a variety of native tree species to create woodland habitat. Potential sites for plantings to compensate for landside woodland impacts would include locations along Reach A:16 of the Sacramento River east levee, and along Lower Dry Creek, immediately east of the NEMDC."

In accordance with CCR, Section 131 "(c) Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures." The draft document does not include detailed planting and management plans for the proposed increase in woodland habitat of the Sacramento River east levee, and along Lower Dry Creek. As a result, potential significant hydrological impacts due to the woodland plantings included in the proposed project could not be determined. The draft document should provide additional analysis and evaluation of the potential impacts and mitigation measures reducing impacts to the operations and maintenance of the flood control system and to the system's functioning. S1-1 (Con't.)

The permit application and Title 23 CCR can be found on the Central Valley Flood Protection Board's website at http://www.cvfpb.ca.gov/. Contact your local, federal and state agencies, as other permits may apply.

If you have any questions please contact me at (916) 574-0651 or by email jherota@water.ca.gov.

Sincerely,

James Herota
Staff Environmental Scientist
Flood Projects Improvements Branch

cc:
Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Letter	State of California – The Resources Agency, Central Valley Flood Protection Board
S1	James Herota, Staff Environmental Scientist, Flood Projects Improvements Branch
Response	July 27, 2010

S1-1 Comment noted.

Impact 4.5-b, "Alteration of Local Drainage," in the DEIS/DEIR addresses impacts associated with woodland planting in Lower Dry Creek. Mitigation Measures 4.5-b(1), "Coordinate with Landowners and Drainage Infrastructure Operators, Prepare Final Drainage Studies as Needed, and Implement Proper Project Design," and 4.5-b(2), "Prepare Hydraulic Study, and Design and Implement Lower Dry Creek Woodland Panting Areas to Avoid Adverse Hydraulic Effects," in the DEIS/DEIR would reduce this impact to a less-than-significant level.

S2

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, Gover

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

PAUL D. THAYER, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
California Relay Service From TDD Phone 1-800-735-2929
from Voice Phone 1-800-735-2922

Contact Phone: (916) 574-1900
Contact FAX: (916) 574-1885

August 12, 2010

File Ref: SCH 2009112025

RECEIVED
AUG 16 2010
STATE CLEARING HOUSE

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Subject: Draft Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR) for the American River Watershed Common Features Project / Natomas Post-authorization Change Report / Natomas Levee Improvement Program, Phase 4b Landside Improvements Project

Dear Mr. Bassett:

The California State Lands Commission (CSLC) staff has reviewed the subject DEIS/DEIR dated July 2, 2010. For this project, the CSLC is a Trustee Agency and, depending on the final alternative selected, may also be a Responsible Agency.

As general background, the State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes of waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation and open space. The State owns sovereign fee title to tide and submerged lands landward to the mean high tide line (MHTL) as they existed in nature, prior to fill or artificial accretions. On navigable non-tidal waterways, the State holds fee ownership of the bed landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, as they last naturally existed. The State's sovereign interests are under the jurisdiction of the CSLC. S2-1

The current project is to address improving the 42 miles of flood protection levees for the Natomas Basin. The improvements will increase the level of flood protection to achieve a minimum of 200-year flood protection. Improvements to the levee system will result in disturbance and the potential loss of riparian habitat along sections of the proposed project. These changes, along with those proposed for the other levee system enhancements in the Sacramento Valley, will result in a cumulative loss of riparian vegetation and shaded riverine aquatic habitat along the river bank, which will be difficult to mitigate and may result in secondary impacts to the listed runs of salmonids and listed avian species. The CSLC recommends that the Sacramento Area Flood Control Agency work very closely with the California Department of Fish and S2-2

Game, U.S. Fish and Wildlife Service, NOAA Fisheries, and other applicable resources agencies, as well as with local representatives of adjoining landowners (such as the Sacramento River Conservation Area Forum), to address these cumulative impacts and to design appropriate mitigation/conservation areas. Other types of mitigation, such as avoidance, both in time and space (such as construction work windows), will also need to be considered. S2-2 (Con't.)

To the extent the proposed project involves State-owned sovereign lands including, but not limited to, the Sacramento River and the American River, a lease from the Commission will be required. Please contact Diane Jones at 916-574-1843 for information concerning our leasing requirements. If you have any questions concerning the environmental review, please contact Chris Huitt at (916) 574-1938 or by e-mail at huittc@slc.ca.gov. S2-3

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
D. Jones, CSLC
C. Huitt, CSLC

Letter	California State Lands Commission
S2	Cy R. Oggins, Chief, Division of Environmental Planning and Management
Response	August 12, 2010

S2-1 Comment noted.

S2-2 Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats," in the DEIS/DEIR addresses impacts associated with the loss of shaded riverine aquatic (SRA) habitat. Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act and Section 1602 of the California Fish and Game Code," in the DEIS/DEIR requires that the project proponent(s) consult with NMFS, under the Federal Endangered Species Act (ESA), and the California Department of Fish and Game (DFG), under the California Endangered Species Act (CESA), regarding potential impacts to the loss of SRA habitat on Federally and state-listed fish species, respectively. Implementation of measures developed under ESA Section 7 and CESA consultation will be designed to ensure no net loss of SRA habitat function.

Section 5.1.5.6, "Water Quality/Fisheries," under the subheading "Phase 4b Project: Fisheries," in the DEIS/DEIR concludes that, combined with previous channel alterations, the Phase 4b Project would result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to the loss of SRA habitat and woody debris.

S2-3 Comment noted. The project proponent(s) will meet the California State Lands Commission's leasing requirements, as necessary.

S3

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
2800 GATEWAY OAKS DRIVE, MS 19
SACRAMENTO, CA 95833
PHONE (916) 274-0635
FAX (916) 263-1796
TTY 711

Flex your power!
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August 17, 2010

032010SAC0037
03-SAC-99 PM VAR
American River Watershed Common Features Project Natomas Basin
Draft Environmental Impact Report
SCH# 2009112025

John Bassett, Director of Engineering
Sacramento Area Flood Control Agency (SAFCA)
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Bassett:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) for the American River Watershed Common Features Project/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project and the Draft Natomas Post-Authorization Change Report. This review of Phase 4b is a portion of the process required to upgrading the levees in the Natomas area as part of the Natomas Levee Improvement Program. Our comments are as follows:

- Caltrans Encroachment Permits will be required for levee improvements at the Interstate 5 (I-5) American River North Levee crossing and the Interstate 80 (I-80) crossings across Sacramento River East Levee as well as the Natomas East Main Drainage Canal South Levee. All work proposed and performed within the State Highway right-of-way must be in accordance with Caltrans' standards. For more information on encroachment permits, the requirements, and an application form, please visit our web page at www.dot.ca.gov/doingbusiness and then click on "Encroachment Permits" or contact the Caltrans District 3, Office of Permits at (530) 741-4403. S3-1

- Caltrans District 3 would appreciate the opportunity to review the plans for levee improvements at the highway crossings. S3-2

"Caltrans improves mobility across California"

- The American River North Levee and Sacramento River East Levee 3B run under bridge structures on piers. Please provide a list of they type of equipment to be used under the structures and the plans/procedures in place to prevent any damage to existing bridge piers. S3-3

- The North East Main Drainage Canal South Levee runs under the bridge across the canal in close proximity to the bridge abutments. Please provide plans for the levee improvements at this location for Caltrans review. S3-4

If you have any questions regarding these comments, please contact Sadie Smith at (530) 741-4004 or sadie_smith@dot.ca.gov.

Sincerely,

Alyssa Begley

ALYSSA BEGLEY, Chief
Office of Transportation Planning - South

"Caltrans improves mobility across California"

Letter S3 Response	State of California, Department of Transportation, District 3, Sacramento Area Office Alyssa Begley, Chief, Office of Transportation Planning – South August 17, 2010

S3-1 As noted in Section 1.7.2.2, "State Actions/Permits," of the DEIS/DEIR, a California Department of Transportation (Caltrans) encroachment permit is listed as a requirement for project implementation, as appropriate.

S3-2 USACE and/or SAFCA will coordinate with Caltrans District 3, as appropriate, to ensure appropriate Caltrans review and input is received regarding highway crossings and construction near bridge structures. Additionally, Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," in the DEIS/DEIR requires the preparation of a traffic safety and control plan as well as a Transportation Management Plan, both of which would be submitted to Caltrans for review.

S3-3 See response to comment S3-2.

S3-4 See response to comment S3-2.

S4

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cathleen Cox
Acting Director

August 17, 2010

John Bassett
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Subject: Common Features/Natomas PACR/Natomas Levee Improvement Program, Phase 4b Project
SCH#: 2009112025

Dear John Bassett:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on August 16, 2010, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

S4-1

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 · SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH#	2009112025
Project Title	Common Features/Natomas PACR/Natomas Levee Improvement Program, Phase 4b Project
Lead Agency	Sacramento Area Flood Control Agency
Type	EIR Draft EIR
Description	The overall purpose of the Natomas Levee Improvement Program (NLIP) is to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas. The Phase 4b - Project - a component of the NLIP - consists of improvements to the remaining portions of the Natomas Basin's perimeter levee system and associated landscape, irrigation/drainage infrastructure modifications, and environmental mitigation, including habitat creation and management.

Lead Agency Contact

Name	John Bassett		
Agency	Sacramento Area Flood Control Agency		
Phone	(916) 874-7606	***Fax***	
email			
Address	1007 7th Street, 7th Floor		
City	Sacramento	***State*** CA ***Zip*** 95814	

Project Location

County	Sacramento, Sutter		
City	Sacramento		
Region			
Lat / Long	38° 41' N / 121° 36' W		
Cross Streets	Various		
Parcel No.			
Township	***Range***	***Section***	***Base***

Proximity to:

Highways	Hwy 5, 99, 80
Airports	Sacramento Int'l
Railways	
Waterways	Sacramento & American Rivers, NCC, NEMDC, PGCC
Schools	
Land Use	Various, including flood damage reduction facilities, agriculture, residential, and public right-of-way.

Project Issues Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Economics/Jobs; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects; Aesthetic/Visual

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Game, Region 2; Office of Historic Preservation; Department of Parks and Recreation; Central Valley Flood Protection Board; California Highway Patrol; Caltrans, District 3; Regional Water Quality Control Bd., Region 5 (Sacramento); Native American Heritage Commission; State Lands Commission; Department of Water Resources

Date Received 07/01/2010 ***Start of Review*** 07/01/2010 ***End of Review*** 08/16/2010

Note: Blanks in data fields result from insufficient information provided by lead agency.

Letter	Governor's Office of Planning and Research
S4	Scott Morgan, Director, State Clearinghouse
Response	August 17, 2010

S4-1 Comment noted.

LOCAL AGENCIES

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

L1

August 2, 2010

Mr. John Bassett
Director of Engineering
SAFCA
1007 Seventh Street, 7th Floor
Sacramento, CA 95814

Ms. Elizabeth Holland
Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

American River Watershed Common Features Project, Natomas Levee Improvement Program (NLIP), Phase 4b Landside Improvements Project DEIS/DEIR (SAC200701184f)

Dear Mr. Bassett and Ms. Holland:

Thank you for providing the NLIP Phase 4b Landside Improvements Project DEIS/DEIR to the Sacramento Metropolitan Air Quality Management District (SMAQMD) for review. SMAQMD staff comments follow.

1. Please provide the analysis justifying the statement that a dust control plan has been developed that will "effectively reduce mass PM10 emissions below the concentration based threshold" (page 4.11-6, paragraph 2). Has modeling been performed to show concentrations below the 5% substantial contribution in non-attainment areas? L1-1
2. Why was the level of 400 tons/year of PM10 selected as a trigger to include the use of advanced dust suppression materials (page 4.11-14, last bullet)? L1-2
3. Would the application of advanced dust suppression materials reduce PM10 emissions from 400 to 100 tons/year (page 4.11-14, last bullet)? L1-3
4. The SMAQMD prefers that an estimated mitigation fee be disclosed in the DEIS/DEIR based on the emissions estimates and mitigation measures provided in the document (page 4.11-15, 4th bullet). L1-4
5. Because there is concern in the construction industry regarding the safe operation of off-road equipment with a diesel particulate filter (DPF) that blocks driver visibility, the SMAQMD suggests an alternative mitigation be available to the 15% DPF installation for off-road equipment. SMAQMD has determined that an additional 20% reduction in project-wide fleet average particulate emissions would be beneficial, which brings the total particulate emission reduction to 65% compared to the state fleet average (page 4.11-16, last bullet). L1-5
6. SMAQMD suggests adding the word "not" in the 3rd to last sentence of the first paragraph on page 4.11-23, regarding exposing sensitive receptors to substantial concentrations of Toxic Air Contaminants. L1-6

777 12th Street, 3rd Floor ▪ Sacramento, CA 95814-1908
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www.airquality.org

7. Overall, the climate change and greenhouse gas discussion and analysis were done well (section 5.1.5.12). L1-7
8. The listing of potential greenhouse gas mitigation measures on page 5-22 should be referenced in Table ES-2, Summary of Impacts and Mitigation Measures, and/or another obvious place in the DEIS/EIR that future contractors will reference for project construction requirements. L1-8

All projects are subject to SMAQMD rules in effect at the time of construction. Attached is a list of rules that may apply to this project. For more information on SMAQMD rules call 916-874-4800 or visit www.AirQuality.org. L1-9

Please contact me at 916-874-4881 or khuss@airquality.org if you have any questions regarding these comments.

Sincerely,

Karen Huss

Karen Huss
Associate Air Quality Planner/Analyst

Attachment

Cc: Larry Robinson, Sacramento Metropolitan Air Quality Management District
Sondra Andersson, Feather River Air Quality Management District

SMAQMD Rules & Regulations Statement (revised 1/07)

*The following statement is recommended as standard condition of approval or construction document language for **all** development projects within the Sacramento Metropolitan Air Quality Management District (SMAQMD):*

All projects are subject to SMAQMD rules and regulations in effect at the time of construction. A complete listing of current rules is available at www.airquality.org or by calling 916.874.4800. Specific rules that may relate to construction activities or building design may include, but are not limited to:

Rule 201: General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permit(s) from SMAQMD prior to equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact the District early to determine if a permit is required, and to begin the permit application process. Portable construction equipment (e.g. generators, compressors, pile drivers, lighting equipment, etc) with an internal combustion engine over 50 horsepower are required to have a SMAQMD permit or a California Air Resources Board portable equipment registration. L1-9 (Con't.)

Other general types of uses that require a permit include dry cleaners, gasoline stations, spray booths, and operations that generate airborne particulate emissions.

Rule 403: Fugitive Dust. The developer or contractor is required to control dust emissions from earth moving activities or any other construction activity to prevent airborne dust from leaving the project site.

Rule 417: Wood Burning Appliances. Effective October 26, 2007, this rule prohibits the installation of any new, permanently installed, indoor or outdoor, uncontrolled fireplaces in new or existing developments.

Rule 442: Architectural Coatings. The developer or contractor is required to use coatings that comply with the volatile organic compound content limits specified in the rule.

Rule 902: Asbestos. The developer or contractor is required to notify SMAQMD of any regulated renovation or demolition activity. Rule 902 contains specific requirements for surveying, notification, removal, and disposal of asbestos containing material.

Letter	Sacramento Metropolitan Air Quality Management District
L1	Karen Huss, Associate Air Quality Planner/Analyst
Response	August 2, 2010

L1-1 Emissions modeling was conducted to evaluate potential air quality impacts from emissions of particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}), using emission factors derived from the SMAQMD Road Construction Model, Versions 6.3.2. as well as EPA's AP-42 factors for bulldozing and haul transport on paved and unpaved roads. A Fugitive Dust Control Plan would be developed by the construction contractor(s) and will include enhanced fugitive dust control measures, as recommended by SMAQMD. Therefore, dispersion modeling has not been conducted for this air quality analysis. Upon further request, significance determination can be demonstrated using supporting dispersion modeling outcomes.

L1-2 SMAQMD notes that 400 tons per year of PM_{10} appears to have been selected as a trigger for implementation of advanced dust suppression technologies. This is a typographical error. The trigger for use of advanced suppression or chemical stabilizers is 100 tons per year, consistent with the threshold established per SMAQMD Rule 104 as well as EPA's General Conformity Rule.

The second bullet under the subheading, "Construction in Sacramento County (SMAQMD)," under Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction," of the DEIS/DEIR has been modified as follows:

- If overlapping construction phases in Sacramento County create unmitigated PM_{10} emissions in excess of the General Conformity threshold, per SMAQMD Rule 104, of ~~400~~ 100 TPY, the project proponent(s) shall use advanced dust suppressant materials (such as EnviroTac II) on all unpaved roadways and stockpiled materials to ensure enhanced fugitive dust control up to 90% or greater ~~control~~ of fugitive dust and ~~a reduction of~~ PM_{10} emissions ~~below 100 TPY~~.

L1-3 See response to comment L1-2.

L1-4 The total estimated fee, including a 5% administrative fee, for Phase 4b Project elements occurring during the 2012 through 2016 construction seasons within Sacramento County would be $222,936. Detailed fee calculations for fees to be paid to SMAQMD, by proposed construction year, are presented in **Appendix F**, Table 22, of this FEIS/FEIR.

The last bullet of Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction," of the DEIS/DEIR is revised as follows:

- The project proponent(s) shall pay ~~SMAQMD's off-site construction mitigation fund to further mitigate construction-generated emissions of NO_x that exceed SMAQMD's daily emission threshold of 85 lb/day, for the purpose of reducing impacts to a less-than-significant level. The total mitigation fee for project-related work conducted in Sacramento County during the 2012-2016 construction seasons will be quantified in coordination with SMAQMD using equipment inventories provided by the project proponent(s) prior to construction. Calculation of fees associated with the Phase 4b Project shall be conducted at the time of project approval. The applicable fee rate shall be determined and the total fee shall be calculated based on the fee rate in effect~~

~~at the time of project approval. The fee shall be remitted to SMAQMD before groundbreaking.~~ SMAQMD an off-site mitigation fee for implementation of any proposed alternatives for the purpose of reducing NO_X emissions impacts to a less-than-significant level. Based on the construction information presented in Chapter 2.0, "Alternatives" and the emissions calculations shown in **Appendix F**, if the Proposed Action is implemented, the total estimated fee, including a 5% administrative fee, for elements occurring during the 2012 through 2016 construction seasons within Sacramento County would be $222,936. The fee calculation to offset daily NO_X emissions is based on the cost to reduce 1 ton of NO_X at the time when the document is prepared (currently $16,400 per ton). An initial payment, based on 50% of the estimated fee, shall be remitted to SMAQMD before groundbreaking. The final mitigation fee shall be based on contractor equipment inventories provided by the project proponent(s) to SMAQMD and will reconcile any fee discrepancies due to schedule adjustments or increased equipment inventories.

L1-5 Contractor fleet inventories are currently provided to SMAQMD as part of an existing District-recommended mitigation measure adopted by a previous NLIP project phase to demonstrate a 40% reduction of particulate matter (PM) emissions, based on a comparison to the ARB fleetwide average. To date, fleet inventories provided to SMAQMD demonstrate achievement of 60–65% PM reduction when compared to the ARB fleetwide average. Due to the visibility concerns of retrofit equipment, SMAQMD's recommendation for 15% of contracted fleets to install diesel particulate filters (DPFs) is not required, but will be implemented as feasible.

The last bullet of Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} During Construction," of the DEIS/DEIR is revised as follows:

- When feasible and determined to be necessary, ~~i~~install ARB-certified Level 3 diesel particulate filters (DPF) on ~~a minimum of 15% of the total number of off-road (non-street legal)~~ diesel-powered construction equipment pieces ~~with an engine size equal to or greater than 50 hp throughout the duration of the project. For fleets with six or fewer total applicable equipment pieces, a DPF shall be installed on a minimum of one engine~~. All DPFs shall be kept in working order and maintained in operable condition according to manufacturer's specifications. At the time of writing, a list of ARB-certified Level 3 DPF can be found at http://www.arb.ca.gov/diesel/verdev/level3/level3.htm.

L1-6 The last paragraph of Impact 4.11-d, "Exposure of Sensitive Receptors to Toxic Air Emissions," in the DEIS/DEIR is revised as follows:

As discussed under Impact 4.11-c, above, the RD 1000 pumping plants and City of Sacramento sump pumps to be modified as part of the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative would be minor stationary sources of TAC emissions in Sacramento Counties. Diesel-powered backup generators would be used in emergency situations and would be tested monthly. Consequently, diesel PM emissions associated with the modified pump stations would be infrequent. Furthermore, this category of stationary source (i.e., portable equipment), in addition to any other stationary sources that may emit TACs (i.e., dry cleaners), would be subject to FRAQMD and SMAQMD permitting and toxic best available control technology (T-BACT) requirements. If the implementation of T-BACT would not reduce emissions to an acceptable level, then FRAQMD and SMAQMD would deny the required permit for the stationary source (in this case, the diesel-powered backup generators). Therefore,

operation of these stationary sources would not expose sensitive receptors to substantial concentrations of TACs. No other stationary sources of emissions would be associated with any of the action alternatives. Thus, this impact is considered to be **less than significant**. ***(Similar)***

L1-7 Comment noted.

L1-8 The measures included in Mitigation Measure 4.11-a, "Implement Applicable District-Recommended Control measures to Minimize Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} During Construction," of the DEIS/DEIR would also serve to reduce greenhouse gas emissions. The specific measures listed on page 5-22 of the DEIS/DEIR are not required to be implemented; rather, they are best management practices. The project proponent(s) would implement measures such as these during construction of the Phase 4b Project to reduce greenhouse gas emissions.

L1-9 Comment noted; all projects are subject to SMAQMD rules at the time of construction. The impact discussion and mitigation measures in the DEIS/DEIR require that USACE and SAFCA comply with SMAQMD rules in place at the time of construction.

L2

SUTTER COUNTY
COMMUNITY SERVICES DEPARTMENT

Planning – Lisa Wilson, Planning Manager
Animal Control
Building Inspection
Environmental Health

Director – Larry Bagley
Assistant Director – Randy Cagle
Fire Services – Dan Yager
Emergency Services – John DeBeaux

CERTIFIED AND FIRST CLASS MAIL

August 13, 2010

John Bassett, P.E., Director of Engineering
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Re: Response to the Draft EIS/EIR on the Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project

Dear Mr. Bassett,

Thank you for the opportunity to comment on the Draft EIS/EIR on the Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project. The County of Sutter has the following comments on the proposed EIS/EIR. L2-1

- Plate 2-6 indicates the Triangle Properties borrow area were previously analyzed, while other portions of the document indicate the area is a new source of borrow. Please address this conflict.

- The proposed Triangle Properties borrow area will include an area currently occupied by the Pleasant Grove Cemetery District cemetery. Page 2-57 and Section 4.8 of the environmental document do not contain any discussion of the cemetery or the potential impacts of soil borrow on the cemetery. The County requests the proposed project's impacts on this cemetery be discussed and analyzed in the environmental document and effective mitigation be incorporated. L2-2

- Plate 2-6, Plate 2-13, and various tables in the environmental document indicate the Brookfield borrow site will be reclaimed to managed marsh. In previous discussions with SAFCA, the County understood the site would be reclaimed to agriculture, as rice production. Please be aware that Sutter County Zoning Code Section 1500-1412 requires approval of a development agreement by the Board of Supervisors for the conversion of agricultural land to permanent habitat. L2-3

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Typically, the removal of more than 1,000 cubic yards of material from a site is subject to the requirements of the Surface Mining and Reclamation Act (SMARA). This requires a surface mining permit and reclamation plan to be processed by Sutter County. If SAFCA would like to use this document as a basis for CEQA review for a subsequent surface mining and reclamation plan application, then the EIR needs to specifically address the potential impacts of borrow activities as well. We look forward to working with you to assure that all surface mining and reclamation impacts are properly analyzed and mitigated. Please provide our office with all future notices regarding this project. L2-4

Sincerely,

Douglas G. Libby, AICP
Principal Planner

DL:kf

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Letter	Sutter County Community Services Department
L2	Douglas G. Libby, AICP, Principal Planner
Response	August 13, 2010

L2-1 To be consistent with the project description, Plate 2-6 is revised in the FEIS/FEIR to show that the Triangle Properties Borrow Area is a new source of borrow for the Phase 4b Project, rather than a previously analyzed source.

L2-2 Under the subheading "Triangle Properties Borrow Area" in Section 2.3.3.4, "Borrow Sites," of the DEIS/DEIR, it is noted that "no demolition of residences or *other non-agricultural uses* (emphasis added) would occur as part of borrow excavation." This paragraph is revised in the FEIS/FEIR to note the existence of the Pleasant Grove Cemetery District cemetery, and to further clarify that no borrow site excavation would take place in or near it. The text is revised as follows:

> The Triangle Properties Borrow Area (**Plate 2-13**) is located to the northeast of the Natomas Basin on the east side of the PGCC. It is bordered on the east by the Union Pacific Railroad. Farmland would be excavated to a depth of up to 6 feet and either reclaimed for rice cultivation or converted to detention basins to store PGCC overflow in the event that the PGCC culverts are removed. No demolition of residences or other non-agricultural uses would occur as part of borrow excavation. Excavation sites within the Triangle Properties Borrow Area would be set back at least 100 feet from existing roads, utilities, ~~or~~ irrigation ditches, as well as residential and other non-agricultural land uses, such as the Pleasant Grove Creek Cemetery District cemetery. The bridges for Howsley, Fifield, Keys, and Sankey Roads would be used as haul routes to bring the borrow material over the PGCC into the Natomas Basin for the construction of the PGCC and north NEMDC. Alternatively, temporary crossings of the PGCC could be constructed with culverts or bridges over the low-flow channel, to provide for off-road hauling.

The following new paragraph is added after the last bullet in Section 3.8, "Cultural Resources," of the DEIS/DEIR to describe the Pleasant Grove Cemetery District cemetery:

> - **CA-Sut-80H (P-51-000080H)**. Located just north of the Sacramento-Sutter County line and just east of the NEMDC this resource consists of a trash scatter that was determined ineligible for listing on the NRHP (EBASCO 1992a, 1992b).
>
> In addition to the resources in the Sutter County portion of the Natomas Basin, the Pleasant Grove Cemetery District cemetery occurs on the northern edge of the proposed Triangle Properties Borrow Area. Although the cemetery is not recorded as a cultural resource, it contains human remains subject to management required under CEQA. The cemetery occurs on the south side of Howsley Road east of the intersection with Pacific Avenue. This resource would be excluded from the footprint of borrow activities.

The last paragraph of Impact 4.8-d, "Potential Discovery of Human Remains During Construction," in Section 4.8, "Cultural Resources," of the DEIS/DEIR is revised as follows:

> Prehistoric human remains have been found at several prehistoric sites in the vicinity of the Phase 4b Project area. Previously unknown buried human remains may be unearthed, damaged, or destroyed during excavation activities associated with project construction and excavation of borrow from the sites identified in Chapter 2, "Alternatives." This work includes construction of levee improvements, seepage remediation, and changes

and improvements to drainage and irrigation infrastructure. Both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative have a high risk of disturbing previously undiseovered human remains because of the extent of ground-disturbing work required for the project. It should be noted that the Pleasant Grove Cemetery District cemetery oceurs on the northern edge of the proposed Triangle Properties Borrow Area. Although the cemetery is not recorded as a cultural resource, it contains human remains subject to management required under CEQA. The eemetery occurs on the south side of Howsley Road east of the intersection with Pacific Avenue. This resouree would be excluded from the footprint of borrow activities. Therefore, the Proposed Action would not affect human interments in the cemetery. However, beeause of the sensitivity for buried human remains in the areas where ground-disturbing work would occur-, this impact is considered **potentially significant**. ***(Similar)***

L2-3 Comment noted. Development agreement approvals will be obtained as necessary.

L2-4 The California Surface Mining and Reclamation Act (SMARA) permitting is described in Section 3.4.1.1, under "California Surface Mining and Reclamation Act," of the DEIS/DEIR and is also addressed by Mitigation Measure 4.4-a(2), "Secure and Implement the Conditions of the California Surface Mining and Reclamation Act Permit or Exemption," in the DEIS/DEIR. The environmental impacts of borrow site excavation, including at sites that would be located within the Triangle Properties Borrow Area, have been addressed throughout the DEIS/DEIR. Table 2-23 in the DEIS/DEIR describes the size and depth of the area that would be excavated and the proposed postreclamation use. Agricultural impacts are addressed in Section 4.2, "Agriculture," of the DEIS/DEIR. Hydrology, Water Quality, Biological Resources, Cultural Resources, Transportation and Traffic, Air Quality, and Hazards and Hazardous Materials impacts of borrow site excavation are addressed in Sections 4.5, 4.6, 4.7, 4.8, 4.10, 4.11, and 4.16, respectively, of the DEIS/DEIR.

L3

DEPARTMENT OF TRANSPORTATION

CITY OF SACRAMENTO
CALIFORNIA

915 I STREET, ROOM 2000
SACRAMENTO, CA
95814-2604

PH. (916) 808-8300
FAX (916) 808-8281

August 16, 2010

Elizabeth Holland,
USACE Sacramento District, Planning Division,
1325 J Street,
Sacramento, CA, 95814

Dear Ms. Holland:

Attached to this letter you will find comments on behalf of the City of Sacramento Department of Transportation, Engineering Services Division for the Natomas Levee Improvement Program Draft Environmental Impact Statement/Draft Environmental Impact Report.

If you have any questions or require any additional information, please call me at (916) 808-8279.

Sincerely,

Ryan Moore
Supervising Engineer,
Funding and Project Delivery,
Department of Transportation

Department of TRANSPORTATION City of Sacramento

Part 1 - Project Description

Page 2-24 says "To comply with USACE vegetation guidance, all vegetation would be cleared at least 15 feet from the landside toes of the improved levees." The removal of heritage trees within the city must be done in accordance with the City of Sacramento heritage tree ordinance, including the proper mitigation of lost resources. Mitigation shall be coordinated with Urban Forest Division of the Department of Transportation. L3-1

Page 2-25 says "Construct a bicycle and pedestrian trail along the 42-mile loop of the Natomas Basin levee perimeter in the northwestern portion of the County of Sacramento, southern portion of Sutter County, and a portion of the City of Sacramento (program-level analysis only, because site specific details are not available)..." The environmental document should clarify that the actual construction of the finished paved bike and pedestrian trail is not necessarily funded. In this context, the City of Sacramento would like to request that a portion of the proposed trail be constructed through a contribution of funds from the City. This trail segment is on Reach 20, Sta. 940+00 to Sta. 955+00. The City of Sacramento would like to provide the additional funds for paving the proposed bike trail at the top of the levee along this segment. This would include the cost of paving the east leg of the ramps at Sta. 940+00. By including the paving of this segment of bike trail, a vital link in the City's off street bike trail system can be established connecting Natomas to the American River Parkway.

L3-2

Page 2-31 thru 2-32 says "Where cutoff wall construction occurs through the crown of the adjacent levee, some reconstruction work on Garden Highway would be required to restore the landside lane of the roadway. Garden Highway intersections at major roadway ramps would require degrading, rebuilding the embankment, and repaving to accommodate the installation of the cutoff wall and slope flattening. Traffic control and detours would be required during this phase of construction..." Will the repaving of the Garden Highway involve bringing the street up to city standards, including elements that would make the street more complete as outlined in the City's General Plan? At the very least, when this L3-3

segment of road is re-paved, the City of Sacramento would like to review and approve the striping plans to see if an additional eastbound bike lane can be striped within the existing roadway width. L3-3 (Con't.)

Page 2-31 says "Garden Highway intersections at Natomas Park Drive, Truxel Road, Arden-Garden Connector, Northgate Boulevard, and four additional private parcel ramps would require degrading, rebuilding the embankment, and repaving to accommodate the installation of the cutoff wall and slope flattening. The ramps would be reconstructed to the current general ramp and intersection geometry..." At Reach 4, Sta. 100+00, the Garden Highway runs past the Niños Parkway. Will there be an access ramp to the open space as part of this project? If so, can the ramp be made so that it one day can become a bike trail access point to the Niños Parkway? L3-4

Page 2-53 and a similar paragraph on page 2-55 says "To facilitate raising of the pump discharge pipes, the existing bike trail would require a local raise in grade over the pipes. The trail raise would transition back down to existing grade upstream and downstream of the local raise. This work would require partial regrading of the waterside slope for the length of the raised bike trail. At this site, the levee would be degraded and reconstructed with engineered fill. A detour or closure of the bike trail would be required for up to 30 days..." Will the bike trail be reconstructed to meet current city standards? L3-5

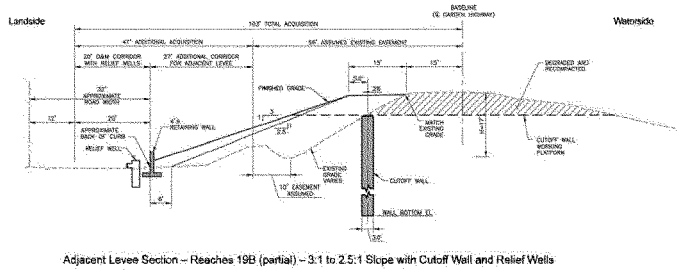
Page 2-53 says "The bike trail would be funded locally, separate from this project." Will there be an opportunity for the City of Sacramento to contribute funds to the project to construct a portion of the trail? L3-6

Page 2-53 says "Where a Class I bike trail cannot be constructed because of physical constraints, the bikeway would be designed to exceed or meet the minimum standards for a Class II facility (a lane set aside in city/county streets exclusively for bikes)." Will the process of delivering this project include an opportunity to work with City and County representatives to plan the locations of these locations? L3-7

Page 2-67 says "Because of the requirement to have newly constructed levees settle prior to final inspection and certification, trail construction in these areas would not occur until the following year's construction season, at the earliest. In addition, the long lead time in securing funding sources could delay construction for several years after completion of levee construction." Would this apply to the segment of bike trail on Reach 20, Sta. 940+00 to Sta. 955+00 where the levee is going to be regarded and repaved for the Garden Highway? L3-8

Part 2 - Plates

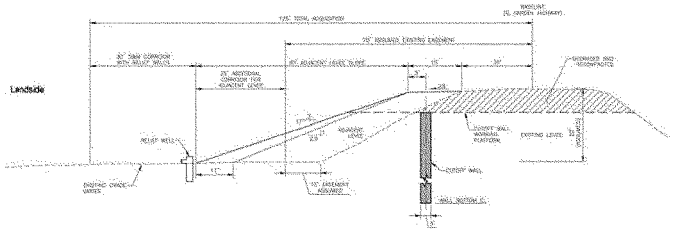
Page 2-101: The cross section on this page does not indicate the existing bike and pedestrian trail that is at the toe of the levee which will be covered over as a result of the project. L3-9



Adjacent Levee Section – Reaches 19B (partial) – 3:1 to 2.5:1 Slope with Cutoff Wall and Relief Wells

Page 2-103: The cross section on this page does not indicate the existing bike and pedestrian trail that is at the toe of the levee which will be covered over as a result of the project. In addition, this section shows a half width of Garden Highway at 20 feet. The crown of the Garden Highway actually varies in size, making the half width as much as 26 feet. Are we to make the assumption that the placement of the adjacent levee will be 15 feet to the north of the existing hinge point of the levee, or will it be set at 20 feet from the centerline of the Garden Highway?

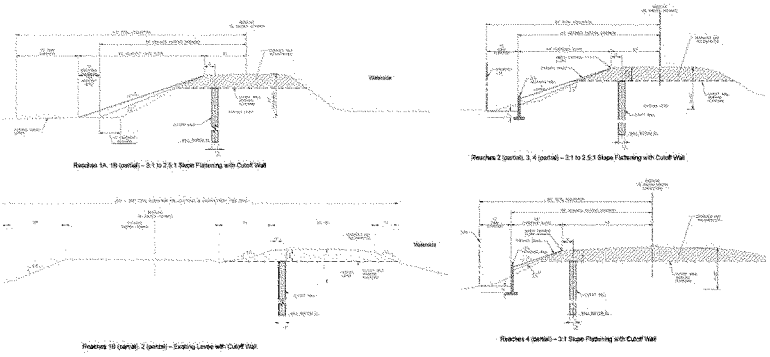
L3-10



Adjacent Levee Section – Reaches 19B (partial), 20 – 3:1 to 2.5:1 Slope with Cutoff Wall and Relief Wells

Pages 2-107 and 2-109: The cross sections on these pages do not indicate the existing bike and pedestrian trail that will be removed and presumable replaced as a result of the project. In the areas between Natomas Park Drive and Northgate Boulevard, will the future bike trail be on the north or south side of the Garden Highway?

L3-11



Reaches 1A, 1B (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall

Reaches 2 (partial), 3, 4 (partial) – 3:1 to 2.5:1 Slope Flattening with Cutoff Wall

Reaches 1B (partial), 2 (partial) – Existing Levee with Cutoff Wall

Reaches 4 (partial) – 3:1 Slope Flattening with Cutoff Wall

Part 4 – Impacts Assessments

In Section 4.10.1.2, The environmental document states that the threshold of significance for transportation related impacts would result in a significant impact related to transportation and circulation if the proposed project, or project alternatives would do any of the following:

- "...substantially increase hazards due to a design feature or incompatible uses;
- result in inadequate emergency access; or
- conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities."

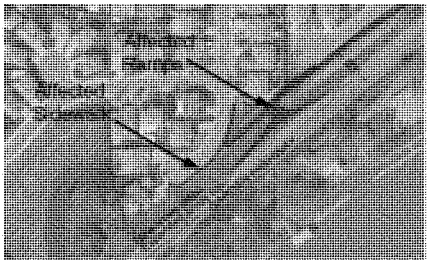
Within this context, this environmental document does not adequately address significant impacts that would result from the construction of the proposed adjacent levee structures. These impacts generally are the loss of existing emergency vehicle access points and the loss of existing pedestrian and bicycle facilities.

Within the City of Sacramento along the Garden Highway between Interstate 80 and Interstate 5, there are at least 2 public streets, 8 property access ramps and 6 emergency access points that connect with the Garden Highway and/or to each other. The proposed project does not show sufficient detail of how these connections will be modified. Based on the information provided, the proposed project will completely eliminate some of the emergency access points. Mitigations for these losses should be provided.

Furthermore, the stretch along the Garden Highway between Interstate 80 and Natomas Park Drive has at least 4 existing bike and pedestrian facilities that will be affected. The proposed project does not indicate what will happen to these facilities. Using the information provided about the proposed project, the loss of existing bike and pedestrian facilities is anticipated. Mitigations for these losses should be provided. L3-12

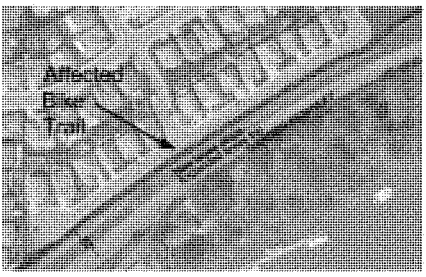
Details of these impacted areas are as follows:

1. Reach 19B, Sta. 879+00 to Sta. 885+00; there are two emergency access ramps at this location which provide access to the cul-de-sacs streets called Avocet Court and Marina Glen Way. The construction of the proposed project will require some re-alignment of these ramps to allow continued emergency vehicle access. These access ramps also function as bike and pedestrian access ramps. Construction of the re-aligned ramps should comply with accessibility standards. The ramp to Marina Glen Way may require a retaining wall structure as mitigation. The construction of the proposed project will also interfere with the existing pedestrian walkway along the end of Marina Glen Way. The existing sidewalk should not be impacted, and proper mitigation, such as the inclusion of a retaining wall should be included.



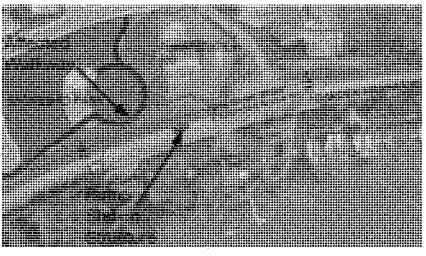
5

2. Reach 19B, Sta. 883+00 to 892+00; there is a bike and pedestrian facility along Swainson Way/Avocet Court between the street curb and the toe of the levee. The construction of the proposed project will place the levee on top of this facility, rendering it unusable and disconnected from Shorebird Park. Mitigation for the loss of this facility must be provided. One option for mitigation would be the construction of the proposed bike trail at the top of the levee. If this is done, part of this mitigation should include connectivity to Shorebird Park near Sta. 892+00.



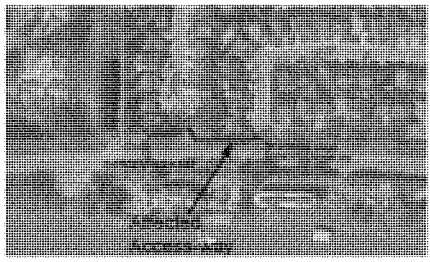
3. Reach 19B, Sta. 892+00 to Sta. 895+00; the existing pedestrian pathways within Shorebird Park run along the toe of the levee. The construction of the proposed project will place the levee on top of these pathways, rendering them unusable. Mitigation for the loss of these pathways must be provided. One option for mitigation would be the reconstruction of these pathways in a similar location and layout, but at a higher elevation. This could also be an opportunity to create connectivity to the proposed bike trail at the top of the levee.

L3-12 (Con't.)



4. Reach 19B, Sta. 895+00; there is an elevated concrete structure adjacent to the Garden Highway that is associated with City Pump Station 160. The size and location of this structure appears to be in conflict with the location of the proposed bike trail at the top of the levee. While it is understood that the proposed project does not normally include the construction of this proposed bike trail, should this trail be selected as mitigation for the impact identified previously, the design of this trail should look at ways to coordinate with the pump station structure. This could be an opportunity to connect to the pedestrian pathways in Shorebird Park.

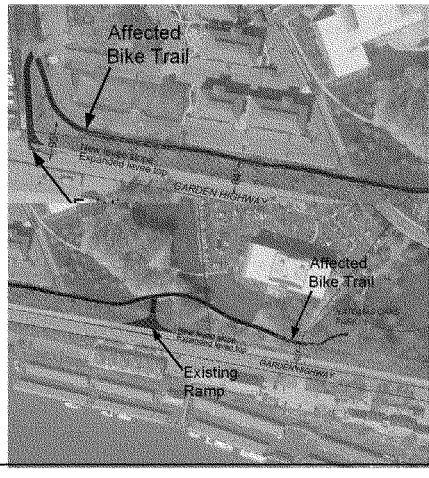
5. Reach 19B, Sta. 913+00 to 917+00; this area includes the intersection of Orchard Lane and Garden Highway and an emergency vehicle access/bike and pedestrian facility connecting Durazno Court to La Lima Way. The proposed project does not appear to significantly change the intersection at Orchard Lane; however there will likely be impacts during the construction. Appropriate detours and construction phasing for this intersection would be required. The proposed project will place the levee on top of the emergency vehicle access between Durazno Court and La Lima Way. The loss of this access-way must be mitigated. The proper mitigation for this impact would be the construction of an alternative access-way which will provide adequate emergency vehicle access and maintain bike and pedestrian connectivity between these streets. One option would be to construct ramps from the new proposed bike trail at the top of the levee to the two streets below.



L3-12
(Con't.)

6. Reach 20, Sta. 929+00; there is a traffic channelization island and an emergency access road at this location. The size and location of this structure appears to be in conflict with the location of the proposed bike trail at the top of the levee. While it is understood that the proposed project does not normally include the construction of this proposed bike trail, evaluation for the need for the continued use of this channelization island should be considered. Additionally, there is an existing emergency access road at this location. It does not appear that the propose project will require a modification of this access road, since it already ties into a wide part of the existing levee. The environmental document should verify that there is no impact at this location.

7. Reach 20, Sta. 929+00 to Sta. 940+00 and at Sta. 945; there is an existing bike and pedestrian trail near the toe of the levee. The construction of the proposed project will place the levee on top



of or near the edge of these pathways, rendering them unusable. Mitigation for the loss of is trail must be provided. One option for mitigation would be the reconstruction of this trail in a similar location and layout, but at a higher elevation. This could also mitigated by using the alternative 2.5:1 slope for the levee. Another alternative could be the installation of a retaining wall.

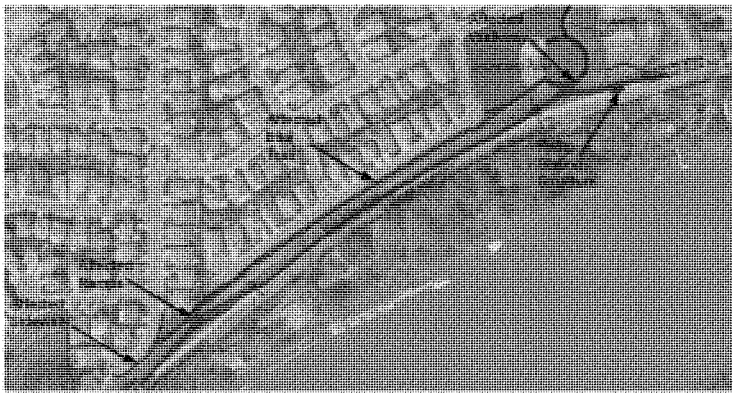
8. Reach 20, Sta. 949+00; there is a property access ramps to the Garden Highway at this location. This ramp is currently used as an unpaved footpath. The construction of the proposed project will require a re-alignment of this ramp to allow continued access to the City Park property and the existing nature trail further north. The proper construction to appropriate standards for these ramps should be part of the mitigation plan.

9. Reach 1A/1B and Reach 2, Sta. 0+00 to Sta. 37+00; there is an existing bike trail along the top of the levee for this segment. The construction of this project should replace the bike trail according to current standards.

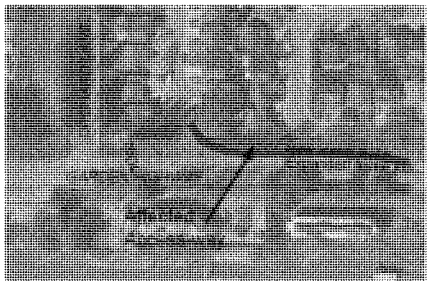
L3-12 (Con't.)

Suggested Mitigations

1. Reach 19B, Sta. 879+00 to Sta. 885+00; To address several impacts, the City is suggesting that the proposed bike trail at the levee top be implemented for this segment. At the west end, the ramps to the cul-de-sac streets would be reconstructed, the trail would have a new ramp into Shorebird Park. The walkways within the park could be elevated to tie-in with the trail. To avoid the pump station structure, the trail would run along the north of it.



2. Reach 19B, Sta. 913+00 to 917+00; Since the construction will cut off the access to Durazno Court, one form of restoring emergency access would be to provide a new ramp up to the Garden Highway.



L3-12 (Con't.)

Letter L3 Response	City of Sacramento, Department of Transportation Ryan Moore, Supervising Engineer, Funding and Project Delivery August 16, 2010

L3-1 Comment noted. As detailed project design develops, the project proponent(s) will coordinate with the City of Sacramento as appropriate.

L3-2 The description of the Natomas Levee Class 1 Bike Trail Project on page 2-25 of the DEIS/DEIR is only a brief summary in a list of project components. The full description is located in Section 2.3.4.7, "Natomas Levee Class 1 Bike Trail Project," of the DEIS/DEIR where it is noted that the bike trail would be funded locally, separate from the Phase 4b Project. The description also notes that the DEIS/DEIR provides only program-level environmental analysis of the bike trail component. Detailed design, including a specific route, has not been developed. Site-specific environmental review will be conducted once detailed design is available.

L3-3 The extent to which levee construction would affect Garden Highway, such that it would require reconstruction, would be determined during final design. The decision of how to reconstruct Garden Highway will be determined in conjunction with local jurisdictions and non-Federal sponsors.

L3-4 The DEIS/DEIR addresses the potential environmental impacts of a worst-case levee improvement footprint based on preliminary design. Detailed engineering specifications would be developed during final design and coordinated with the City of Sacramento.

L3-5 See response to comment L3-3. Mitigation Measure 4.13-c(1), "Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair of Damage to Recreational Facilities," in the DEIS/DEIR requires coordination with the City of Sacramento to restore access and repair or reconstruct any construction-related damage to bicycle facilities.

L3-6 Sacramento County is the project proponent for the Natomas Levee Class 1 Bike Trail Project and would be responsible for coordinating design and funding for this component.

L3-7 See response to comment L3-6.

L3-8 If the commenter refers to the existing bike trail, which is located at the landside toe of the levee, reconstruction of the bike trail would likely occur at the toe of the levee but would be determined during final design of this component of the Phase 4b Project. If the commenter is referring to the proposed Natomas Levee Class 1 Bike Trail Project, the exact route would be determined during detailed design of that project.

L3-9 The cross sections shown in Plates 2-8a through 2-8d of the DEIS/DEIR are not intended to show existing conditions, but rather to provide examples of typical levee design in these levee segments. Existing infrastructure affected by construction would be replaced in kind.

L3-10 See responses to comments L3-4 and L3-9.

L3-11 See responses to comments L3-4 and L3-9.

L3-12 The DEIS/DEIR addresses temporary and short-term disruption of emergency service response times and access in Impact 4.10-c, "Temporary and Short-Term Disruption of Emergency Service Rees Times and Access," of the DEIS/DEIR. Implementation of Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips," of the DEIS/DEIR bullet (f) would ensure coordination with the City of Sacramento regarding the timing of specific road closures that would affect access for emergency vehicles. See response to comment L3-3 regarding reconstruction of roadway intersections. Detailed engineering specifications for reconstructing roadways will be developed during final design.

Table 4.13-1 in the DEIS/DEIR identifies temporary impacts to bike trails from project construction. Mitigation Measure 4.13-c(1), "Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and or County Department of Parks and Recreation to Repair of Damage to Recreational Facilities," of the DEIS/DEIR requires a bicycle detour plan to reduce impacts to temporary closure of bicycle facilities and coordination with the City of Sacramento to restore access and repair or reconstruct any construction-related damage to bicycle facilities. Detailed engineering specifications for reconstructing bike facilities will be developed during final design.

L4

Serving Sutter and Yuba Counties

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www.fraqmd.org

David A. Valler, Jr.
Air Pollution Control Officer

August 16, 2010

Mr. John Bassett, Director of Engineering
Sacramento Area Flood Control Agency
1007 Seventh Street, 7th Floor
Sacramento, CA 95814

Ms. Elizabeth Holland, Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

Re: DEIS/DEIR American River Watershed Common Features Project/Natomas Post-Authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project.

Dear Mr. Bassett and Ms. Holland,

The Feather River Air Quality Management District (District) appreciates the opportunity to provide comments on the above referenced project. The District has reviewed the project and has the following comments:

- In Table 3.11-1 on page 3-100, under the Yuba City-Almond Street Monitoring Station section, only State Maximum 24-hour $PM_{2.5}$ concentrations have been reported. The State does not have a 24-hour $PM_{2.5}$ ambient air quality standard (AAQS). The State AAQS is an annual average not to exceed 12 $\mu g/m^3$. The District recommends adjusting the table to clarify the $PM_{2.5}$ State annual average AAQS (12$\mu g/m^3$) and the National 24-hour AAQS (35 $\mu g/m^3$) and annual average AAQS (15.0 $\mu g/m^3$), which is reported accurately in Table 3.11-2 on the following page. L4-1
- In Table 3.11-2 on page 3-101, south Sutter County and Sacramento County should have the same nonattainment status for the National 8-hour ozone AAQS as they both included in the Sacramento Federal Nonattainment Area. Table 3.11-2 states that the attainment status for Sutter County is Severe Nonattainment and Sacramento County is Serious Nonattainment. L4-2
- Also on Table 3.11-2 on page 3-101, the National 1-hour AAQS for nitrogen dioxide was adopted on January 22, 2010. The new standard is 0.100 ppm. L4-3

- As an alternative to the mitigation measure listed in the last bullet on page 4.11-16, the District has authorized an additional 20% PM reduction in project wide fleet-wide averages in lieu of 15% DPF's required on off-road construction equipment. L4-4

If you need further information or assistance, please contact me at (530) 634-7659 x210. Air District staff will be available to assist the project proponent or Lead Agency as needed.

Sincerely,

Sondra Andersson

Sondra Andersson
Air Quality Planner

Enclosures: None

File: Chron

Letter L4 Response	Feather River Air Quality Management District Sondra Andersson, Air Quality Planner August 16, 2010

L4-1 Table 3.11-1 in the DEIS/DEIR is revised to clarify that the California Ambient Air Quality Standards (AAQS) for fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$) is based on an annual average (not to exceed 12 $\mu g/m^3$); and the National $PM_{2.5}$ AAQS is based on a 24-hour and annual average. See revisions in **Appendix F** to this FEIS/FEIR.

L4-2 Table 3.11-2 in the DEIS/DEIR is revised to indicate that the National 8-hour ozone nonattainment designation for both south Sutter County and Sacramento County is "Severe-15" Non-attainment, effective June 4, 2010 for Sacramento Metropolitan areas per EPA-R09-OAR-2008-0467; FRL-9141-8. See revisions in **Appendix F** to this FEIS/FEIR. The Feather River Air Quality Management District (FRAQMD) suggested that the designation be updated to reflect a "serious" non-attainment designation; however, the current Federal non-attainment designation is "Severe-15."

L4-3 The National 1-hour nitrogen dioxide (NO_2) standard provided in Table 3.11-2 in the DEIS/DEIR is updated to 0.100 parts per million (ppm), as adopted on January 22, 2010. See revisions in **Appendix F** to this FEIS/FEIR.

L4-4 See response to comment L1-5.

L5

DEPARTMENT OF
PARKS AND RECREATION

PARKS ADMINISTRATION
Park Planning and Development Services

CITY OF SACRAMENTO
CALIFORNIA

915 I STREET, 5TH FLOOR
SACRAMENTO, CA 95814

PH 916-808-5200
FX 916-808-8265

August 16, 2010

Ms. Elizabeth Holland
Planning Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

Subject: *Draft Environmental Impact Statement/ Draft Environmental Impact Report on the American River Watershed Common Features Project/ Natomas Post-authorization Change Report/ Natomas Levee Improvement Program, Phase 4b Landside Improvements Project*

Dear Ms. Holland:

Thank you for the opportunity to review the *Draft Environmental Impact Statement (DEIS) and Environmental Impact Report (DEIR)* for these important flood control projects. We are pleased that these levee improvements are in the process of being implemented; this is a very important project for the entire region.

The City of Sacramento Department of Parks and Recreation is responsible for the management of all parks and off-street bikeways within the City of Sacramento. A letter has been submitted separately from the City of Sacramento Department of Transportation concerning impacts to the City's existing and planned off-street bikeways. We did not want to duplicate those comments, but support them as they relate to the City's off-street bikeway system. Our comments provided below focus on impacts to City parks. L5-1

The City of Sacramento owns and manages thirteen neighborhood and community parks or regional parkways within or near the Phase 4B Project Area. All will be impacted in the short term and/or long term under the various alternatives identified in the report. From our preliminary calculations, it appears that the overall impact to the park system serving the South Natomas Community Plan Area would total about six (6) acres, with the greatest impact occurring at the Costa Park Site.

The following comments are offered:

Page 4.7-8, Adjacent Levee Alternative (Proposed Action), Long-Term and Permanent Impacts Due to Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats, 1st Paragraph: The last sentence mentions the planting of native trees to create woodland habitat along the Lower Dry Creek immediately east of NEMDC. Any plantings of mitigation trees at this location, also known as Hansen Ranch, will need to consider affects to the long term development plans for this site since mitigation trees would need to be protected thereafter. L5-2

Page 4.13-3, No Action Alternative, No Phase 4b Project Construction, 1st Paragraph:
In order to gain an understanding of the magnitude of the impact on heritage trees in the affected City parks, a survey of the affected areas should be conducted.

The United States Army Corps of Engineers (USACE) will need to follow Sacramento City Code Chapter 12.64 Heritage Trees, including pulling necessary permits for the removal of Heritage Trees. Language should state that USACE will identify each tree that qualifies for Heritage Tree status through a survey. In regards to the Heritage Trees that are being targeted for removal, mitigation will be based on diameter inches at a 1 to 1 replacement ratio. Therefore, if a 24 inch diameter Heritage Tree is removed than 24 diameter inches of new trees will be the replacement. In addition the Army Corps of Engineers will be required to maintain the new trees during the first 3 year establishment period, and longer if planted under difficult cultural conditions. You may need to contract with a third party maintenance provider for the work, like the Tree Foundation (http://www.sactree.com/). L5-3

Page 4.13-3, Adjacent Levee Alternative (Proposed Action), 2nd Paragraph:
See comments above regarding Sacramento City Code Chapter 12.64 on Heritage Tree removal.

Page 4.13-11, Fixed-in-Place Alternative, Mitigation Measure 4.13-b: Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities:
The City will work with SAFCA and USACE staff to find suitable alternatives to compensate for parkland loss, preferably in the form of additional parkland within the South Natomas Community Planning Area. Where manmade amenities are impacted, including irrigation systems, play structures, walkways, landscaping, or other associated features, we will expect that funds will be made available for the redesign and reconstruction of the impacted parks under the direction of the City of Sacramento Department of Parks and Recreation. In addition, at the appropriate time, USACE and Sacramento Area Flood Control Agency (SAFCA) will need to obtain all necessary property rights (rights of entry or temporary or permanent easements) prior to conducting any work on any of the parks. L5-4

Page 4.13-4, Table 4.13-1, Bannon Creek Nature Preserve, Permanent Impacts:
Both the Adjacent Levee Alternative and the Fix-in-place Alternative will encroach 50 feet into the Bannon Creek Nature Preserve causing the loss of Heritage Oak Trees. See comments above regarding Sacramento City Code Chapter 12.64 on Heritage Tree removal. (See attached aerial photo) L5-5

Page 4.13-4, Table 4.13-1, Costa Park Site (Park Site SN2), Permanent Impacts:
Both the Adjacent Levee Alternative and the Fix-in-place Alternative propose the construction of an adjacent levee, seepage berm and utility corridor that would encroach 280'-290' into the park site making any future park use unfeasible, which is a more than significant impact. Can park amenities be built on top of the seepage berm or can the USACE mitigate the impact by providing equivalent park acreage within ½ mile of the park site? In addition, there is no mention of the existing building on the site and how the elimination of that building will be mitigated. In order to investigate if park features can be built on top of the seepage berm we need to know: 1) what is the slope of the seepage berm?; and, 2) can a park be placed on top of the seepage berm as an approach to co-locate the park on the property and fully utilize the entire park acreage? Are there other alternatives to the seepage berm that would not render this park site undevelopable? (See attached aerial photo) L5-6

Page 4.13-6, Table 4.13-1, Garden Land Park, Permanent Impacts:
Both the Adjacent Levee Alternative and the Fix-in-place Alternative propose expansion and/or relocation of the City of Sacramento Sump Pump 102 at this park site. This will have substantial impact on the usability of this park and more information is needed as to where and when the USACE is proposing to relocate the Sump Pump and to what extent it will be expanded. This information is essential to understand the full impact to the park site. Timing is especially important because we are scheduled to construct park improvements in June 2011 and we would not want to construct improvements that would conflict with the Sump Pump expansion/relocation. Can this sump pump be moved off of the park site altogether? If the sump pump will be moved within the park site, can it be moved to the northeast or southeast corner of the site for better utilization of the park? (See attached master plan) L5-7

Page 4.13-7, Table 4.13-1, Natomas Oaks Park, Permanent Impacts:
Both the Adjacent Levee Alternative and the Fix-in-place Alternative propose 50 to 70 foot encroachments L5-8

into the park, which will cause the loss of approximately 5-7 Heritage Oak Trees. See comments above regarding Sacramento City Code Chapter 12.64 on Heritage Tree removal. In addition there is an unpaved access ramp that slopes down into the natural preserve which will need to be rebuilt and maintained for access. Also, the improvements at this Park Site where funded by the Federal Land and Water Conservation Grant Program subject to Section 6(f)3 protections and shall not be converted to other than public outdoor recreation use without the approval of the U.S. Secretary of the Interior. (See attached master plan) L5-8 (Con't.)

Page 4.13-7, Table 4.13-1, Ninos Parkway, Permanent Impacts:
Both the Adjacent Levee Alternative and the Fix-in-place Alternative proposal would encroach into the southern edge of the Ninos Parkway. If community garden plots are permanently affected, how will encroachment be mitigated? Will the USACE mitigate the impact by providing equivalent park acreage somewhere else within the SN Community Plan Area? Since the City's Bikeway's Master Plan calls for a bike trail connection between Ninos Parkway and Garden Highway using an off-street bike ramp, can one be built as part of the mitigation measure for encroaching into the Ninos Parkway? (See attached master plan) L5-9

Page 4.13-8, Table 4.13-1, Sand Cove Park, Permanent Impacts (Fix-in-Place Alternative):
In 2007, USACE, Sacramento District, City of Sacramento, Reclamation District 1000 and SAFCA completed bank protection measures to prevent ongoing streambank erosion and resource vandalism at this location. Any work at this site will need to avoid any impacts to this recently completed project. (See attached master plan) L5-10

Page 4.13-8, Table 4.13-1, Shorebird Park, Permanent Impacts:
The Adjacent Levee Alternative will encroach 50 feet into the park, causing impacts to irrigation lines, concrete walkways, landscaping, berms and lawns. Redesign of the park will be necessary to redevelop the public amenities and reconfigure the irrigation system, which need to be funded. This work shall be considered a part of the compensation for impacts to the park. Also, will a "utility corridor" consume additional park acreage? Are you proposing a "utility corridor" abutting the new landside toe the levee? What is allowed in a "utility corridor"? Can landscaping be planted abutting the new landside toe of the levee or are there restrictions? (See attached master plan) L5-11

Page 4.13-10, Table 4.13-1, Ueda Parkway, Permanent Impacts:
See comments above regarding Sacramento City Code Chapter 12.64 on Heritage Tree removal. L5-12

I am also attaching the Park Master Plan and aerial photographs for each of park sites impacted in order to give a better understanding of the site and the potential disturbance to park features.

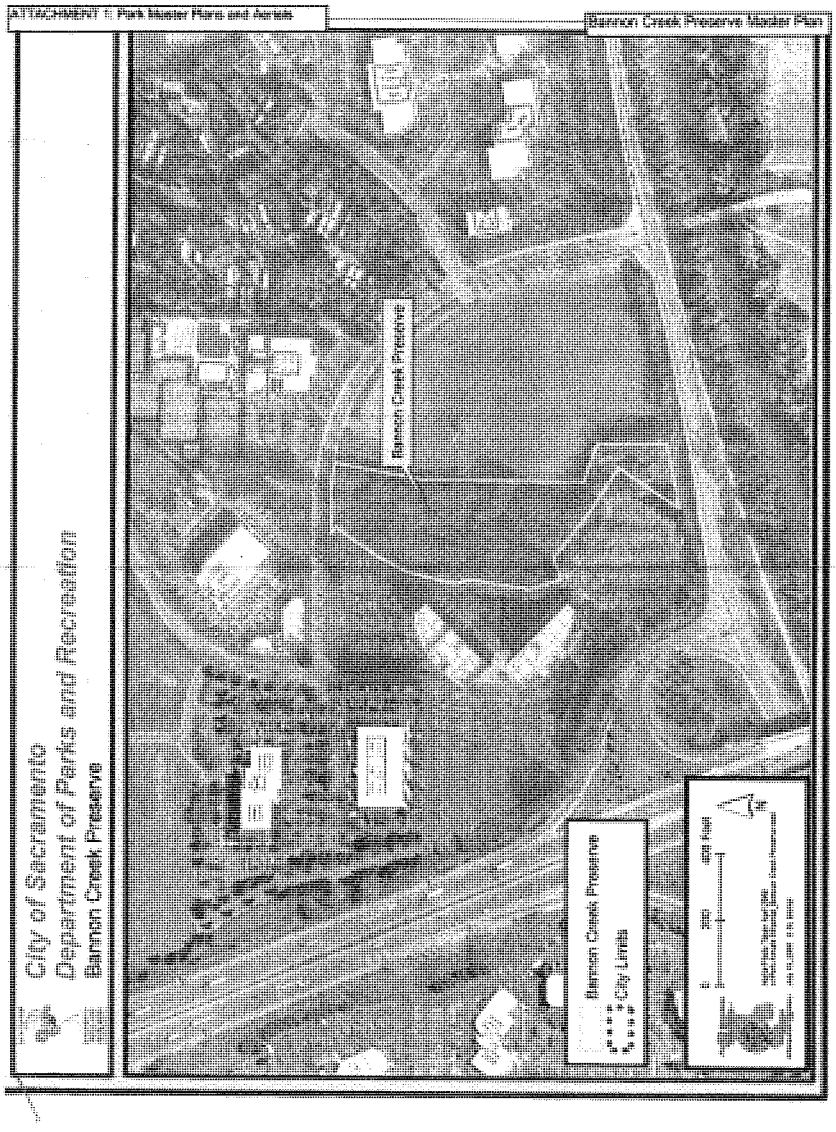
Again thank you for the opportunity to review this document. My staff and I look forward to working with you on this project and want to speak further about project specifics. Areas of further discussion include identifying developable parkland to compensate the loss of parkland in the South Natomas Community Plan Area, location of heritage trees mitigation, mitigation of impacted park amenities, processing of property rights, and rebuilding of access ramps. I am available to meet to further discuss these concerns and questions. You can contact me at 916-808-1955 or Raymond Costantino at 916-808-8826 to arrange a meeting. L5-13

Sincerely,

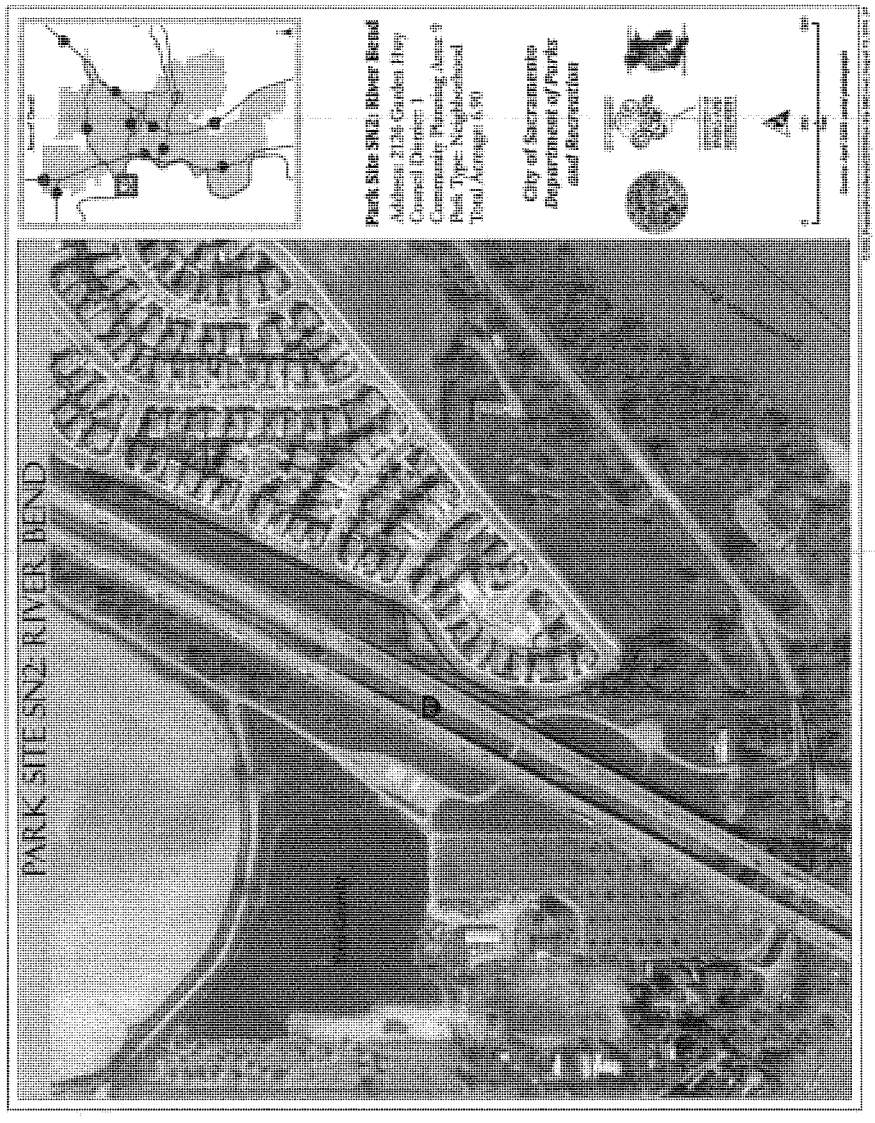
J.P. Tindell
Park Planning & Development Manager

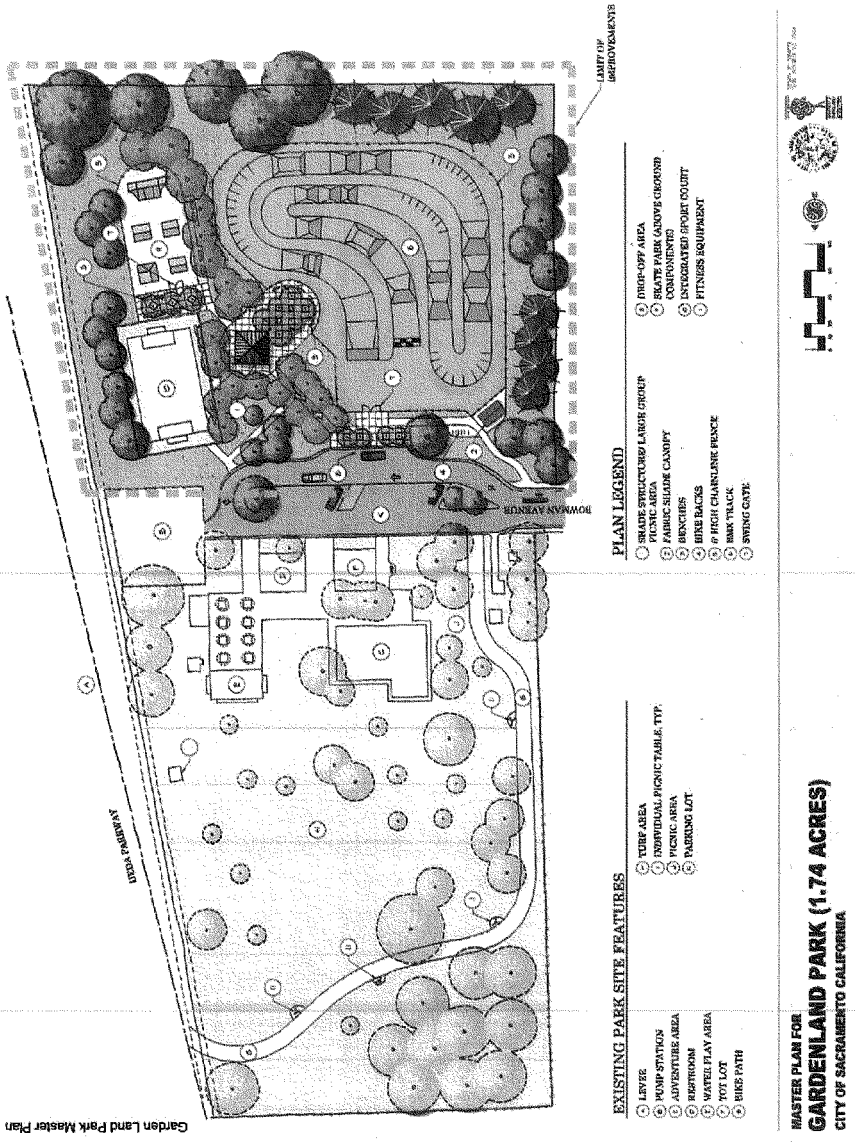
Attachment 1: Park Master Plans and Aerials

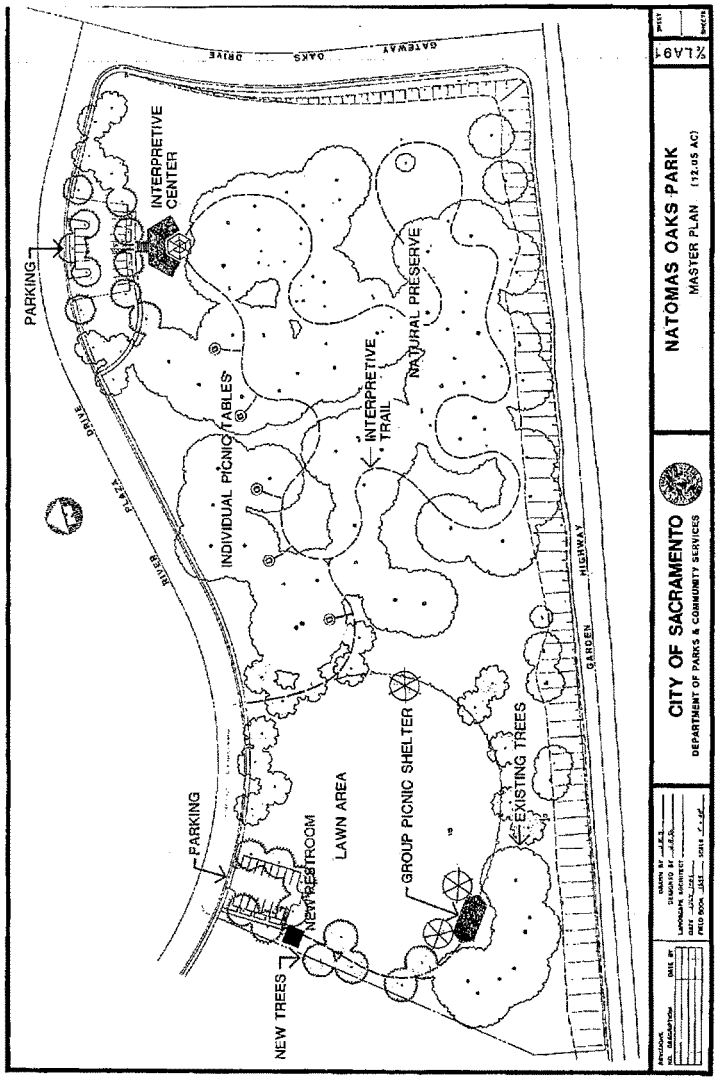
cc: John Bassett, Sacramento Area Flood Control Agency
Mary de Beauvieres, City of Sacramento, Parks and Recreation Department
Ed Cox, City of Sacramento, Department of Transportation
Dan Roth, City of Sacramento, Council District 1 District Director


ATTACHMENT 1: Park Master Plans and Aerials
Bannon Creek Preserve Master Plan
City of Sacramento
Department of Parks and Recreation
Bannon Creek Preserve
Bannon Creek Preserve
Bannon Creek Preserve
City Limits

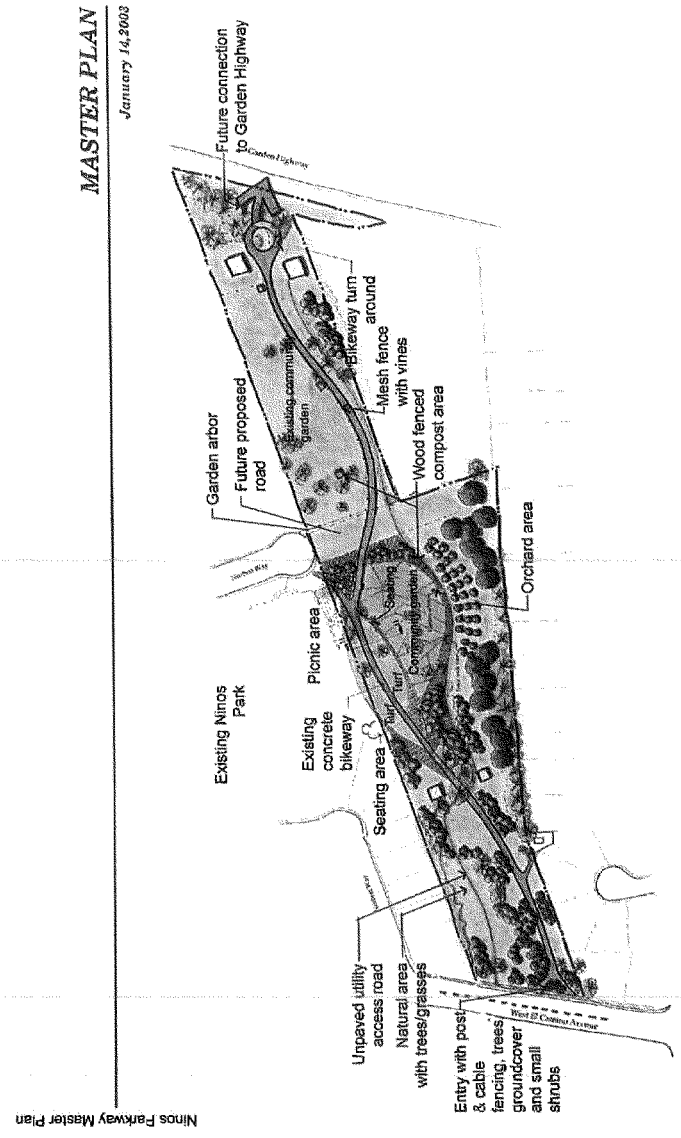
Costa Property, 2126 Garden Highway

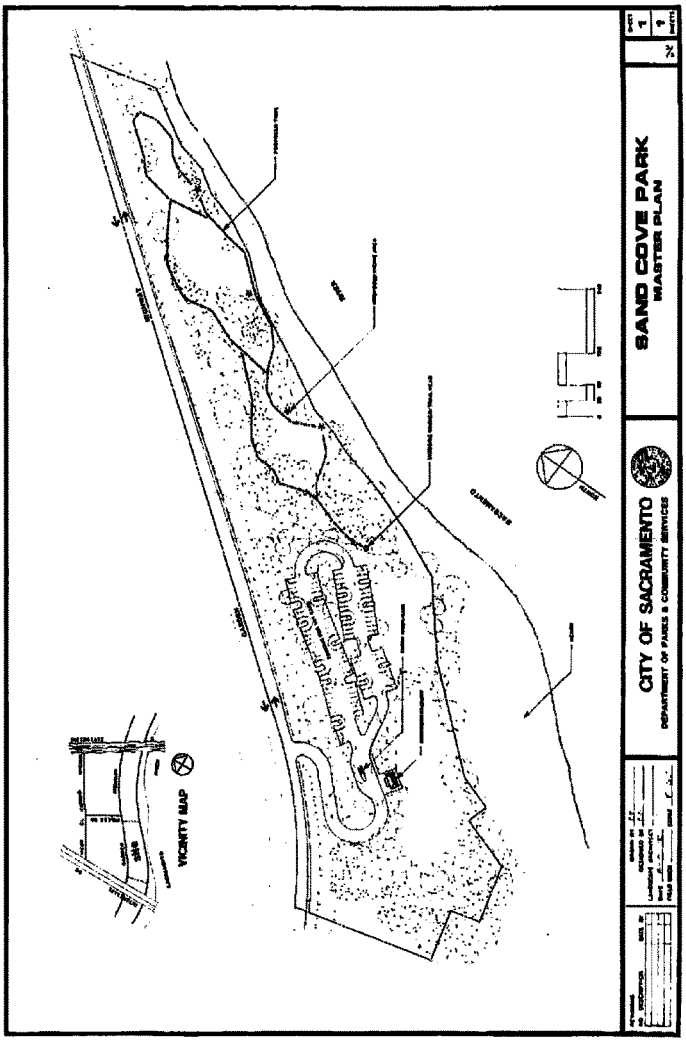



LIMIT OF IMPROVEMENTS
BOWMAN AVENUE
UEDA PARKWAY
Garden Land Park Master Plan
EXISTING PARK SITE FEATURES
LEVEE
PUMP STATION
ADVENTURE AREA
RESTROOM
WATER PLAY AREA
TOT LOT
BIKE PATH
TURF AREA
INDIVIDUAL PICNIC TABLE, TYP.
PICNIC AREA
PARKING LOT
PLAN LEGEND
SHADE STRUCTURE/ LARGE GROUP PICNIC AREA
FABRIC SHADE CANOPY
BENCHES
BIKE RACKS
6' HIGH CHAINLINK FENCE
BMX TRACK
SWING GATE
DROP-OFF AREA
SKATE PARK (ABOVE GROUND COMPONENTS)
INTEGRATED SPORT COURT
FITNESS EQUIPMENT
MASTER PLAN FOR
GARDENLAND PARK (1.74 ACRES)
CITY OF SACRAMENTO CALIFORNIA



Natomas Oaks Park Master Plan


MASTER PLAN
January 14,2003
Future connection to Garden Highway
Garden arbor
Future proposed road
Existing community garden
Bikeway turn around
Mesh fence with vines
Wood fenced compost area
Orchard area
Existing Ninos Park
Picnic area
Existing concrete bikeway
Seating area
Unpaved utility access road
Natural area with trees/grasses
Entry with post & cable fencing, trees/ groundcover and small shrubs
Ninos Parkway Master Plan



Sandcove Park Master Plan

LEGEND
A MAIN ENTRANCE
B OPEN TURF
C ADVENTURE PLAY AREA
D FUTURE HORSESHOE COURTS
E PICNIC AREA W/ FUTURE SHADE STRUCTURE
F VOLLEYBALL COURT
G GRASS AMPHITHEATER
H DRY CREEK BED
NATURAL AREA
FUTURE BUNCH GRASSES
DECOMPOSED GRANITE
SHREDDED BARK
KITTIWAKE DRIVE
SWAINSON WAY
GARDEN HIGHWAY
MASTER PLAN FOR:
SHOREBIRD PARK
2 Acres
R2003-845
12/2/2003
Shorebird Park Master Plan

Letter	City of Sacramento, Department of Parks and Recreation
L5	J. P. Tindell, Park Planning & Development Manager
Response	August 16, 2010

L5-1 See responses to comment letter L3 and see responses to comments L5-2 through L5-12.

L5-2 Section 2.3.4.2, "Woodland Compensation," of the DEIS/DEIR states that Hansen Ranch is a 420-acre open space area located north of Main Avenue and east of the NEMDC. This area consists of Hansen Park, owned by the City of Sacramento, and the Coyle Property, which is owned by SAFCA. SAFCA has a conservation easement on Hansen Park (the western portion of the Lower Dry Creek area) that already limits future development of the park. However, the conservation easement does permit habitat enhancements, such as tree plantings.

L5-3 See response to comment L3-1.

L5-4 Mitigation Measure 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities," in the DEIS/DEIR requires that the project proponent(s) compensate for loss of parkland and amenities.

L5-5 See responses to comment L3-1.

L5-6 The DEIS/DEIR analyzes the environment impacts, including encroachments on park facilities, of a worst-case levee improvement footprint. Mitigation Measure 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities," of the DEIS/DEIR addresses impacts to park facilities. The actual extent of encroachments by levee improvements on park facilities and the degree to which park facilities may co-locate with flood control facilities, such as seepage berms, would be determined as part of final design.

L5-7 The precise modifications and construction timing for Sump Pump 102 would be determined during final design. To ensure coordination with the City of Sacramento, the following text is added at the end of the 2nd paragraph of Mitigation Measure 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities," of the DEIS/DEIR as follows:

> The project proponent(s) shall compensate for loss of Heritage trees and native oak trees from within the City of Sacramento's public parks and open space areas. Heritage trees shall be replaced in accordance with Sacramento City Code, Title 12, Streets, Sidewalks and Public Places, Chapter 12.64 Heritage Trees. California native trees shall be replaced with like species. Priority shall be given to replacement plantings within the Natomas Basin on public park land or open space/natural areas accessible to the public. Second priority would be replacement in public park areas of North Sacramento located within the City. Project proponent(s) shall consult with City of Sacramento Department of Parks and Recreation regarding the location of compensatory woodland plantings on City property, including but not limited to the City-owned portion of the Hansen Ranch property.

L5-8 See responses to comments L5-3 and L5-4.

L5-9 Mitigation Measure 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities," of the DEIS/DEIR addresses impacts to park facilities.

See responses to comments L5-3 and L5-4. As noted in Table 4.13-1 in the DEIS/DEIR, the levee and operations and maintenance (O&M) corridor and utility corridors would encroach onto the southern edge of the garden. Future plans for bikeway connection to Garden Highway shown in the master plan may need to be modified to accommodate adjacent levee. This would be addressed by the project proponent(s) during consultation with the City regarding compensation for loss of park property and amenities as described in response to comment L5-4.

L5-10 Comment noted. As described in the DEIS/DEIR, the Adjacent Levee Alternative (Proposed Action) would have no impact on the waterside levee at Sand Cove Park. The Fix-in-Place Alternative would remove vegetation, but would not disturb the waterside levee.

L5-11 The location of the utility corridor will be determined during final design, in coordination with the City. Mitigation Measure 4.13-b, "Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities," of the DEIS/DEIR addresses impacts to park facilities.

L5-12 See response to comment L5-3.

L5-13 As noted in response to comment L5-4, USACE and SAFCA will coordinate with the City.

SRCSD

wastewater manag

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July 20, 2010

L6

Elizabeth Holland
Planning Division
USACE Sacramento District,
1325 J Street
Sacramento, CA 95814

Subject: Draft Environmental Impact Report/Draft Environmental Impact Statement for the American River Watershed Common Features Project/Natomas East Levee Improvement Program, Phase 4b Landslide Improvements Project and the Draft Natomas Post-authorization Change Report

Dear Ms. Holland:

The Sacramento Regional County Sanitation District (SRCSD) and Sacramento Area Sewer District (SASD) have reviewed the Draft Environmental Impact Report/Draft Environmental Impact Statement for the American River Watershed Common Features Project/Natomas East Levee Improvement Program, Phase 4b Landslide Improvements Project and the Draft Natomas Post-authorization Change Report and have the following comments:

L6-1

SRCSD currently has critical facilities in operation that serve the entire Northern Sacramento region which are located in the proposed project area. The New Natomas Sewerage Pump Station Force Main crosses under the Sacramento River, near Interstate 80, the Old Natomas Force main is located near the intersection of San Juan and East Levee Road, and The Upper Northwest Interceptor (UNWI) is located near the intersection of Elkhorn Blvd. and East Levee Road.

There needs to be close coordination with SRCSD during the design and construction phases for projects within the vicinity of these interceptors to ensure that this project does not adversely affect these facilities.

If you have any questions regarding these comments, please contact me at (916) 876-9994.

Sincerely,

Sarenna Deeble

Sarenna Deeble
SRCSD/SASD
Policy and Planning

cc: Ruben Robles
Michael Meyer
John Bassett, SAFCA
SRCSD Development Services
SASD Development Services

Letter	Sacramento Regional County Sanitation District
L6	Sarenna Deeble, SRCSD/SASD, Policy and Planning
Response	July 20, 2010

L6-1 Potential impacts to utilities are discussed in Impact 4.15-b, "Potential Disruption of Utility Service," in the DEIS/DEIR and associated mitigation, including the requirement for the project proponent(s) to coordinate with applicable utility providers before construction, is provided in Mitigation Measure 4.15-b, "Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage," of the DEIS/DEIR.

ORGANIZATIONS

O1

909 12th Street Ste 116 Sacramento CA 95814 (916) 444-6600 www.sacbike.org

August 13, 2010

John Bassett, P.E., Director of Engineering
Sacramento Area Flood Control Agency
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RE: Draft EIS/EIR on Phase 4b of the Natomas Levee Improvement Program

Dear Mr. Bassett:

Thank you for the opportunity to comment on the subject Draft EIR/EIS. We continue to be very pleased that the Phase 4b Project DEIR/EIS provides for the possible construction of the Natomas Levee Recreational Trail Project, a 42-mile bicycle and pedestrian Class I facility. However, we fear that many years may pass before actual construction of this trail may even start, let alone be completed and usable for either recreation or commuting. O1-1

The Draft EIR/EIS properly acknowledges that construction of the project will cause temporary (up-to-6-month) disruptions of roadways and trails used by bicyclists and commits to preparation and implementation of Bicycle Detour Plans for each such disruption.

The Draft EIR/EIS fails to identify possible significant adverse impacts of long-term or indefinite interruption of bicycle facilities. Such long-term impacts may occur if the NLIP does not commit to completely reconstruct existing bicycle facilities that are destroyed by construction excavation or filling. These significant adverse impacts may occur at the following locations of existing bicycle facilities (see City of Sacramento Bikeway Master Plan map dated April 2010): O1-2

1. Garden Highway along the American River levee and the lower portion of the Sacramento River levee (to Orchard Lane) where it currently has Class II bicycle lanes,
2. Class I Bike Trail at foot of Sacramento River levee westward from Natomas Oaks Park to the Main Drainage Canal Class I bike trail (this trail is currently an important commuter route from South Natomas towards downtown and will become much more important when the bike bridge over I80 to North Natomas at the junction of the Main Drainage Canal and the East and West Drainage Canals and their Class I bike trails is completed in 2011),
3. Class I Bike Trail at foot of Sacramento River levee westward from Shorebird Park to Marina Glen Way with connections up the slope of

SAFCA '10 AUG 16 PM2:56

American Lung Association Clean Air Award, Sacramento Environmental Commission Environmental Recognition Award, League of Women Voters Civic Contribution Award, League of American Bicyclists Club of the Year

the levee to Garden Highway (an important route for commuters from the western portion of South Natomas), and

4. Ueda Parkway Class I bike trail along the top of the Natomas East Main Drainage Canal west levee (an important commuter and recreational bicycle route between North Sacramento, North and South Natomas, and downtown).

O1-2 (Con't.)

These significant adverse impacts can be reduced to less than significant levels by the commitment of the NLIP 4b project to fully reconstruct and reestablish these important bicycle facilities and connections.

To fully mitigate temporary construction disruptions to bicycle routes, the Bicycle Detour Plans must include (in addition to what is stated in the DEIR/EIS) the following measures:

- Noticing of alternate routes for bicyclists to local bicycle organizations for distribution through their information channels, and
- 25 mph speed limits through the detours.

The Ueda Parkway bike trail currently has limited connections with surface streets in the neighborhoods near which it passes. Reconstruction of the Ueda Parkway bike trail after completion of the levee project should include establishing connections (possibly by paving construction-access ramps) to the following surface streets:

O1-3

- Indiana Ave
- Senator Ave
- Rosin Court
- Tandy Court
- North Market Blvd

SABA is an award-winning nonprofit organization with more than 1400 members. We represent bicyclists. Our aim is more and safer trips by bike. We are working for a future in which bicycling for everyday transportation is common because it is safe, convenient, and desirable. Bicycling is the healthiest, cleanest, cheapest, quietest, most energy efficient, and least congesting form of transportation.

Thank you for considering our comments.

Yours truly,

Walt Seifert for

Jordan Lang
Project Assistant

Cc: Ed Cox, City of Sacramento Alternate-Modes Coordinator
Dan Klinker, Sacramento County Bicycle Coordinator

Letter O1 Response

Sacramento Area Bicycle Advocates
Jordan Lang, Project Assistant
August 13, 2010

O1-1 Comment noted.

O1-2 Table 3.13-1 is revised as follows:

Table 3.13-1
Recreational Facilities and Park Lands in the Natomas Basin, including the Phase 4b Project Area

Facility (Owner/Operator)	Location	Features
Garden Highway Bikeway	Reach I:1–2 of the American River north levee and Reach A:19B and 20 of the Sacramento River east levee. The Class I bikeway is adjacent to Garden Highway, on the waterside of the levees between Natomas Park Drive and Gateway Oaks Drive. The trail crosses Garden Highway, enters the Natomas Oaks Park, and continues parallel to the levee on the landside to the NEMDC. The bikeway turns north at this point and follows the NEMDC. See **Plate 2-21**, "Bike Trail Concepts"	1.25-mile trail from Natomas Park Drive to Natomas Main Drainage Canal
Ueda Parkway (City of Sacramento Department of Parks and Recreation)	On the crown of NEMDC west levee between Arden Garden Connector and Elkhorn Boulevard, Dry Creek, and Robla Creek	12.5 miles of paved recreation trails primarily on levee crowns, providing access to the natural habitat of Steelhead, Arcade, Dry, and Robla Creeks. The parkway also has approximately 3.5 miles of equestrian trail in the Hansen Ranch area, which includes Dry Creek, Robla Creek, wetlands, and oak woodlands. Provides a connection to American River Parkway and downtown Sacramento, with neighborhood access points at various locations; facilities include a Class I bike trail along the crown of the NEMDC

Table 4.14-1 is revised as follows:

Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

Facility (Owner/Operator)	Location	Park Amenities	Temporary and Short-term Impacts	Permanent Impacts
Ueda Parkway (City of Sacramento)	On the crown of the NEMDC west levee between Arden-Garden Connector and Elkhorn Boulevard, along Dry Creek, and Robla Creek east of the NEMDC	12.5 miles of paved recreation trails primarily on the levee crowns; connection to American River Parkway and downtown Sacramento; neighborhood access points at various locations; facilities include a Class I bike trail along the crown of the NEMDC	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Erosion repair, waterside repairs, and repairs at City of Sacramento Sump Pump 102 would require temporary closures of the bike trail on the NEMDC levee crown. The bike trail would be demolished at the construction locations and reconstructed.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Vegetation removal (including potential removal of Heritage oak trees) on the waterside of the west levee of NEMDC south would adversely affect the recreational experiences for passive users (birdwatchers, fisherman, and hikers) of the Parkway.
Garden Highway Bikeway	Waterside of the American River north levee in Reaches I:1 and I:2 and on the waterside and landside of the Sacramento River east levee in Reach A:20	1.25-mile trail from Natomas Park Drive to Natomas Main Drainage Canal; the trail follows the Natomas Main Drainage Canal north from the Sacramento River east levee Reach A:19B and 20	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Portions of the Bikeway located on the levee crown on the south side of Garden Highway on the American River north levee Reach I:1–2 and Sacramento River east levee Reach A:20 would be temporarily affected by construction closures and may need to be reconstructed upon completion of construction.	Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: In Reach A:20 on the landside of the levee between Natomas Oaks Park and the NEMDC, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative (O&M corridor) would encroach on the Bikeway. Following construction of the Fix-in-Place Alternative, the Bikeway could be replaced in the O&M corridor. Fix-in-Place Alternative: Removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee in Reach A:20 and American River north levee in Reach I:1–2 would diminish the quality of the recreational experience for users of the Bikeway in these areas.

Mitigation Measure 4.13-c(1), "Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair Damage to Recreational Facilities," of the DEIS/DEIR will reduce temporary impacts to bicycle routes to a less than significant level because construction-related damage will be repaired or reconstructed; access restored; and detour routes, roadway markings to designate temporary bike lanes, and informational signs will be provided. Specific details and coordination efforts related to reconstruction of bicycle routes will be determined during final planning, engineering, and design.

To the extent feasible, the reconstructed roadway and any associated bicycle facilities would meet City of Sacramento or Sacramento County roadway design criteria, depending on the jurisdiction.

O1-3 As described above in response to comment O1-2, implementation of Mitigation Measure 4.13-c(1), "Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair Damage to Recreational Facilities," in the DEIS/DEIR would reduce temporary impacts to bicycle routes to a less than significant level because construction-related damage would be repaired or reconstructed; access would be restored; and detour routes, roadway markings to designate temporary bike lanes, and informational signs would be provided. Because consultation with the County and/or City of Sacramento Bicycle and Pedestrian Coordinator, as applicable, is included as part of this mitigation measure, noticing requirements and speed limits of detours will be based upon guidance from the relevant local agency.

USACE and SAFCA are not responsible for construction of bikeways or the establishment of connections from existing bikeways to surface streets. Although the Natomas Levee Recreational Trail Project is included as part of the Phase 4b Project description, further environmental review (i.e., CEQA) is likely to be required as design plans and specifications are developed.

O2

Henningsen, Sarah

From: Bassett. John (MSA) [bassettj@SacCounty.NET]
Sent: Monday, August 16, 2010 2:36 PM
To: Dunn, Francine; Henningsen, Sarah
Subject: FW: DEIS/DEIR Comments due 8/16/10

-----Original Message-----
From: Frederick Weiland [mailto:flweiland@yahoo.com]
Sent: Monday, August 16, 2010 1:57 PM
To: Elizabeth.g.holland@usace.army.mil; Bassett. John (MSA)
Cc: Baker. Janet (MSA); rstork@friendsoftheriver.org; Warren V. Truitt
Subject: DEIS/DEIR Comments due 8/16/10

Dear Ms. Holland,

Save The American River Association (SARA) was founded in 1961 to establish The American River Parkway and remains today as the guardian of and advocate for its lands and waters.

Since we are already on record in a letter dated June 3, 2010, as opposing the U.S. Army Corps of Engineers' nationwide policy to require state and local flood control agencies to remove trees, shrubs, and woody vegetation from flood protection levees and adjacent areas, SARA will confine its comments here to the DEIS/DEIR evaluating the potentially significant environmental impacts of the Phase 4b Project, Reach I: 1-4. O2-1

1. Please confirm our understanding that Reach I: 1-4 is included in the conditional variance granted SAFCA thereby avoiding the removal of significant waterside riparian vegetation that would have resulted in severe impacts to the environment and on users of the American River Parkway. In fact, only the landside vegetation of Reach I: 1-4 is slated for removal except as noted in 2. O2-2

2. It is our understanding that the removal of no more than 28 trees on the NEMDC at the Arden Garden/Northgate Boulevard location (between Jefferson and Harding Avenues to be exact), in an area of the Parkway designated Protected Area, will be mitigated at a ratio of 3 to 1. This mitigation will be installed at least one to two years before the loss of the 28 trees, and the mitigation will be fully monitored to insure its success as replacement SRA. The mitigation site is located on the NEMDC between Rimmer and Tanaya Avenues. Please note that this mitigation does not compensate the Public for the loss of habitat and natural amenities within The American River Parkway. The DEIS/DEIR should address some form of compensation for degradation occuring within a Federal, State and County protected Park and River. O2-3

3. The DEIS/DEIR lists Discovery Park as a potential staging area for the levee improvements. Since the exact location within Discovery Park is not specified in the environmental document, please note that we will request further environmental analysis if a site location is chosen that may have impacts on the plants, animals and birds who rely on the River and Parkway lands. O2-4

Thank you for the opportunity to comment regarding potential impacts of the Phase 4b Project, Reach I: 1-4, on The American River Parkway. For our records, please confirm that you received these comments by the DEIS/DEIR deadline of August 16th, 5:00 p.m. SARA looks forward to the courtesy of your response.

Sincerely,

1

Betsy Weiland, Co-Chairman
Land Use Committee
Save The American River Association
4950 Keane Drive
Carmichael, California 95608

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2

Letter	Save the American River Association
O2	Betsy Weiland, Co-Chariman, Land Use Committee
Response	August 16, 2010

O2-1 Comment noted.

O2-2 See response to comment F2-2. All but a 0.4-mile stretch of the NEMDC was approved under the vegetation variance approval granted on June 16, 2010. Reach I:1–4 of the American River north levee is included in the USACE-granted variance (see Appendix I of the Natomas PACR).

O2-3 The exact number and location of trees to be removed will be based upon final detailed plans and specifications, which will be developed if and when the Phase 4b Project is approved.

Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the ESA, Section 2081 of the CESA, and Section 1602 of the California Fish and Game Code," of the DEIS/DEIR provides replacement ratios to reduce Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats," of the DEIS/DEIR. The habitat improvements from mitigation implementation would reduce long-term impacts to landside woodland habitats loss to a less-than-significant level. However, this impact would remain significant and unavoidable for many years before reaching a less-than-significant level because replacement plantings would require a minimum of 10–15 years before providing important habitat components such as shade and structure and decades to replace old growth trees, such as Heritage oaks.

Timing of replacement will be determined in coordination with DFG, NMFS, and the U.S. Fish and Wildlife Service (USFWS).

Impact 4.3-c, "Inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act," in the DEIS/DEIR addresses the impact to the American River Parkway from removal of vegetation.

O2-4 Comment noted. In the case that new environmental impacts or substantially greater environmental impacts are identified, due to project changes or new information, USACE and/or SAFCA would prepare further environmental analysis as required by State CEQA Guidelines, CCR Section 15162 and National Environmental Policy Act (NEPA) CEQ Regulation 1502.9.

O3

SACRAMENTO TREE FOUNDATION

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August 16, 2010

Elizabeth Holland, Planning Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

Re: Public Comment on the Draft Environmental Impact Statement/Draft Environmental Impact Report on the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project

Dear Ms. Holland,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) for the Natomas Levee Improvement Program, Phase 4b.

The Sacramento Tree Foundation appreciates the analysis made in the DEIS/DEIR addressing the preservation of as much waterside woodland as possible, thus reducing the impact to shaded riverine aquatic habitats. We understand the concept that the adjacent levee provides extra levee integrity with a redundant solution if the original levee should fail. This solution is a response to the Army Corps of Engineers' (Corps) perspective and policy that waterside and landside vegetation threatens the stability of levees.

While we appreciate the efforts made to preserve the waterside vegetation and trees, the basic premise of this approach – that trees on levees threaten the stability of levees – is flawed. It has not been proven that vegetation or trees weaken levee integrity. On the contrary, a 2001 report from the Engineer Research and Development Center (ERDC), which is the US Army Corps of Engineers' distributed research and development command, states: O3-1

"...Riparian vegetation helps stabilize banks, which is valuable because otherwise expensive structures would have to be built to stabilize the bank." [1]

The same report further states:

"The stabilizing benefits of vegetation can be a strong inducement for their incorporation into flood control projects. Leaves and stems of plants intercept rainfall and reduce surface erosion both from runoff and from overbank flooding. Vegetation, primarily woody plants, also helps to prevent mass movement, particularly shallow sliding in slopes." [2]

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"..healthy riparian vegetation also stabilizes streambanks, provides shade that prevents excessive water temperature fluctuations, performs a vital role in nutrient cycling and water quality, improves aesthetic and recreational benefits of a site, and is immensely productive as wildlife habitat. For these reasons, the incorporation of vegetation in stream restoration and flood control projects is often desirable.."[3]

"Flood attenuation is increased in vegetated riparian systems. As is the case for maintenance of stream morphology, the resistance of vegetation to flow is an important attribute for flood attenuation. The area that vegetation presents to flow is proportional to resistance (measured as Manning's n) and effectiveness at reducing flow velocity. This presented vegetational area of vegetation increases directly with increased stem size and density. Trees are most effective at resisting flow."[4]

Furthermore, on page 2-8 in the DEIS/DEIR, it is shown that in the past the Corps allowed vegetation to remain on levees and that during two subsequent floods, there was no evidence of instability or threat to safety:

"However, with the concurrence of USACE and the State, to minimize the project's environmental effects, trees were allowed to remain in the maintenance area along the landside toe of the improved levee and along the waterside slope of the levee and waterside berm. It was felt that these trees would not impair the performance of the improved levee because there was adequate visibility of and access to both sides of the levee to conduct routine maintenance and flood fighting activities. Nor was there any significant concern regarding the impact of the remaining trees on the safety or structural integrity of the improved levee. Although nearly overtopped and subjected to prolonged high flow during the flood of 1986, the old levee had performed well with few signs of stress. With its increased height, the new levee performed even better during the flood of 1997. However, this levee is no longer considered in compliance with USACE levee vegetation guidance, and avoidance of landside tree clearing in this maintenance area would require a variance from USACE.

O3-1 (Con't.)

The California Department of Water Resources, in their letter of April 15, 2010 regarding the Corps' vegetation variance policy:

"Whereas overtopping, underseepage, through-seepage, erosion and other high-risk modes of failure are well-documented in the Central Valley, we have not seen evidence that well-managed vegetations poses significant risks. We are not aware of any levee failures in the Central Valley that were caused by woody vegetation on levees, and interim studies suggest that woody vegetation has negligible detrimental effects on levee performance as well."

Bio-stabilization of levees is common practice in Europe and gaining ground in other parts of the world.[5] Given the scarcity of trees in California's Central Valley and the severe reduction in wildlife habitat already inflicted on the region, we believe a

policy of "clearing, grubbing, and stripping" levees is irresponsible and will cause irreparable, long-term harm to the environment as well as to our citizens given the air and water quality benefits of trees, -- to say nothing of the great economic cost to implement such a policy.

In the Corps' Engineering Technical Letter 1110-2-571, the benefits of landscape planting mentioned include dust and erosion prevention, water quality and wildlife habitat, and creating a pleasant environment for human use and recreation. But the benefits of trees with respect to our citizens go far beyond this list as shown below:

- Trees are a significant factor in reducing air pollution by means of nitrous oxide deposition, sulfur dioxide absorption, ozone interception, and particulate matter interception. 100 trees can remove 1,000 pounds of pollutants per year, including 400 pounds of ozone and 300 pounds of particulates.[6] Recent research shows the increasing public health threats of ultrafine particulate matter from car exhaust.
- On an annual basis, 100 trees can remove 5 tons of carbon dioxide from the atmosphere.[6] Large trees are the most effective for long-term carbon storage.
- In semi-arid California, trees catch and hold rainfall, which delays stormwater runoff and reduces flooding. A large deciduous tree can intercept between 500 and 760 gallons of water per year. A mature evergreen can intercept more than 4,000 gallons per year, depending on species and rainfall characteristics.[7] Preventing stormwater runoff improves water quality and water availability at the local level. Tree canopies reduce soil erosion by diminishing the impact of rain on barren surfaces.
- Plants clean the soil and water by removing contaminants such as metals, pesticides, crude oil, polycyclic aromatic hydrocarbons and more through the process known as phytoremediation. Tree species commonly used for phytoremediation include willow, poplar (cottonwood hybrids), and mulberry, because they have deep root systems and are able to control the movement of pollutants by consuming large amounts of water. Willow and poplar are the typical species for riparian woodland in Sacramento. While pollutant removal rates vary greatly, one study estimated that one sugar maple growing along a roadway removed 60 mg of cadmium, 140 mg of chromium, 820 mg of nickel, and 5,200 mg of lead from the environment during a single growing season.[8]
- In urban areas, such as the Natomas Levee in Sacramento, an increase in tree canopy can reduce the urban heat island effect by reducing ambient temperatures by 3 – 5 degrees Fahrenheit.[9]

We urge the Corps to re-consider well-established alternative methods of bio-stabilization on levees in order to preserve our limited environmental resources. If current research and empirical data are somehow insufficient, we again urge the Corps to expedite the research needed to determine the impact of trees and

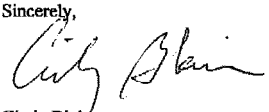
O3-1
(Con't.)

vegetation on levee stability. Please take the time to fully consider these alternatives before implementing a policy of clearing, grubbing, and stripping in the West.

O3-1 (Con't.)

The Sacramento Tree Foundation believes that we can reach a better solution by working with a broad range of agencies and concerned citizens – a solution that will address our urgent environmental, levee stability, and human health concerns. Thank you very much for your consideration.

Sincerely,



Cindy Blair
Operations Director
Sacramento Tree Foundation

1. Environmental considerations for vegetation in flood control channels. J. C.Fischenich, and R. R. Copeland. ERDC. TR-01-16, U.S. Army Engineer Research and Development Center, Vicksburg, MS. 2001. Page 3.
2. *Ibid.* Page 57-58.
3. *Ibid.* Page 3.
4. *Ibid.* Page 68-69.
5. *Ibid.* Page 57 and the article **"City to plant trees to help prevent dyke, bank erosion" Viet Nam News,** June, 16 2010. "During the 2011-15 period, the city will plant additional 810,000 trees along 112km of sea dykes, river and canal banks in the coastal district... City officials said the project was being undertaken because of the general ineffectiveness of various flood prevention programmes, on which the city had spent more than VND200 billion ($10.5 million) each year since 2008."
6. Tree Guidelines for San Joaquin Valley Community. E.G. McPherson et al, USDA Forest Service, Pacific Southwest Research Station, Center for Urban Forest Research. Davis, CA. 1999.
7. Benefits of the Urban Forest: Fact Sheet #1. USDA Forest Service, Pacific Southwest Research Station, Center for Urban Forest Research. Davis, CA. 2001.
8. Identified Benefits of Community Trees and Forests. K. Coder, University of Georgia. Athens, GA. 1996.
9. Energy Saving Calculations for Heat Island Reduction Strategies in Baton Rouge, Sacramento, and Salt Lake City. S. Konopacki and H. Akbari. 2000.

cc: John Bassett, Director of Engineering, Sacramento Area Flood Control Agency

Letter	Sacramento Tree Foundation
O3	Cindy Blain, Operations Director
Response	August 16, 2010

O3-1 On February 9, 2010, USACE posted a notice in the *Federal Register* (Vol. 75, No. 26) requesting comments on the Finding of No Significant Impact and draft Environmental Assessment on the *Process for Requesting a Variance From Vegetation Standards for Levees and Floodwall*. The comment period closed on April 25, 2010 (which was an extension from the original date of March 11, 2010). USACE is currently in the process of responding to comments and making a decision on the NEPA document.

O4

Henningsen, Sarah

From: Holland, Elizabeth G SPK [Elizabeth.G.Holland@usace.army.mil]
Sent: Wednesday, August 18, 2010 6:44 AM
To: Henningsen, Sarah; Dunn, Francine
Subject: FW: Phase 4b Draft EIR/EIS Comments
Attachments: GHCA NLIP Phase 4b NOP Comments.pdf

NOP comment attached.

Elizabeth Holland
U.S. Army Corps of Engineers
Senior Environmental Manager
(916) 557-6763 Cell (916) 524-8239
e-Mail Elizabeth.g.holland@usace.army.mil

-----Original Message-----
From: Gibson Howell [mailto:gib@mail.com]
Sent: Tuesday, August 17, 2010 6:22 PM
To: bassettj@saccounty.net; Holland, Elizabeth G SPK
Cc: Barbara Gualco; Buer. Stein (MSA); David Ingram
Subject: RE: Phase 4b Draft EIR/EIS Comments

Liz and John,

Could we please include our GHCA comments to the Phase 4b "NOP" to the Draft Phase 4b comments? As far as we can tell nothing has changed, so our comments remain the same. The only thing we would like to add is that we are very encouraged the USACE has granted the "Vegetation Variance" for the NLIP and that the USACE will abide by the "Settlement Agreements" between SAFCA and GHCA.

As unpaid volunteers for our community it is very difficult to decipher the 1000's of pages of EIR/EIS's that have been generated year after year by very well paid consultants. Trying to do this with hundreds of individually downloaded files that are not 'hyperlinked' makes this even more onerous. The paper documents are the only reasonable way to compare any changes between Phase 1, Phase 2, Phase 2 (supplemental), Phase 3, Phase 4a, and Phase 4b (each document more than 1000 pages long, not including appendixes).

O4-1

Both the USACE and SAFCA websites only offer the "Draft Phase 4b" document in 17 multiple megabyte files that are not easily cross-referencable or 'hyper-linked'. In previous EIR/EIS's the entire document could be downloaded and seen as 'one entire document'. Trying to understand the scope and impact on our community is all but impossible with this segmented approach.

We only obtained a 'paper copy' of the Draft Phase 4b document on Friday the 13th, the weekend before the deadline. It took many calls, but thanks to SAFCA, they loaned us the only copy they had.

We respectfully request you incorporate the GHCA Phase 4b "NOP" comments to the "Draft Phase 4b EIR/EIS" comments.

Thank You,

1

Gibson Howell
President, Garden Highway Community Association

-----Original Message-----
From: Holland, Elizabeth G SPK
[mailto:Elizabeth.G.Holland@usace.army.mil]
Sent: Monday, August 16, 2010 2:13 PM
To: gib@mail.com
Subject: RE: Phase 4b Draft EIR/EIS Comments

Gib - I was trying to call you but got tied up in other phone calls and meetings this morning.

We are not providing extensions on this Phase as we must get the responses to comments completed and out to meet a deadline for congressional authorization. Please provide your comments to us today as we are now working through the responses. Sorry but we have to meet these deadlines to get authorization and funding this year.

I am not attending the meeting today - that is our levee safety section that deals with encroachments.

Elizabeth Holland
U.S. Army Corps of Engineers
Senior Environmental Manager
(916) 557-6763 Cell (916) 524-8239
e-Mail Elizabeth.g.holland@usace.army.mil

-----Original Message-----
From: Gibson Howell [mailto:gib@mail.com]
Sent: Monday, August 16, 2010 12:56 PM
To: Holland, Elizabeth G SPK
Subject: Phase 4b Draft EIR/EIS Comments

Liz,

Hello and hope all is well!

The GHCA was trying to generate our comments on Phase 4b using the website documents, but there are so many different files and they are so large it was proving to be near impossible. We just obtained a paper copy of the 4b Draft EIR/EIS last Friday and have been working on the GHCA comments this weekend. Can we please get an extension to file comments until either tomorrow (17th) or Wednesday (18th)? Any extension would be greatly appreciated.

Thank You,

Gibson Howell
GHCA

p.s. Will we be seeing you at the GHCA/SAFCA/USACE/CVFPB/RD1000 meeting today?

2

Garden Highway Community Association
2701 Del Paso Road, #130-231
Sacramento, CA 95835

December 4, 2009

John Bassett, Director of Engineering
SAFCA
1007 7th Street, 7th Floor
Sacramento, CA 95814

AND

Elizabeth Holland, Planning Division
U.S. Army Corps of Engineers
1325 J Street, Room 1480
Sacramento, CA 95814

RE: Comments on Phase 4b "Notice of Preparation"

SAFCA and US Army Corps of Engineers:

The Garden Highway Community Association (GHCA) is an incorporated community association whose membership includes nearly all waterside and landside property owners along the Garden Highway in the area addressed in SAFCA's Natomas Levee Improvement Program (NLIP). The GHCA supports increased flood protection for the Natomas Basin, as long as it is done in a fiscally responsible, environmentally conscious, and scientifically sound manner. At the same time, as most GHCA members live on or next to the NLIP, they have an enormous interest and concern in how this project is implemented.

Below is a list of comments and concerns regarding the Phase 4b Notice of Preparation.

1. <u>Failure to Adequately Consider Alternative Designs</u>

SAFCA and the USACE have failed to conduct a legitimate, unbiased study to determine the most economically and environmentally sound project design to bring the Natomas Basin up to the USACE 100 year flood protection standard. SAFCA and the USACE have summarily dismissed feasible alternatives that would lead to region-wide solutions to the flooding potential in the Natomas Basin and surrounding communities. They have also failed to make a rationale, "good faith" effort at minimizing the height and footprint of the adjacent levee system, especially in light of the lower and inferior levee systems both upstream and adjacent to the NLIP. Therefore, the project is not in compliance of CEQA and NEPA requirements. O4-2

Pursuant to the applicable environmental laws, the agencies responsible for this Project must rigorously explore and objectively evaluate all reasonable alternatives and must devote substantial consideration to each alternative consideration.

Notably, during a recent SAFCA Board meeting which discussed the Project, it was repeated several times that the levee improvement design is a "work in progress" and that certification of ongoing EIS phases was a "worst case scenario" for the environment and property rights. Unfortunately, current environment destruction adjacent to Garden Highway does not correlate with these "work in progress" and "worst case scenario" portrayals. Rather, SAFCA and its contractors are in a race to remove highly sensitive habitat within the ENTIRE project footprint, despite the fact that alternative, less obtrusive levee improvement designs are gaining momentum and the fact that the Project is facing insurmountable fiscal problems.

O4-2 (Con't.)

The GHCA strongly encourages SAFCA and the USACE to look outside the Project's predestined box and not "clear a construction path" through sensitive habitats and rich farmland based upon "worst case" design scenarios. There are obviously countless alternative designs that would accomplish the flood protection our region needs at a fraction of the monetary, environmental and property-loss cost. For example, simply narrowing the footprint of the "seepage berms" would result in mammoth savings in all three of these areas. These berms, designed to be 500 feet wide in some areas, are unprecedented in our region and seem highly unwarranted when compared to the existing 10-20 foot berms that previously handled several 100-year-floods (without the cut-off walls that will be added as a part of this project). More telling, as evidenced by design concessions to certain property owners, SAFCA and the USACE have shown by their own actions that the footprint of the seepage berms can be substantially narrowed without losing the flood protection it seeks.

CEQA also requires a realistic analysis of the existing physical environmental conditions affecting the Project. Several court decisions have determined that the impacts of a proposed project must be measured against the "real conditions on the ground." Save Our Peninsula Committee v. Monterey County Board of Supervisors (2001) 87 Cal.App.4th 99, 121. "An EIR must focus on impacts to the existing environment, not hypothetical situations." ibid. In determining whether a project's impacts may significantly affect the existiug environment, there must be a "baseline" set of environmental conditions to use as a comparison to the anticipated project impacts. As the Court of Appeal has explained, "it is only against this baseline than any significant environmental effects can be determined." County of Amador v. El Dorado County Water Agency (1999) 76 Cal.App.4th 99, 952.

O4-3

Despite these requirements, the plans for this Project fail to describe the existing physical environmental conditions in order to determine the Project's significant adverse impacts on the existing environment. Conversely, the entire NLIP design relies upon a computer simulation that describes a hypothetical physical condition, but does not describe the actual physical conditions on the ground, including the current condition of the west side levees along the Sacramento River and the north side levee along the Natomas Cross Canal. This comparison would answer the question of "levee parity" and whether any spots along the river side of the east levee improvements or west side of the Sacramento River in Yolo County, or north side of the Natomas Cross Canal in Sutter County, would be more vulnerable to flooding.

In other words, if the east side levee along the Sacramento River has sufficient freeboard to ensure safe containment of the "200-year" design water surface, then these improved levees will have a significant adverse effect on the existing lower levee, properties, and structures along the west side of the Sacramento River as well as the homes and residents along Garden Highway on the river side of the improved east side levees. O4-3 (Con't.)

The failure to evaluate the impact of a Project on the existing physical environmental conditions frustrates "the central function of the EIR, to inform decision makers about the impacts of the proposed project on the existing environment." Save Our Peninsula Committee, supra, 87 Cal.App.4th at p. 127.

The Project's plans further fail to consider the impacts of mounting environmental legislation and biological opinions which will significantly impact alternative flood protection plans, summarily dismissed by SAFCA as "impossible" or "inconceivable." One such edict recently issued by the The National Marine Fisheries Service unveiled a complex set of rules, a "biological opinion", which will likely have enormous impacts on local flood protection practices with the goal of increasing the populations of winter and spring-run salmon, Central Valley steelhead and green sturgeon. According to Kate Poole, attorney at the Natural Resources Defense Council, "There's no question any more about the fact that the Bay-Delta ecosystem is in dire need of significant changes and fixes. This is one big step to do that." O4-4

The new federal rules require that reclamation districts find a way to flood the Yolo Bypass more often to improve salmon habitat, negating SAFCA's argument that the Yolo Bypass could not be used to divert more water from the Sacramento River than current rules permit. Moreover, SAFCA's concern that water diversion to the Yolo Bypass would be too costly to local water and flood agencies apparently did not negate the decision on the new rules. The ruling governs water operations of the California Department of Water Resources, who will share the cost of the new orders. Clearly, flooding the Yolo Bypass "more frequently" will require a lowering of the Sacramento River weirs – a proposal made by the GHCA during 2007 as a more effective, long-term solution in lieu of an eternal levee battle in the narrow channels of the Sacramento River.

2. Failure to Adequately Consider and Protect Wildlife

The United States Environmental Protection Agency has previously commented on the NLIP, noting its continued concern over the temporary and permanent effects the Project is expected to have on the waters of the United States and recommended the continued "close consultation and collaboration" with the U. S. Fish and Wildlife Agency, California Department of Fish and Game and The Natomas Basin Conservancy to "ensure effects on woodlands, threatened and sensitive species habitat and waters of the US are avoided and minimized." Overall, this Agency has previously classified prior EIS drafts associated with the NLIP as "Insufficient Information (EC-2)". O4-5

The California Department of Fish and Game "DFG" has also expressed serious concern regarding the environmental impacts of the NLIP: O4-6

- The DFG believes pertinent mitigation measures are potentially unenforceable and may not bring the impacts to fisheries and aquatic resources to below a level that is significant.

- The DFG has found transplantation of herbaceous plants is typically unsuccessful and should be considered experimental. Mitigation measures for any potentially unavoidable impacts to special-status plants should include additional measures to increase the chances of survival for the population in question. Mitigation sites should be permanently protected and managed in perpetuity.

- The DFG is concerned with potential impacts to raptor nesting behavior not currently addressed in the DEIR, especially with regard to 24/7 construction and an estimated 900-1000 haul trips per day to deliver fill material. The DFG "believes that each of these activities could potentially result iu significant impacts to nesting raptors including nest abandonment, starvation of young, and/or reduced health aud vigor of eggs or nestlings that could result in death." O4-6 (Con't.)

- In their current form, the DFG opines that the environmental documents do not explore the potential impacts of nighttime construction activities on nesting raptors. Moreover, construction at night poses additional complications for the effectiveness of biological monitors in ensuring that appropriate buffer zones are in place around active nests and that birds do not abandon their nests.

- The DFG has noted that prior DEIRS do not provide a discussion of potential impacts to the Northern Harrier, a ground nesting raptor and does not consider avoidance or mitigation measures.

The GHCA further notes the NLIP purports to mitigate the loss of woodland habitat by the promise to create three acres of canopied woodlands for every one acre destroyed. This mitigation goal is fatally flawed in that there is no discussion, explanation and/or plan to address the environmental tragedy that will result from the 50 to 100 year period required for the "new" woodland habitat to be developed – assuming the planned mitigation goal is even reached. O4-7

Despite the failure to mitigate the significant adverse impacts resulting from the destruction of woodland habitat, and the lack of necessary funding to effect the planned mitigation related thereto, SAFCA and its contractors are currently proceeding with the destruction of woodland habitat and the clear-cutting of heritage oaks and other trees.

Further, the NLIP also proposes to utilize lands purchased by the Natomas Basin Conservancy ("Conservancy") as borrow areas. These borrow areas will provide the base material for the landside levee improvements on the south side levee along the Natomas Cross Canal and the east side levee along the Sacramento River. Despite SAFCA's proposed use of these lands, the Conservancy acquired these properties to offset urban development's significant adverse impacts on protected wildlife species withiu the Natomas Basin. The Conservancy acquires and manages these properties consistent with the Natomas Basin Habitat Conservatiou Plan. The GHCA believes there still is no agreement between the Conservancy and SAFCA on the use of Conservancy lands and how these lands will carry out their intended conservation purpose after the soil necessary for the construction of the levee improvements is removed. Thus, any claimed mitigatiou for the loss and disturbance of Conservancy land is impermissibly deferred to some future time after Project approval and implementation. O4-8

Despite the fact that the Project's agencies have been afforded several bites at the apple in an attempt to come up with acceptable environmental mitigation, it continues to gloss over the devastating impact the O4-9

Project will have on the sensitive habitat of protected species, including raptors, snakes and flora (see comments of the California Department of Fish and Game summarized above). O4-9 (Con't.)

3. Failure to Study Simultaneous Multi-Phase Construction

SAFCA, and now the USACE, are currently postulating that multiple phases of the NLIP could be constructed simultaneously. This directly contravenes the construction impact and mitigation advanced in the prior environmental documents and creates new issues not previously studied or addressed. For example, there would be compounded effects of CO2 emissions, noise, dust, vibration, and disruption to wildlife that has not been analyzed. Compared to the original Phase 3 EIR, for example, emissions in just Sacramento County would raise from ROG 75 lb/day to 287 lb/day, NOX 413 lb/day to 1,476 lb/day, and PM10 971 lb/day to 3,847 lb/day if these phases are to be done simultaneously. Moreover, on page ES-16, "Air Quality," the Phase 3 DEIR references the "nonattainment status of the Feather River Air Quality Management District and the Sacramento Metropolitan Air Quality Management District for ozone and PM10." The GHCA contends the cumulative effect of simultaneous construction during multiple construction phases has not been sufficiently analyzed by the responsible agencies. O4-10

Furthermore, simultaneous construction could involve three or more phases of simultaneous, 24/7 construction. Given the grave impacts of just one 24/7 worksite, the GHCA believes SAFCA and the USACE certainly cannot justify multiple worksites operating in this manner. This impact would make the simultaneous Phases (2, 3, 4a, 4b) unreasonably harmful to wildlife, the environment, and Garden Highway residents. O4-11

4. Failure to Adequately Address Encroachments/Levee Prism

At page 7 of the NOP, Encroachment Management, the following proposed action appears: "Remove encroachments as required to meet the criteria of the USACE, CVFPB, and FEMA." Conversely, the Sacramento Division of USACE and SAFCA have repeatedly advised members of the GHCA that the "adjacent" levee adopted by the NLIP "should" remove the waterside trees, landscaping, fencing, and other vegetation and improvements from the "levee prism." In other words, these agencies believe implementation of the NLIP would spare these items from removal under even the most aggressive encroachment standards. Thus, the GHCA is concerned with the apparent unchanged position regarding encroachments as described in the current NOP. O4-12

Of utmost importance to property owners along Phase 4b, the USACE does not mention how they will treat vegetation and encroachments on either side of the levee where they decide not to build an "adjacent setback levee" and thus achieve a new levee prism. If a "one size fits all" approach of denuding levees is applied, it will completely contradict the long established local USACE procedures of planting trees to stabilize the levees, protect endangered wildlife and reduced wind-driven waves. We have also been told that many members of the scientific community believe trees and other vegetation improves the strength of a levee, especially in areas of the country that do not have to contend with hurricane strength winds. What are USACE's current views on this?

It also does not appear the USACE has identified what (if any) waterside encroachments will be subject to removal within the NLIP and what legal processes will be involved in condemnation of associated property rights. These questions are of utmost importance to the GHCA and its members. SAFCA has O4-13

also advised the GHCA it has maps of approximately 30,000 encroachments and all associated easements on the waterside of the levee. SAFCA recently revealed this database to the public, but there is no mention of the encroachments and/or vegetation that the involved flood agencies consider to be unacceptable. Research has revealed some vague, inadequately mapped easements dating back to the early 1900's which appear to show little or no support for any planned encroachment removal.

SAFCA has also stated "on the record" it is willing to help facilitate "post-facto" permits for encroachments that do not endanger the levee. Would the USACE also be willing to endorse this procedure? Unfortunately, because the property owners have no information as to what items SAFCA and the USACE feel are acceptable encroachments, Garden Highway properties are being left in the dark. O4-13 (Con't.)

Overall, the members of the GHCA are very concerned about which "encroachments" might require removal and with the various easements SAFCA and/or its partners will attempt to claim. SAFCA has promised to work with each property owner to discuss and resolve issues regarding alleged encroachments, but thus far has taken no such action. Does the USACE plan on doing the same for Phase 4b? Currently, construction Phase 2 of the Project is underway, yet the GHCA is aware of no affected property owners having been contacted regarding encroachment or easement plans. This not only impacts existing improvements, but future improvements. The uncertainty also creates resale problems and negatively affects property values.

5. <u>Failure to Justify 24/7 Construction</u>

As accurately noted by the California Department of Fish and Game, previous EIRS/NEPA documents do not adequately address the potential impacts to raptor nesting especially with regard to 24/7 construction and an estimated 900-1000 haul trips per day to deliver fill material. The DFG "believes that each of these activities could potentially result in significant impacts to nesting raptors including nest abandonment, starvation of young, and/or reduced health and vigor of eggs or nestlings that could result in death." Moreover, the NOP does not explore the potential impacts of nighttime construction activities on nesting raptors. Moreover, construction at night poses additional complications for the effectiveness of biological monitors in ensuring that appropriate buffer zones are in place around active nests and that birds do not abandon their nests. O4-14

The NOP contends Cutoff Walls, wells and perhaps additional aspects of the Project require a 24/7 construction schedule. The residents along Garden Highway and the sensitive environment that exists in the riparian, river habitat adjacent thereto cannot be subjected to 24/7 construction simply because SAFCA or the USACE is running behind schedule on what might be perceived as an overly ambitious project. It is anticipated 24/7 construction during subsequent phases of the NLIP would have an exponentially adverse impact on property owners spanning many miles in all directions. Moreover, the use of trucks to get to and from the actual "construction" sites will expand the location of the impact far beyond the limited construction sites addressed by SAFCA and this NOP. O4-15

The GHCA also feels the NOP ignores both city and county (Sacramento and Sutter) noise ordinances. As such, the GHCA seeks an explanation as how the USACE plans to deal with violations of local noise ordinances.

6. Damage to Businesses

The NOP fails to address the impact of the project on the businesses that exist along and upon Garden Highway which thrive only because individuals seek the tranquility and peace of a rural, river atmosphere that is easily accessible, peaceful and enjoyable. O4-16

7. Hydrology

The hydrology reports postulated by SAFCA and its engineers in previous Phases conclude the improved levee system contemplated by the NLIP will not increase the flood risk to the waterside property owners within the NLIP. These reports are explicitly based upon the assumption that other surrounding Reclamation Districts will NEVER improve their levees. This assumptiou is improper, flawed and not in concert with the current push by adjacent Districts to fortify their levees. The threat of increased flood risk cannot be summarily dismissed and a funding mechanism must be included to deal with the financial impact of this impact. O4-17

Equally troubling, SAFCA admits its "design event analysis is not the same as the analysis procedure used by USACE." As the primary advertised goal of the NLIP is to obtain USACE certification, why is SAFCA deviating from the USACE event analysis? The previous SAFCA EIRS/NEPA documents further note that the USACE analysis "includes consideration of system uncertainties." Does this mean the SAFCA analysis does not account for "system uncertainties" such as the other side of the levee overtopping or failing?

Waterside residents adjacent to the NLIP are very concerned about increased flooding of their homes due to the levee being raised as much as three feet. SAFCA has systematically advised the GHCA not to worry, as levees will overtop or fail elsewhere. Unfortunately, it appears SAFCA's engineering analysis does not account for this or assumes the other levees will be raised and reiuforced. If both sides of the levee are eventually raised, then the water capacity of the river will be increased. This would allow the upstream reservoirs to release more water during a flood event and subject residents to a much greater chance of flooding. The GHCA has beeu advised there is debate amongst USACE engineers as to which provides the better hydrological model, "perfect world" where you cannot take into account deficiencies in other parts of the levee, or "real world" where you can. What is USACE's view on this? O4-18

8. Property Values

The NOP, consistent with all prior SAFCA action related to the NLIP, wholly fails to address the impact of the Project on property values in the affected areas and has no funding mechanism in place to deal with the destruction of property values in and around the project that will ripen into eminent domain and inverse coudemnation lawsuits. This exposure includes, but is not limited to, irreparable damage to property values which began when this project was first publically announced (at a time when real estate values were significantly higher than today), and will continue indefinitely into the future. The Project has stalled and prevented sales, land improvements and retirement plans. This trend will increase exponentially when active construction begins. Due the lack of a fuuding mechanism, the taxpayers will be left to shoulder yet another wave of unanticipated and undisclosed cost overruns. O4-19

9. Failure to Consider Environmental Impact of Development

While SAFCA publicly justifies the massive NLIP as a necessary cure for the imminent, Hurricane Katrina type flooding that conld occur in the Natomas Basin iu the event of a 100-year-flood, in reality SAFCA is simply trying to lift the building moratorium affecting the builders who have imprudently chosen to pave over rice fields in a "basin". These are the same developers who have spent hundreds of thousands of dollars supporting our local officials and lobbying for the right to resume rapid development within the floodplain. Without more "urbau sprawl", these developers and the County of Sacramento are unable to tap into the "quick cash" that has beeu created from destroying our evaporating farm lands.

The GHCA contends that rather than encouraging additional urban sprawl, local agencies should be focusing on creating more housing in urban areas, i.e. building up, not out. Moreover, the failure of local agencies to curb their appetite for our farmlauds will only increase traffic congestiou, gas and carbon emissions and regional pollution at a time when universal fears and concerns over global warming, water scarcity and energy depletion is gaining momentum. O4-20

The GHCA contends the urban sprawl into the Natomas Basiu, quite ironically, increases the flood potential for Natomas and surrounding communities. Vast farmland that previously collected and stored water during heavy storms, before slowly releasiug it through natural underground seepage, has now been paved and improved with storm drains. Accordingly, thousands of acre feet of rainwater that previously rested safely within area farmland is now immediately collected and pumped into the Sacramento River. Historical flow charts from the Sacrameuto River during times of heavy storms confirm the negative impact Natomas Basin development is having on regioual flood protection.

10. Failure of the Notice of Preparation to abide by the Settlement Agreement between SAFCA and the GHCA.

The "Notice of Preparation" in no way mentions the previously agreed to settlement agreement between SAFCA and the GHCA. While the GHCA understands the USACE is not SAFCA, as the assignee of certain aspects of the Project, the USACE is legally required to comply with all legally enforceable agreements entered into by SAFCA, the assignor. To hold otherwise would render the settlement agreement between SAFCA and the GHCA illusory. O4-21

11. Rights of Entry/Eminent Domain.

It has recently come to the attention of the GHCA that SAFCA has pursued Right of Entry Agreements from Garden Highway property owners without advising those property owners of any authority for the desired access and without advising owners of their associated rights. By withholding this critical information, SAFCA has in essence coerced many Garden Highway residents into making uninformed decisions under the bold threat of imminent litigation should they resist. O4-22

In response to a recent complaint by the GHCA, counsel for SAFCA has confessed that entry onto the private property of Garden Highway residents is being sought pursuant to the Eminent Domain laws of the State of California. However, pursuant to California Code of Civil Procedure Section 1245.010, SAFCA and/or its contractors must be "**authorized to acquire property for a particular use**" **before**

they may enter private property in order to "take photographs, studies, surveys, examinations, tests, sonndings, borings, samplings, or appraisals or to engage in similar activities reasonably related to acquisition or use of the property for that nse." Apparently, SAFCA has repeatedly misinformed property owners that SAFCA possesses this authority when, in reality, no such authority had ever been obtained.

Based upon the foregoing, the GHCA hereby submits that all involved flood agencies seeking permission to enter private property must notify the affected property owners **of the legal authority upon which the agency relies, along with a full description of the associated rights afforded the property owners**.

O4-22 (Con't.)

Lastly, the GHCA hereby objects to the "taking" of private lands pursuant to the Eminent Domain laws under the guise that these lands are necessary for the development of the Project, when in fact the involved agency actually and surreptitiously plans to convey the condemned land to another private party, i.e. the airport.

12. Natomas Levee Recreational Trail Project.

The GHCA is pleased a recreational trail is finally being included as part of the NLIP. Unfortunately there is no funding mechanism in place other than waiting on the Department of Transportation, which has admitted could take years. As SAFCA and the USACE are already spending millions of dollars protecting cultural resources of Native American Indians, the GHCA believes it would be practical to allocate a nominal sum of money to enhance the resources of the current living residents in the Natomas Basin. The simple modification of the design of the new levee crown from a gravel road to paved road would bear a meager cost and would streamline the bike path for the DOT.

O4-23

13. Incorporation.

The GHCA also hereby incorporates by refereuce all comments asserted by Garden Highway property owners and/or their representatives in response to this portion of the NLIP.

In sum, while the GHCA appreciates the daunting task this Project presents to the involved flood agencies, its members strongly feel that a more rational design approach would substantially rednce these challenges, save the taxpayers hundreds of millions of dollars, preserve sensitive habitat and rich farmland and ultimately expedite recertification of the Natomas levees. Moreover, the GHCA implores the involved flood agencies to continue to acknowledge and adhere to the rights of all Garden Highway residents, businesses and property owners.

O4-24

Respectfully submitted,

GARDEN HIGHWAY COMMUNITY ASSOCIATION

Letter O4 Response	Garden Highway Community Association Gibson Howell, President August 17, 2010

O4-1 USACE and SAFCA will treat Garden Highway Community Association's (GHCA's) comment letter on the Phase 4b notice of preparation (NOP) as a comment letter on the DEIS/DEIR. See responses to comments O4-2 through O4-24.

USACE and SAFCA have prepared the NLIP environmental documents, including the DEIS/DEIR, in accordance with NEPA and CEQA, in particular the tiering provisions (see Section 1.5, "Environmental Regulatory Framework and Relationship of this EIS/EIR to Other Documents," of the DEIS/DEIR). USACE and SAFCA have strived to ensure that the NLIP environmental documents are understandable to decision makers and to the public, while still containing the level of detail necessary for a robust and technically adequate analysis aimed to withstand legal scrutiny. To help facilitate clarity, the NLIP environmental documents, including the DEIS/DEIR, include numerous plates, tables, and formatting considerations to highlight discussions pertaining to project alternatives, environmental impacts, and proposed mitigation measures.

The files on USACE's and SAFCA's Web sites are purposefully numerous to keep the files to manageable and easily downloadable sizes (less than 5 MB). It is not clear how the commenter proposes to hyperlink or cross-reference the files; however, the Table of Contents should serve as a guide the document as well as Chapter 10, "Index," of the DEIS/DEIR.

Regarding the late timing of the commenter receiving a paper copy of the DEIS/DEIR, a notice announcing the availability of the document was mailed to affected residents (including the commenter) on June 29–30, 2010 and printed in the *Sacramento Bee* on July 2, 2010. The notice indicated the electronic availability of the DEIS/DEIR on USACE's and SAFCA's Web sites, as well as where paper copies could be reviewed (at USACE's and SAFCA's office and at two local libraries). Additionally, CD or paper copies could have been requested from either USACE or SAFCA; several of these requests were received and materials were typically mailed within 48 hours of the request. The high cost of printing and the project's extensive mailing list have rendered paper copies of the NLIP documents mostly infeasible.

O4-2 Under NEPA and CEQA, the Federal and state lead agencies must consider a reasonable range of alternatives that would achieve most of the project objectives (project purpose, under NEPA) and reduce some of the environmental impacts of the project. The alternatives must also include a no-project (no action, under NEPA) alternative. Lead agencies are not required to consider every conceivable alternative, but are instead required to present a range of reasonable alternatives to foster informed decision-making (see CCR, Title 14, Section 15126.6 and 40 Code of Federal Regulations [CFR] 1502.14).

Section 2.1.5, "Alternatives Considered, but Eliminated from Further Consideration," of the DEIS/DEIS describes 11 alternatives that were considered but eliminated from further consideration in previously certified and approved NLIP environmental documents (and one additional alternative that was considered and eliminated by USACE as part of the Natomas PACR). This discussion illustrates the range of possible alternatives considered by USACE and SAFCA in relation to the NLIP as a whole. The DEIS/DEIR carries forward three alternatives to the Phase 4b Project for detailed analysis: the No-Action Alternative, the Adjacent Levee Alternative (Proposed Action), and the Fix-in-Place Alternative. The differences among these

alternatives are described in Table ES-1of the DEIS/DEIR, and the differences in associated environmental effects of the alternatives are described in Tables 2-28 and 2-29 of the DEIS/DEIR. Because the Phase 4b Project alternatives vary in the nature and severity of their potential environmental effects, USACE and SAFCA have presented a reasonable range of alternatives from which to select the Proposed Action.

The DEIS/DEIR attempts to describe the full range of potential adverse environmental effects, including and up to a worst-case scenario. As such, a range of 100–300 feet is provided for the likely width of the proposed seepage berms along the Sacramento River east levee Reach A:16–20 (see Table 2-2 of the DEIS/DEIR). As project design progresses, it is anticipated that the seepage berms may be more narrow in some locations depending, in part, on design considerations and property issues; however, the DEIS/DEIR takes a conservative approach in analyzing potential impacts and thus presents a worst-case scenario.

O4-3 Chapter 3, "Affected Environment," of the DEIS/DEIR provides detailed information related to the existing physical environment of the Phase 4b Project area. As discussed in Section 4.1.2.2, "Impact Mechanisms," of the DEIS/DEIR, the CEQA environmental analysis compares the action alternative and no-project alternative (No-Action Alternative) to the existing conditions at the time of release of the NOP (i.e., baseline for the purposes of CEQA), which was November 5, 2009 for the Phase 4b Project. NEPA considers the No-Action Alterative (i.e., expected future conditions without the project) to be the baseline to which the action alternatives are compared, and the No-Action Alterative is compared to existing conditions (including the Phase 2 Project). Each issue area discussed in Chapter 4, "Environmental Consequences and Mitigation Measures," of the DEIS/DEIR includes the section, "Methodology and Thresholds of Significance," where the impact mechanisms specific to the respective issue areas are discussed.

Section 4.5.1.1, "Methodology," of the DEIS/DEIR provides an overview of surface hydrology analysis, and states, specific to the NLIP analysis:

> The surface hydrology analysis evaluates the potential flood-related impacts of the action alternatives on water surface elevations in the stream and river channels in the project area and in the larger watershed within which the project is situated. Specifically, a UNET hydraulic computer model was used to compare existing conditions in the waterways surrounding the Natomas Basin and in the larger SRFCP both with and without the Adjacent Levee Alternative (Proposed Action) (with-project and without-project [i.e., No-Action Alternative], respectively) assuming no levee failure and other reasonably foreseeable improvements to Folsom Dam and the urban levees outside the Natomas Basin.

Following this discussion, Table 4.5-1 of the DEIS/DEIR summarizes the conditions and assumptions associated with each of the model runs. The modeling output generated by these conditions under the targeted flood scenarios is displayed in Tables 4.5-2 through 4.5-8 of the DEIS/DEIR. More detailed hydraulic modeling results are included in Appendix C of the DEIS/DEIR.

The use of a hydraulic computer model of the Sacramento River Flood Control Project (SRFCP) was reviewed and approved for use for this project in 2006 by the USACE Sacramento District to compare existing conditions in the waterways surrounding the Natomas Basin and in the larger SRFCP with and without the NLIP improvements and the other improvements comprising the 200-year flood protection program for the Sacramento area. See Appendix C of the DEIS/DEIR for more information regarding the hydrologic modeling approach.

O4-4 As discussed in Section 2.1.5, "Alternatives Considered, but Eliminated from Further Consideration," of the DEIS/DEIR, the Yolo Bypass Improvements alternative was eliminated from consideration because:

> (1) it would be too costly for SAFCA to implement; (2) levee height increases and substantial seepage and slope stability remediation would still be required for the Natomas perimeter levee system, adding to costs; (3) these improvements lie outside of SAFCA's jurisdiction and would require Federal, State, and local cooperation and funding; and (4) the project objectives of restoring 100-year (0.01 AEP) flood protection to the Natomas Basin could not be achieved as quickly as possible.

Implementation of the Phase 4b Project is contingent on issuance of numerous permits, authorizations, and approvals, including biological opinions from USFWS and NMFS; these agencies will consider applicable environmental legislation and biological opinions before issuance of permits. The project cannot proceed without the required permits.

O4-5 EPA's comment letter on the Phase 3 DEIS/DEIR and USACE's and SAFCA's responses in the Phase 3 FEIR are included as **Appendix J3** to this FEIS/FEIR. Comments on previous NLIP environmental documents, as well as any resulting project/document revisions made in response to those comments, were incorporated into subsequent NLIP environmental documents, including the Phase 4b DEIS/DEIR, as applicable. USACE and SAFCA have and will continue to work closely with EPA, USFWS, NMFS, DFG, and The Natomas Basin Conservancy (TNBC).

O4-6 DFG's comment letter on the Phase 3 DEIS/DEIR and USACE's and SAFCA's responses in the Phase 3 FEIR are included as **Appendix J4** to this FEIS/FEIR. Comments on previous NLIP environmental documents, as well as any resulting project/document revisions made in response to those comments, were incorporated into subsequent NLIP environmental documents, including the Phase 4b DEIS/DEIR, as applicable. See also response to comment O4-14.

O4-7 Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats" of the DEIS/DEIR addresses short-term (10–15 years) and long-term impacts due to loss of woodland habitat. SAFCA disagrees with the commenter's statement that it would take 50–100 years for new woodland habitat development. Based upon the expert professional judgment of SAFCA's biological consultants, habitat function would be expected to be restored within approximately 10–15 years, as described in Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats." Regardless of the length of time required to restore woodland habitat that would provide existing ecological function, the DEIS/DEIR concludes that short-term (10–15 years) impacts to woodland habitats would be a significant and unavoidable impact for 10–15 years before reaching a less-than-significant level because replacement plantings would require a minimum of 10–15 years before providing important habitat components such as shade and structure. SAFCA's previous projects involving woodland plantings and transplants within the project vicinity have been successful. Of 50 trees planted in the Rio Linda Creek Conservation Area, 94% have survived; similarly, of 14 oaks transplanted by SAFCA in 2004 as part of the Hagedorn Grove project, 12 survived (Buck, pers. comm., 2009).

At the time of submission of this comment letter on the Phase 4b Project (August 17, 2010), woodland plantings and transplants have not yet been completed; therefore, it is not yet possible to report on the success rate for these tree plantings and transplants for the Phase 3 and 4a Projects. However, pursuant to the woodland planting and maintenance contract, SAFCA's contractor for tree planting is required to attain performance standards (as approved by USACE, USFWS, and DFG through the Phase 2 Mitigation Monitoring Plan [MMP] approval process) during the initial maintenance period, which is the 3-year-period immediately following

acceptance of the installation portion of the woodland plantings by SAFCA. If the performance standards are not met, the project will not be accepted until the identified remedial actions are implemented by the contractor as directed by SAFCA. These remedial measures could include additional/replacement weed control or additional planting, using adaptive management to identify those plants best suited to the site. Performance standards included in the construction contract are listed below.

Performance Standards for Planting Survival During the Maintenance Period		
Year	Survival of Container Plants by Area (%)	Survival of Native Seed by Area (%)
1	95	50
2	95	50
3	90	50
Assessment Timing	Late Summer	Late Summer

Source: SAFCA 2009

SAFCA will conduct field assessments of the plant survivorship once per year, at the timing noted in the above table. Healthy plants are considered to be robust, in good form, free of disease and insect infestation, and exhibit vigorous growth (foliage and wood); they must not be heat- or water-stressed (SAFCA 2009).

In addition to the 3-year initial maintenance period, the MMP requires that SAFCA monitor and maintain woodland plantings for an additional 5 years (for a total of 8 years). Monitoring and maintenance plans discussed above are based upon the Phase 2 MMP, which was approved by USACE, USFWS, and DFG. SAFCA anticipates that these agencies would approve the same monitoring and maintenance schedules, which would be applied to the Phase 4b Project woodland planting component in the Phase 4b MMP.

The commenter does not provide specifics with regard to a lack of mitigation for removal of vegetation as part of implementation of earlier phases. Woodland plantings have occurred on parcels in Reach C:1, 2, and 4a to compensate for vegetation removal that has occurred as part of the Phase 2 and Phase 3 Projects. USACE will comply with its policy that mitigation must be constructed prior to or concurrent with project construction. The Phase 4b Project will comply with California Fish and Game Code Section 2081 requirements.

O4-8 The commenter's assertion that the NLIP will use TNBC lands for borrow material is incorrect. Table 2-22 in the DEIS/DEIR lists the proposed borrow sources for the Phase 4b Project. Additionally, Table 4.1-1 in the DEIS/DEIR lists the proposed borrow sites for the Phase 2, 3, and 4a Projects. These tables indicate that one of the primary sources of soil borrow would the Fisherman's Lake Borrow Area. TNBC owns some lands adjacent to the Fisherman's Lake Borrow Area, including managed marsh and agricultural upland (field crop). These TNBC-owned conservation lands would not be used for borrow operations. Lands that are currently used for agricultural purposes would provide borrow material, and would then be reclaimed as a mosaic of managed marsh and uplands. These sites would thus create connectivity between existing TNCB parcels adjacent to the Phase 4b Project borrow sites (see Plates 2-22d through 2-22f in the DEIS/DEIR, which shows the location of TNBC lands in relation to the proposed Phase 4b Project borrow sites). The Long-Term Management Plan (LTMP), which has been approved by the resources agencies and USACE, states that SAFCA intends to enter into management agreements with TNBC to manage the borrow/mitigation sites at Fisherman's Lake. These

agreements will not be executed until SAFCA has more specific plans and specifications for these sites.

O4-9 The DEIS/DEIR provides a list of significant and unavoidable impacts that would result from implementation of the Phase 4b Project (see Sections ES.11.2, "Significant and Unavoidable Impacts of the Action Alternatives," and 5.4, "Significant and Unavoidable Environmental Impacts," of the DEIS/DEIR) because no feasible mitigation is available to reduce the significant impacts to a less-than-significant level, or identified mitigation would minimize the impacts but would not reduce the significant impacts to a less-than-significant level. Impacts to biological resources are included on this list and are discussed in detail in Chapter 4, "Environmental Consequences and Mitigation Measures," of the DEIS/DEIR. USACE and SAFCA are obligated to secure permits from the applicable resource/regulatory agencies before project construction that could affect agency-regulated habitat. Issuance of these permits indicates that proposed mitigation and compensation are considered to be acceptable according to applicable Federal, state, and local regulations. Project construction cannot commence in areas where such permits are required. Agency documents are legally binding, enforceable terms and conditions of the various agencies including: USACE, USFWS, NMFS, DFG, TNBC, Sacramento County, the Sacramento County Airport System, the Natomas Central Mutual Water Company, and RD 1000. See also response to comment O4-6.

O4-10 As discussed on pages 4.11-2 and 4.11-3 (especially Table 4.11-1) of the DEIS/DEIR, to ensure that worst-case air quality impacts were captured for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative as required under NEPA and CEQA, emissions were estimated assuming that a portion of the Phase 4a Project (specifically, improvements to the Sacramento River east levee Reach A:13–15 and the Riverside Canal) is constructed in 2012, concurrent with the beginning of Phase 4b Project construction. It should be noted that emissions are estimated within the air districts that regulate them using mass emission thresholds for regional impact analysis. The Phase 4a Project components that would overlap with the Phase 4b Project (in the 2012 construction season) are located within Sacramento County. See also response to comment F3-2.

O4-11 As stated in the DEIS/DEIR, residents in or near the affected cutoff wall work area would be afforded the opportunity, at the project proponent(s)'s expense, to temporarily relocate to a nearby hotel for as long as construction extends 24 hours per day, 7 days per week (24/7) within 500 feet of their residence (see Mitigation Measure 4.12-a, "Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," of the DEIS/DEIR). Further, because 24/7 noise impacts are localized in nature, it is not clear how these impacts would be "compounded" by occurring in different locations at the same time or in different weeks, months, or years. Because 24/7 work would be conducted in discrete locations within the areas already identified for construction, and would only affect people locally for relatively short periods of time, there would not be any undisclosed compounding of effects that was not already analyzed in the DEIS/DEIR analysis of construction impacts. See also **Appendix J2** of this FEIS/FEIR, which includes the Phase 3 FEIR Master Response concerning 24/7 construction.

O4-12 See response to comment F3-1 regarding approval of the vegetation variance.

O4-13 See Section 2.3.4.11, "Structural Encroachments," of the DEIS/DEIR.

O4-14 See response to comment O4-6. Impact 4.7-f, "Impacts on Swainson's Hawk and Other Special Status Birds" in the DEIS/DEIR describes potential disturbance of special-status birds during project construction, which would occur during the daytime and nighttime. Mitigation Measure

Mitigation Measure 4.7-f, "Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Implement All Upland and Agricultural Habitat Improvements and Management Agreements to Compensate for Loss of Quantity and Quality of Foraging Habitat, Obtain Incidental Take Authorization; and Implement Mitigation Measure 4.7-a, 'Minimize Effects on Woodland Habitat, Implement all Woodland Habitat Improvements and Management Agreements, Compensate for Loss of Habitat, and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code'" in the DEIS/DEIR would be implemented during both daytime and nighttime activities to help reduce this impact; however, the impact would remain significant and unavoidable for 10–15 years due to the short-term (10–15 years) loss of woodland habitat.

O4-15 The DEIS/DEIR describes those project components that could require 24/7 construction, and states that 24/7 construction would only occur in rural areas, not in urban areas. The noise standards and ordinances of the City of Sacramento and Sacramento and Sutter Counties are described in Section 3.12, "Noise," of the DEIS/DEIR.

As discussed in Section 2.3.3.2, "Adjacent Levee Alternative (Proposed Action)," under subheading "Sacramento River East Levee (Reach A:16–20)," of the DEIS/DEIR, cutoff wall construction in the urbanized area east of the Interstate 80 (I-80) overcrossing (within the limits of the City of Sacramento), where most residences are located, would be restricted to daytime hours. Therefore, the City of Sacramento noise ordinance would not be violated in terms of construction equipment operating near homes during the more noise-sensitive early morning and nighttime hours (i.e., during hours that are not exempted by the applicable local ordinances in the City of Sacramento).

Work in Sacramento County could occur during nighttime hours. However, Section 6.68.090 of the Sacramento County Code exempts nighttime noise activities when unavoidable conditions occur during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed. This exemption allows work to continue after 8:00 p.m., including operation of machinery and equipment as necessary to bring the specific work in progress to completion under conditions that will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.

As discussed in Impact 4.12-a, "Generation of Temporary and Short-Term Construction Noise," of the DEIS/DEIR, construction at sites within Sutter County, including the Pleasant Grove Creek Canal (PGCC), State Route 99 Natomas Cross Canal (NCC) (bridge remediation), Vestal Drain ditch (relocation), Brookfield borrow site (conversion to managed marsh), and Chappell Drain and Ditch, would not affect sensitive receptors, regardless of whether it occurs during nighttime hours, because no noise-sensitive land uses are within 1,000 feet of construction activities and/or because topographic features (such as a levee) would shield sensitive receptors from noise sources. Therefore, the Sutter County noise ordinance would not be violated.

See also response to comments O4-11, O4-14, and **Appendix J2** of this FEIS/FEIR, which includes the Phase 3 FEIR Master Response concerning 24/7 construction.

O4-16 Mitigation Measure 4.3-d, "Notify Residents and Businesses of Project Construction and Road Closure Schedules; and Implement Mitigation Measures 4.10-a, 'Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips,' and 4.10-c, 'Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers'" in the DEIS/DEIR requires the project proponent(s) to provide business

owners with information pertaining to construction activities, complaint procedures, and construction timelines.

It should further be noted that effects analyzed under CEQA must be related to a physical change in the environment (State CEQA Guidelines CCR Section 15358[b]). Economic and social effects are not considered environmental effects under CEQA. These effects need to be considered in an EIR only if they would lead to a significant adverse effect on the physical environment.

NEPA does require consideration of economic effects (40 CFR 1508.8); however, this requirement is limited to effects that are reasonably foreseeable rather than speculative in nature (Mandelker 2007: 8-102, citing *City of Riverview v. Surface Transp. Bd.*, 398 F 3d 434 [6th Cir. 2005]). Here the commenter states that the project would have an effect on business along Garden Highway, but does not offer specific facts linking the project to a demonstrable effect on these businesses that can be clearly attributed to the project. Absent specific facts showing a clear effect on these businesses, this comment contains speculation that is beyond the required and practicable scope of analysis under NEPA.

O4-17 SAFCA's conclusion that the NLIP would not increase the flood risk to waterside property owners along Garden Highway is based on surveys that indicate that the Sacramento River east levee is currently higher than most of the Sacramento River west levee in the reach downstream of the NCC. Therefore, increasing this height differential would not alter the current balance of risks in this reach of the system. The increased height of the east levee would contribute cumulatively to an increase in flood risk to waterside property owners only if the west levee were raised to a height equal to or greater than the current height of the east levee. The protected basin on the west side of the Sacramento River is agricultural in nature; it contains very few damageable structures. As discussed in Section 3.2.2, "Environmental Setting," of the DEIS/DEIR, SAFCA recently entered into an arrangement with Yolo County, the California Department of Water Resources (DWR), the Yolo Land Trust, and the Sacramento Valley Conservancy that resulted in the recordation of agricultural conservation easements on 1,660 acres of land in this basin. Under these circumstances and in light of recently enacted revisions to the State's Planning and Subdivision laws restricting development in floodplain areas, it is highly unlikely that the Sacramento River west levee will ever be raised to a height exceeding the current height of the Sacramento River east levee.

Further, the commenter states that "these reports are explicitly based upon the assumption that other surrounding Reclamation Districts will never improve their levee." This statement is not correct. USACE and the CVFPB have set policies that grant all levee districts the opportunity to strengthen their levees. If a levee district chooses to raise a levee, then that district must demonstrate that it will not have an adverse impact. The Phase 4b Project's hydraulic impact analysis took this into consideration by assuming that other levees in the system would overtop, but not fail. If other levee districts choose to raise their levees then those districts will need to conduct a hydraulic impact analysis to demonstrate that there are not adverse impacts.

O4-18 Contrary to what the commenter states, SAFCA is not seeking certification of the levee system by USACE. SAFCA's methodology for developing a design water surface does differ from USACE's methodology; however, the method for determining hydraulic impacts is the same. The hydraulic impact analysis contained in the DEIS/DEIR evaluates hydraulics impacts based on upstream levees failing when overtopped along with the condition of allowing upstream levees to overtop without failing. Both of these conditions resulted in a conclusion that the impact was less than significant (see Section 4.5, "Hydrology and Hydraulics," in the DEIS/DEIR). Also, see response to comment O4-17.

O4-19 See response to comment O4-16 regarding NEPA and CEQA requirements to analyze economic effects.

O4-20 See response to comment F3-5.

O4-21 USACE is not legally required to comply with the Garden Highway Settlement Agreement, contrary to what the commenter states. However, USACE has agreed to implement many of its provisions, as indicated in the mitigation measures contained throughout the DEIS/DEIR.

It should be noted (and it was noted in response to GHCA's comment O1-23 on the Phase 4a FEIR and FEIS) that SAFCA is also not legally required to comply with the Garden Highway Settlement Agreement, which concerns only the Phase 2 Project, but which is being voluntarily implemented by SAFCA for the other NLIP project phases.

O4-22 This is not a comment on the DEIS/DEIR. SAFCA has been given legal authority by the Legislature "to coordinate a regional effort to finance, provide, and maintain facilities and works necessary to ensure a reasonable and prudent level of flood protection, as determined by the agency…" (California Water Code App., Section 130-20[c]), which includes entering into right of entry agreements. To the extent that property must be acquired to implement the Phase 4b Project, USACE and SAFCA would comply with all applicable legal requirements.

O4-23 As stated in Section 2.3.4.7, "Natomas Levee Class 1 Bike Trail Project," of the DEIS/DEIR, additional design and engineering work is required to determine the exact alignment of the bike trail in terms of its placement in relation to levees and roadways. Therefore, this element of the Phase 4b Project is analyzed at a program level of analysis in the DEIS/DEIR. Construction, operation, and maintenance of a recreation trail on the perimeter levee system would be funded locally, separate from the levee improvement elements of the Phase 4b Project. Site-specific environmental review will be conducted once detailed design is available.

O4-24 Comment noted. See responses to previous comments regarding environmental issues.

BUSINESSES

B1

Henningsen, Sarah

From: Greg Johnson [gjohnson@kvie.org]
Sent: Wednesday, July 14, 2010 2:33 PM
To: Holland, Elizabeth G SPK
Cc: Parker, Laurie S SPK; Henningsen, Sarah; Tibbitts, Dan P SPK; McDaniel, David P SPK
Subject: RE: NLIP Garden Highway Reach 16

Elizabeth;

Thanks, that gives me a better understanding of the purpose of the EIS/EIR which in part is to present the worst case scenarios.

Laurie has provided some detail depicting what is more likely to be actually constructed. From that information it appears the impact to our property is much more conservative and at this point does not seem to impact the tower or building.

Greg Johnson
Director of Engineering

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-----Original Message-----
From: Holland, Elizabeth G SPK [mailto:Elizabeth.G.Holland@usace.army.mil]
Sent: Wednesday, July 14, 2010 2:22 PM
To: Greg Johnson
Cc: Parker, Laurie S SPK; Henningsen, Sarah; Tibbitts, Dan P SPK; McDaniel, David P SPK
Subject: RE: NLIP Garden Highway Reach 16

Greg,

I understand you spoke with Laurie Parker from our real estate division. What you have reviewed is a draft EIS/EIR for the Natomas Study, we do not have authorization from Congress at this time for a project and so therefore, you have not been contacted about the location of the KVIE tower. If we receive congressional authorization for a project we will work to prepare design refinements. That is when we would coordinate with you on the tower. We will take your e-mail as a comment on the draft EIS/EIR and make sure that

1

it is considered in the final document. We will also work with you to look at alternatives in this area when we start to prepare plans and specifications. We will try and design to provide public safety and prevent impacts to the KVIE tower. At this time we are just not to a point that we can provide you with details of what will occur in that area - our EIS/EIR looks at the greatest potential impacts as required under NEPA.

If you have further questions please give me a call and if I cannot help you and will find someone who can.

Elizabeth Holland
U.S. Army Corps of Engineers
Senior Environmental Manager
(916) 557-6763 Cell (916) 524-8239
e-Mail Elizabeth.g.holland@usace.army.mil

-----Original Message-----
From: Greg Johnson [mailto:gjohnson@kvie.org]
Sent: Wednesday, July 14, 2010 10:15 AM
To: Holland, Elizabeth G SPK
Subject: NLIP Garden Highway Reach 16

John and Elizabeth;

KVIE owns property affected by the proposed levee improvements described in the just released DEIS/DEIR for the Natomas Levee Improvement Program. Our property is located on Garden Highway in the area described as Reach 16 in the document.

Located on our property, which is adjacent to the present levee, is a communications tower and associated building and equipment that is used to relay our broadcast programming from our studio to our transmitter site located in Walnut Grove, as well as an interconnection with our sister PBS station KQED in San Francisco.

B1-1

In reading through the DEIS/DEIR it is clear that as part of this project major changes would take place on our property. Plate 2-8A (attached) shows that along with the widening of the levee itself, the finished grade of the 300 foot seepage berm would be substantially higher than the existing grade and extend through the present location of our tower and building. This is quite alarming especially as we were not informed earlier of the possibility that we would have to move or modify this vital tower, building and equipment.

I need one of you to call me to further explain exactly what's planned and its impact on our facility and property on Garden Highway.

2

Greg Johnson

Director of Engineering

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Letter	KVIE
B1	Greg Johnson, Director of Engineering
Response	July 14, 2010

B1-1 The DEIS/DIER analyzes the worst-case scenario (i.e., the greatest potential impacts that could occur), which may include conflicts with existing KVIE facilities. If Congress authorizes the Phase 4b Project, USACE and SAFCA will begin detailed plans and specifications of project features. If possible, KVIE structures, including the communications tower, would be avoided. In the case that avoidance is not possible, USACE and SAFCA will coordinate with KVIE to ensure that impacts are minimized to the greatest degree possible.

INDIVIDUALS

I1

3934 El Centro Road
Sacramento, Ca 95834

July 7, 2010

John Bassett, Director of Engineering
SAFCA
1007 7th Street, 7th Floor
Sacramento, Ca 95814

Re: Comments on DEIS / DEIR and Natomas PACR

Dear Mr. Bassett:

This is to comment on deficiencies we perceive in the above materials. Although we support simultaneous efforts to improve flood protection and conservation in our neighborhood, we also believe it is critical to delineate all impacts of the proposed project, and to identify all viable mitigation efforts. I1-1

This comment letter is to point out two inter-related project aspects – to highlight possible ground water hydrology impacts due to aggregated factors, and to note the lack of specificity and comprehensive analysis of improvements to the West Drainage Canal. At the end of this comment letter we will link these two issues.

Regarding ground water hydrology impacts, we note that some elements are not analyzed, and others are analyzed in isolation, without consideration of their combined and possible multiplier impacts – for instance, due to changes in vegetation. For example, page 4.5-16, "Effects of Cutoff Walls on Existing Groundwater Wells," notes restrictions on movement of ground water. Elsewhere in the document, numerous mentions of additional wells are noted (for example, page 2-61 notes that irrigation wells may be needed to be established for woodland groves; page 4.7-2 discusses creating managed marsh for giant garter snake, again creating a demand on ground water hydrology.) Most significantly, missing from the discussion is the impact on near- I1-2

SAFCA '10 JUL 13 AM11:14

surface groundwater moisture from the creation of significant earth "borrow" depressions. Although hillside hydrology is complicated, it is our general understanding that such terracing has an impact: that "upper terraces" dry out more than "lower terraces." Because our approximately 3 acre ranchette – as well as our neighbors – are on the "upper terrace" near significant proposed "borrow areas" and are planted in home orchards, and depend on well water for our domestic use as well as irrigation, we have concerns about the cumulative impact of the various ground water hydrology elements, mentioned above, notably potential additional pumping required to maintain our private property or well failure.. We believe the draft needs to delineate these elements better, and to use a systems approach to look at these elements in combination.

I1-2 (Con't.)

Regarding the lack of specificity and comprehensive analysis of improvements to the West Drainage Canal, we note several deficiencies. The part of that waterway east of El Centro Road, between Arena Blvd and Peregrine Park / I-5 seemingly is never mentioned. That omission is particularly troubling because that section of the waterway has the same habitat limitations mentioned elsewhere (for example, page 2-60 notes "...mostly barren, steep banks with little or no cover or foraging habitat...") Additionally, the report fails to note, for that same section of the waterway, the existence of several significant open public lands with potential for design integration for West Drainage Canal habitat improvements. Those existing public lands include 1) Witter Ranch State Historical Park / San Juan Reservoir park, 2) Red Tail Hawk Park, and 3) Peregine Park. The reports also fails to mention the recreational use of the entire West Drainage Canal, the levies of which are used for biking and strolling by many residents. Additionally, the report fails to note the impending completion of a crucial link in Sacramento bikeways, tying into the West Drainage Canal and Peregrine Park (see Sacramento Bee, June 6, 2010, "Groundbreaking held for Natomas bike bridge link" – ironically, that article mentions that construction will stop for several months to accommodate the hibernation season of the giant garter snake, one of the objectives of the NLIP). Design attention to this section of the West Drainage Canal is also important because the CH2MHill analysis of giant garter snake records, as part of their Revised Natomas Basin HCP (their Figure 12), charts existence of the species in this area.

I1-3

I1-4

I1-5

As mentioned previously, we believe these two concerns are actually linked. We believe that an element in mitigating the ground water hydrology issues above are contained in improvements potentials to the West Drainage Canal. The very elements that improve habitat (see page 2-60 – "..sloped banks supporting native sedges and rushes at the shoreline..." and "...a variable width submerged bench located within the bank, which would support a band of tules...") would also improve ground water percolation recharge. The existence of public open spaces which could accommodate slight widening of the canal in spots to achieve this goal seems to be an opportunity that the NLIP should not overlook. For the very few significant, privately owned open space parcels contiguous with the West Drainage Canal (such as the parcel on Arena Blvd. that backs up to the canal), perhaps strategic land use design stipulations could accommodate such habitat improvements before they are precluded by development. I1-6 I1-7

We hope that these comments further improve the draft.

Sincerely,

Jorge Jimenez, Ph. D.
Ron Selge

Letter	
I1	Jorge Jimenez, Ph.D and Ron Selge
Response	July 7, 2010

I1-1 See responses to comments I1-2 through I1-7.

I1-2 **Effects on groundwater from cutoff wall installation.** These potential impacts were addressed under Impact 4.5-c, "Effects on Groundwater," of the DEIS/DEIR and in a report prepared by Luhdorff & Scalmanini, Consulting Engineers (LSCE) (LSCE, May 4, 2009) entitled *Evaluation of Potential Groundwater Impacts Due to Proposed Construction for the Natomas Levee Improvement Project* included in Appendix C2 of the DEIS/DEIR. That report was updated in a technical memorandum entitled *Potential impacts of Slurry Cutoff Walls Proposed for Phase 4B of the Natomas Levee Improvement Program* (LSCE, January 28, 2010) included in Appendix C4 of the DEIS/DEIR. Both reports concluded that groundwater flow reductions due to proposed cutoff walls would be small and not have significant impacts on groundwater conditions anywhere in the Natomas Basin, including on the productive capacity of private wells.

Effects on groundwater from groundwater supply wells developed for created habitat. The Phase 4a EIS/EIR (Impact 4.5-c) addressed the potential impacts on groundwater from installation of groundwater wells to support both managed marsh in the Fisherman's Lake area as well as woodland corridors. The Phase 4b Project does not propose additional groundwater wells beyond those wells that were analyzed in the Phase 4a EIS/EIR. Details can be found in the technical memorandum, *Potential Impacts of Proposed Phase 4a Habitat Mitigation Wells* (LSCE, August 5, 2009), included in Appendix C5 of the Phase 4a EIS/EIR. That analysis was updated for the Fisherman's Lake area in a second technical memorandum, *Potential Impacts of Proposed Fisherman's Lake Marsh Wells* (LSCE, October 30, 2009), included in Appendix C6 of the Phase 4a EIS/EIR. Both reports concluded that the proposed habitat mitigation wells would not have significant impacts on nearby private wells in the Fisherman's Lake area.

Effects of borrow site excavation on groundwater levels beneath adjacent properties. For borrow sites that would not be converted to managed marsh, removal of borrow material would not affect groundwater levels because the final grade of the reclaimed borrow areas would still be above the water table. In the case of borrow sites that would be converted to managed marsh, removal of borrow material below the water table would also not result in lower groundwater levels because water levels would be managed by importing sufficient water to replace water lost to evapotranspiration from marsh vegetation and open water areas. Surface water levels in the managed marsh proposed for the Fisherman's Lake area would be maintained at elevations of 13–14 feet, which are several feet higher than the average underlying groundwater levels. As a result, infiltration from water in the managed marshes would actually result in a slight increase in underlying groundwater levels.

I1-3 Improvements to the West Drainage Canal east of Fishermans' Lake, including the urbanized section east of El Centro Road, are not part of the NLIP and were therefore not analyzed as part of the Phase 4b Project.

I1-4 Because no improvements would be constructed along the West Drainage Canal east of Fisherman's Lake, recreational uses along this section of the canal would not be affected and were not analyzed as part of the Phase 4b Project.

Temporary changes in recreational opportunities during project construction activities are addressed in Impact 4.13-c, "Temporary Changes in Recreational Opportunities during Project Construction Activities" of the DEIS/DEIR. The West Drainage Canal, which is shown on Plate 2-17 of the DEIS/DEIR, is owned and operated by RD 1000 and is not a designated public recreational facility (see Plate 3-7 of the DEIS/DEIR). Any incidental use of this canal for recreation (e.g., walking or bicycling) would only be affected during construction, and public recreational facilities in the vicinity of the West Drainage Canal, such as Fisherman's Lake Parkway and Open Space, would be available as substitutes.

I1-5 West Drainage Canal improvements designed to improve habitat for giant garter snake are described in Section 2.3.4.1, "West Drainage Canal Habitat Improvements," of the DEIS/DEIR. 4.7-e, "Giant Garter Snake Mortality, Injury, and/or Disturbance to Habitat" of the DEIS/DEIR addresses impacts to giant garter snake.

I1-6 Because Impact 4.5-c, "Effects on Groundwater," of the DEIS/DEIR concludes that no significant groundwater impacts would occur with implementation of the Phase 4b Project, no mitigation is necessary.

I1-7 See response to comment I1-3.

Jew, Deborah

I2

From: Holland, Elizabeth G SPK [Elizabeth.G.Holland@usace.army.mil]
Sent: Tuesday, August 17, 2010 8:22 AM
To: Henningsen, Sarah; Dunn, Francine
Cc: Ruhl, Jane C LRL; Muha, Andrew T SPK; Evoy-Mount, Matilda L SPK; Bassett, John (MSA)
Subject: FW: Natomas Levee project 4b

An additional comment from Mr. Perry.

Elizabeth Holland
U.S. Army Corps of Engineers
Senior Environmental Manager
(916) 557-6763 Cell (916) 524-8239
e-Mail Elizabeth.g.holland@usace.army.mil

-----Original Message-----
From: john P [mailto:john@pbbcpas.com]
Sent: Thursday, August 12, 2010 2:01 PM
To: Holland, Elizabeth G SPK
Cc: Parker, Laurie S SPK
Subject: Re: Natomas Levee project 4b

Dear: Ms. Holland: Thank you for your response. The inclusion of habitat mitigation adjacent to our agricultural property causes great concern because of past problems we have had farming adjacent non agricultural parcels. The affects of damages from insects, rodents and birds is unimaginable. In the case of certain corps, we have suffered total loss farming next to non farmed parcels. I2-1

Thank you;
John Perry

On 8/12/2010 12:36 PM, Holland, Elizabeth G SPK wrote:
> Mr. Perry,
>
> We will include these as official comments on the draft EIS/EIR and
> respond to them in the final document. The Corps has not begun plans
> and specifications for this reach of the project at this time.
> Construction of the reach you refer to is slated for 2013, depending
> on Congressional Funding. When we begin construction drawings we will
> be contacting concerned individuals to coordinate efforts of design
> and construction. In the mean time you will find responses to your
> comments in the final EIS/EIR which will be released in the October
timeframe.
>
> Elizabeth Holland
> U.S. Army Corps of Engineers
> Senior Environmental Manager
> (916) 557-6763 Cell (916) 524-8239
> e-Mail Elizabeth.g.holland@usace.army.mil

1

>
>
> -----Original Message-----
> From: john P [mailto:john@pbbcpas.com]
> Sent: Wednesday, July 28, 2010 2:51 PM
> To: Holland, Elizabeth G SPK
> Cc: BassettJ@saccounty.net
> Subject: Natomas Levee project 4b
>
> Dear Ms. Holland: At the recent work shop, I indicated that I would
> send you a list of questions related the project. Attached is a list
> of questions related to the project. I would like to meet with your
> staff or consultants to address some of our concerns. In several
> weeks our operation will be at peak activity and it would be
> appropriate for your staff or consultants to visit our operation, so
> they have an understanding of the affects of the project on our operations.
>
> Contact me at your convenience.
>
> Thank you;
> John Perry
>
>
>

2

PERRY FARMS
DIVERSIFIED FARMING
350 Court Street, Woodland, CA 95695
Telephone (530) 662-3251
Fax (530) 662-4600

MEMO LETTER

Date: July 23, 2010

To: USACE; Attention Elizabeth Holland

From: John Perry, Perry Farms

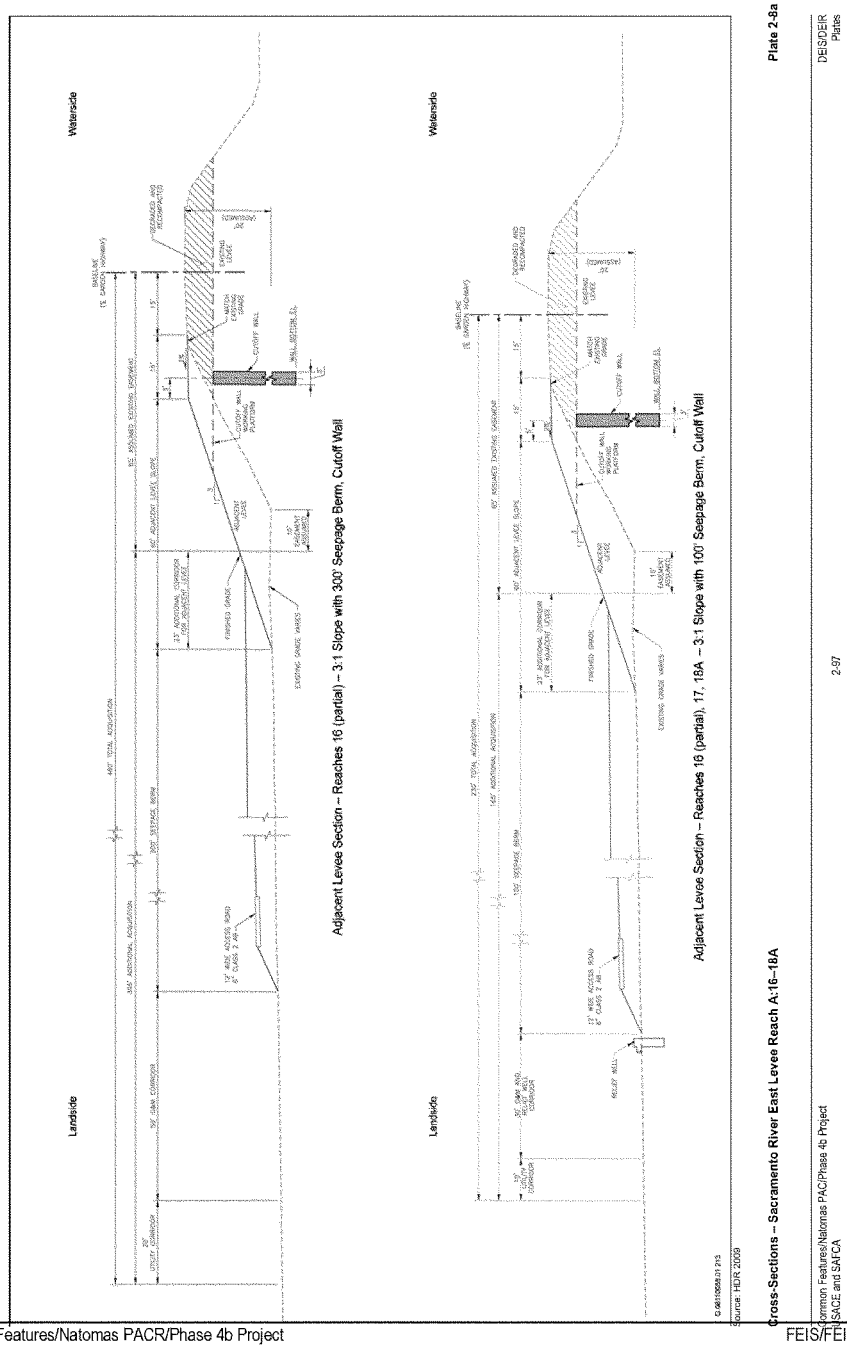
Re: Natomas Phase 4B project

Per out review of the DEIS/DEIR we have questions as to the physical and financial impact of the project on our farming operation. We will start with a description and physical location of our operation, in order for the CORP of Engineers has an understanding of the affects of this project on our operation.

The operation is located south of the Fisherman's Lake and farms approximately 1,000 acres. The operation has been in existence since the 1930s. The operation farms a variety of crops including wheat, corn, safflower, sunflower and fresh market vegetables. A substantial amount of the acreage farmed is located along the Garden Highway. A majority of the fresh market vegetables are grown on property along the Garden Highway. A large portion of irrigation water is serviced from the Riverside Canal. I2-2

In order to plan the future of the operation, we need some clarity as to the timing and foot print of the project. The following is a list of questions that we have in order to plan how to deal with the project:

1. What is the foot print of the project? I2-3
2. What are the dates anticipated for the initial physical occupation of the project foot print and the anticipated duration? I2-4
3. What are the dates and duration of the relocation of the Riverside Canal I2-5
4. What is the physical design and location of the River Canal? I2-6
5. How will irrigation water be serviced to the area while relocation and construction work occurs? I2-7
6. What are the location of the borrow sites? I2-8
7. Between the project's foot print and the barrow sites, there will be a substantial reduction in acreage being farmed by our operation; what provisions are being made to address the economic impact on our farming operation. I2-9
8. Substantial compaction of soils will occur as result of the construction activities and relocation of canals. What factors are being considered to address this long term affect on agricultural activities? I2-10
9. The relocation of the canals and levee construction will change the landscape of the area. What provisions are being made to eliminate the creation of habitat for rodents, noxious weeds and insects? I2-11
10. Farming requires the movement of farm equipment, between various parcels. Are provisions being made to address ingress and egress while construction is occurring? I2-12



Cross-Sections – Sacramento River East Levee Reach A:16–18A

Source: HDR 2009

Plate 2-8a

Letter I2 Response John Perry, Perry Farms Diversified Farming
July 28, 2010 and August 12, 2010

I2-1 Because the commenter is not specific about the location of his agricultural property, it cannot be confirmed whether habitat would be located adjacent to it. However, comment I2-2 indicates that the property is located south of Fisherman's Lake. The construction of habitat in the Fisherman's Lake area, as part of reclamation of soil borrow sites, was addressed in the Phase 4a EIS/EIR (see Plate 2-12 of the Phase 4a EIS/EIR for the conceptual plan). All habitat established as part of this complex would be located north of Radio Road. Following excavation of borrow material, borrow sites within the Fisherman's Lake area would either be developed as managed marsh or returned to agricultural use, such as growing hay or alfalfa. Except for the marsh, which would be managed as habitat for giant garter snake, no parcels in the Fisherman's Lake area would be unfarmed.

I2-2 Comment noted.

I2-3 The Phase 4b Project components are shown in the following plates in the DEIS/DEIR:

- Plates 2-7a and 2-7b (Sacramento River east levee Reach A:16–20),
- Plate 2-9 (American River north levee Reach I:1–4),
- Plate 2-11 (NEMDC North),
- Plate 2-13 (PGCC),
- Plate 2-14 (NEMDC South),
- Plate 2-16 (NCC),
- Plate 2-17 (West Drainage Canal and West Lakeside School Site), and
- Plate 2-19 (Potential Woodland Planting Area in Lower Dry Creek).

While the above plates show the proposed locations of the Phase 4b Project components, the exact project footprint has not been finalized. The DEIS/DEIR discloses the worse-case effects (i.e., greatest potential impacts) of the Phase 4b Project, and thus evaluates a larger project footprint than would actually occur. USACE is in the process of awarding a contract to begin detail designs of the Phase 4b Project, and detailed designs and footprints should be available in 2011. USACE will work with landowners over the next year to configure the Phase 4b Project with the least potential impacts to the public. If impacts are determined to be significant beyond what has been disclosed in the EIS/EIR, a supplemental NEPA/CEQA document will be prepared.

I2-4 The Phase 4b Project is anticipated to begin construction in 2012 and be completed in 2016. All work by USACE will be based on Congressional authorization and funding.

I2-5 See response to comment I2-4 for overall construction schedule. Relocation of the Riverside Canal is planned to occur in 2012 (as shown in Table 4.11-1 of the DEIS/DEIR).

I2-6 A conceptual alignment of the relocated Riverside Canal is shown in Plate 2-7a of the DEIS/DEIR. Detailed design of the Riverside Canal has not been finalized. USACE will work with landowners over the next year to configure the Phase 4b Project with the least potential impacts to the public. If impacts are determined to be significant beyond what has been disclosed in the EIS/EIR, a supplemental NEPA/CEQA document will be prepared.

I2-7 Mitigation Measure 4.15-a, "Coordinate with Irrigation Water Supply Users Before and During all Irrigation Infrastructure Modifications and Implement Measures to Minimize Interruptions for Supply," of the DEIS/DEIR requires the project proponent(s) to coordinate with water supply providers and consumers to minimize interruptions, conduct work during the nonirrigation season whenever feasible, and ensure that essential water supply necessary during the irrigation season is provided by an alternative supply if an interruption is unavoidable.

I2-8 The borrow sites identified in the DEIS/DEIR are all potential borrow sites for the Phase 4b Project (see Section 2.3.3.4, "Borrow Sites," Tables 2-22 and 2-23, and Plate 2-6 in the DEIS/DEIR). However, USACE is still in the process of determining the exact amount of borrow material that would be required. If additional borrow sites are needed, supplement NEPA and/or CEQA documentation will be prepared.

I2-9 See response to comment I2-8. See also response to comment O4-16 regarding NEPA and CEQA requirements to analyze economic effects.

I2-10 The soil compacted by construction activities can be scarified such that the compaction densities match pre-construction densities.

I2-11 RD 1000 and SAFCA will be responsible for maintaining the new canals and levees after completion of the project. Common practice includes filling in rodent holes, mowing and spraying weeds, and providing vector control.

I2-12 Access routes for farming will be maintained during project construction, as they will be maintained for all landowners in this reach.

13

July 28, 2010

Elizabeth Holland, Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

RE: Natomas Levee Improvement Program
Construction Staging Area for Lease

Dear Ms. Holland,

My name is Imogene W. Amrine and I own a 10 acre parcel at 2520 Garden Highway (APN: 274-0250-040-0000). Physically my parcel is located 1 mile south of San Juan Road on Garden Highway.

This 10 acre parcel was leased from me in the past and used as a construction staging area during levee improvements. It has electricity, well water and a driveway (over the irrigation ditch) that was constructed for heavy loads. I3-1

The parcel is available for lease immediately and throughout the Natomas Levee Improvement Program. Please let me know who I should talk to with regards to the possibility of leasing out my parcel.

Enclosed is a parcel map with my parcel highlighted and an aerial photo of the parcel.

Sincerely,

Imogene W. Amrine

Imogene W. Amrine
5640 Angelina Ave.
Carmichael, CA 95608
916/487-2422

Cc: John Basset, Director of Engineering, SAFCA

Enc.

SAFCA '10 JUL 30 AM11:46

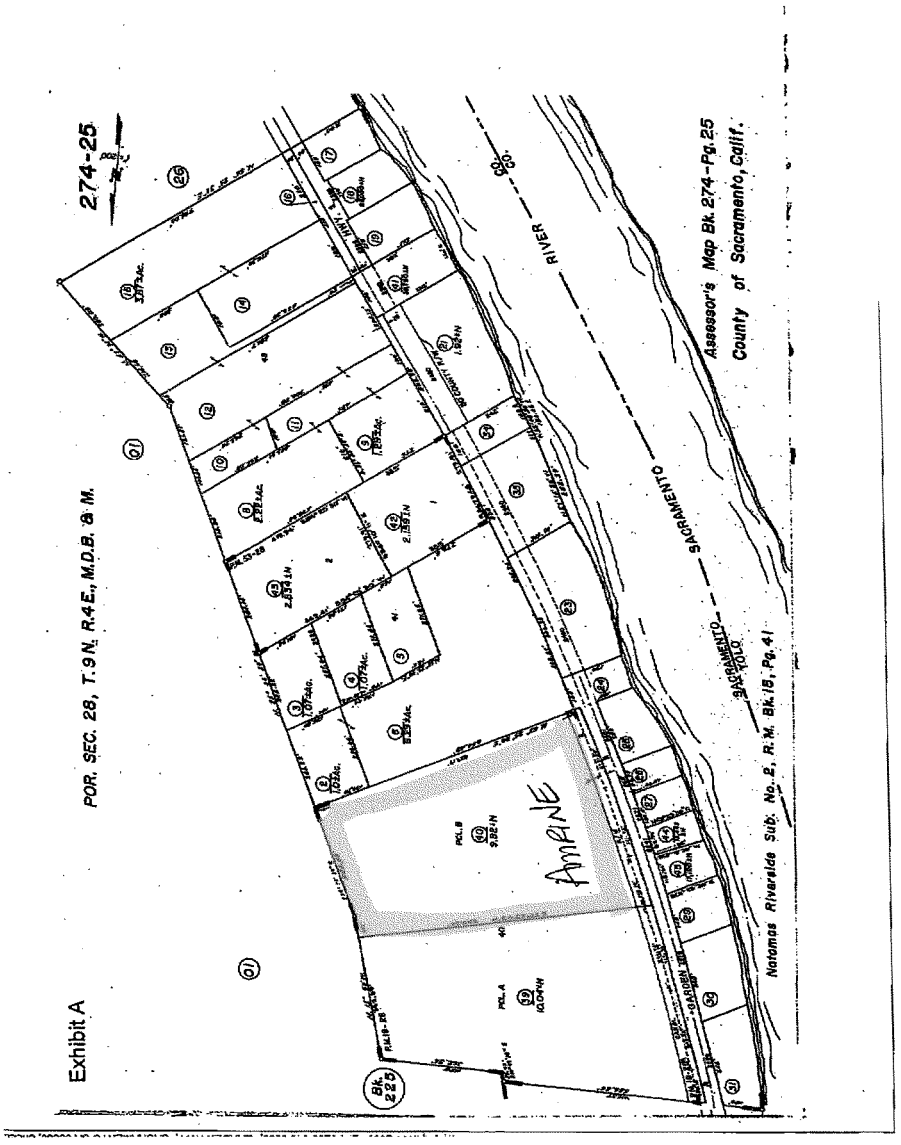


Exhibit A
274-25
POR. SEC. 28, T. 9 N., R. 4 E., M.D.B. & M.
Assessor's Map Bk. 274-Pg. 25
County of Sacramento, Calif.
Natomas Riverside Sub. No. 2, R.M. Bk. 18, Pg. 41
SACRAMENTO
RIVER
SACRAMENTO
YOLO
AMPINE
Bk. 225

Letter	
I3	Imogene W. Amrine
Response	July 28, 2010

I3-1 The availability of APN 274-0250-040 for lease as a construction staging area will be considered by project engineers during preparation of detailed design and specifications of the Phase 4b Project.

14

Phillip Day Perry
2346 La Lima Way
Sacramento, California 95833

August 4, 2010

Elizabeth Holland, Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

RE: Comments related to the Phase 4b Project of the NLIP

Dear Ms. Holland,

Thank you for the opportunity to offer comments regarding the DEIS/DEIR for the above-referenced project.

My residence of the last 21 years abuts the RD1000 Main Drainage Canal and is located within one block of the project area described as Reach 19b. 14-1

During my tenure in Natomas, I have been subject to slurry wall construction, pumping plant improvements, and additional cutoff-wall construction that have created noise, dust, and traffic nightmares. 14-2

As currently presented, this project will unduly and negatively impact the quality of life for every resident who lives within a mile of this project's footprint, both during construction and for years after.

Schematics of the levee "improvements" indicate that in this heavily populated area, we will soon face slopes denuded of mature trees, new retaining walls, months-long road closures, and seemingly endless noise and dust. 14-3

This project also reeks of wasted tax dollars.

Dollars wasted on earlier levee work now deemed inadequate. Dollars wasted tearing-up recently completed cutoff-wall work at pumping plant #1 so outfall pipes can be reconfigured. Dollars wasted on over-building an already adequate levee system. 14-4

This project will simply destroy the existing visual character of the project area. 14-5

I am a minority voice to be sure as we can assume that ninety-nine percent of the population of Natomas cares only about not having to pay for flood insurance. What those of us who live in the actual construction area have to go through while this project is undertaken makes no difference. The fact is, those in charge will look at these and any other comments provided, shrug their shoulders, then do what *they* believe to be in the best interests of the community, contrary viewpoints be damned. 14-6

I just don't have that much faith that SAFCA, the USACE, or any other government agency involved in this project truly knows what they are doing except a desire to turn the Sacramento River into a drainage ditch, ala the Los Angeles River. There must be better ways to achieve the results being dictated to us by USACE. 14-7

Sincerely,

Phil Perry

Letter I4 Response	Phillip Day Perry August 4, 2010

I4-1 Comment noted. The commenter lives within the Phase 4b Project area.

I4-2 Comment noted. Construction projects may result in noise, air quality, and traffic impacts.

I4-3 The intent of EISs and EIRs is to provide information related to a proposed project, disclose potentially significant impacts and to propose mitigation measures to reduce potentially significant impacts. The DEIS/DEIR outlines the anticipated temporary and long-term impacts associated with the Phase 4b Project (for reference see Table ES-2, "Summary of Impacts and Mitigation Measures" of the DEIS/DEIR). Impacts resulting from vegetation removal (e.g., Section 4.7, "Biological Resources" and Section 4.14, "Visual Resources"), increased traffic (Section 4.10, "Traffic and Transportation), noise (Section 4.12, "Noise"), and dust (Section 4.11, "Air Quality") are discussed in detail in the DEIS/DEIR. Where feasible, mitigation measures are proposed that would reduce impacts to the maximum extent possible.

I4-4 See response to comment O4-16 regarding NEPA and CEQA requirements to analyze economic effects.

In general, because levee operation and maintenance is an on-going process, and engineering standards and flood zone designations change over time, levee systems will require upgrades and reconstruction. The adequacy of Federal levee systems is based upon guidance developed by USACE. The Phase 4b Project is proposed to meet those requirements. Section 1.4, "Project Purpose/Project Objectives and Need for Action," in the DEIS/DEIR provides information related to the project purpose and objectives, according to USACE and SAFCA (Section 1.4.1, "Project Purpose/Project Objectives"), background reports used in support of the need for levee reconstruction (Section 1.4.2, "Need for Action"), and deficiencies in the Natomas Basin levee system that contribute to the problems and needs related to project implementation (Section 1.4.2.1, "Flood Problems and Needs").

I4-5 In Section 4.14, "Visual Resources" of the DEIS/DIER, USACE and SAFCA acknowledge that implementation of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would result in adverse effects on scenic resources and the visual character of the Sacramento River east levee, American River north levee, and NEMDC South. This change in visual character would be attributed to the removal of a substantial number of trees, including large mature trees and Heritage oaks, from the landside and waterside of these levees. As stated in the DEIS/DEIR, Impact 4.14-a, "Alteration of Scenic Vistas, Scenic Resources, and Existing Visual Character of the Project Area," is considered to be significant. Although Mitigation Measure 4.14-a, "Implement Mitigation Measures 4.7-a, 'Minimize Effects on Woodland Habitat; Implement all Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions,' and 4.13-b, 'Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities'," in the DEIS/DEIR would reduce adverse effects, it would not be to a less than significant level and this impact would be considered significant and unavoidable.

This FEIS/FEIR will be used by the SAFCA Board as a decision making document to, in part, determine if the significant and unavoidable environmental impacts out-weigh the economic, legal, social, technological, or other beneficial impacts of the project. If the SAFCA Board determines that the significant environmental impacts are considered to be "acceptable" when compared to the benefits of the project, a statement of overriding considerations will be prepared providing the substantial evidence that was used to reach this conclusion (State CEQA Guidelines CCR Section 15093).

I4-6 Comments received on the DEIS/DEIR are addressed in this FEIS/FEIR. Comments will be used for consideration of certification of the EIR and issuance of a Record of Decision by the SAFCA Board and USACE, respectively.

I4-7 See response to comment I4-4.

I5

Henningsen, Sarah

From: Holland, Elizabeth G SPK [Elizabeth.G.Holland@usace.army.mil]
Sent: Monday, August 16, 2010 8:44 AM
To: Dunn, Francine; Henningsen, Sarah
Cc: Ruhl, Jane C LRL; Muha, Andrew T SPK; Evoy-Mount, Matilda L SPK
Subject: FW: Phase 4b Landside Improvements Project

Comments for EIS/EIR

Elizabeth Holland
U.S. Army Corps of Engineers
Senior Environmental Manager
(916) 557-6763 Cell (916) 524-8239
e-Mail Elizabeth.g.holland@usace.army.mil

-----Original Message-----
From: Melvin Borgman [mailto:melvin.borgman@yahoo.com]
Sent: Sunday, August 15, 2010 5:19 PM
To: Holland, Elizabeth G SPK
Cc: bgualco@gualco.com
Subject: Phase 4b Landside Improvements Project

Ms. Holland:

What is the current design criteria for water elevations

in the Sacramento River at Verona,
in the Natomas Cross Canal,
in the Pleasant Grove Creek Canal?

I5-1

What was the original design criteria for water elevations

in the Sacramento River at Verona,

in the Natomas Cross Canal,

in the Pleasant Grove Creek Canal?

When the river elevation at Verona is higher than the elevation of the Western Pacific Railroad, water from the tributaries of the Natomas Cross Canal system are blocked and are forced to flow north and south along the east side of the Western Pacific Railroad, flooding the area from Coon Creek to Sankey Road. The winter of 2009-2010 brought significant storms to the east Valley and west slope of the Sierra region, yet no significant flooding occurred in the Pleasant Grove area. The river at Verona never reached a 30 foot elevation and the Natomas Cross Canal system worked.

I5-2

Various "improvements"in the river system in the past 100 years such as straightening levees and channels up stream brings water to Verona faster. Improvements down stream such as levees around "islands" in the Delta and building houses, docks, bridges, etc. in the water side of the river reduce flow capacity. The gradient from Verona to the Delta is nearly zero to begin with.

I5-3

1

How can the river elevation be reduced in heavy storm conditions?

* Increase Sacramento River flow capacity.
* Make the River wider and deeper.
* Remove levees from "islands" in the Sacramento River Delta. I5-4
* Increase upstream storage capacity.
* Curtail drainage pumping by reclamation and drainage districts during periods of high river flow conditions. These districts should have internal retention facilities.

Please acknowledge receipt of this message.

Respectfully submitted,
Melvin Borgman
3559 Howsley Road
Pleasant Grove, CA 95668

Letter I5 Response Melvin Borgman August 15, 2010

I5-1 The NLIP is designed to the state of California standard as defined in Senate Bill 5 (SB 5). SB 5, signed by the Governor in October 2007, defines the State standard of the mean annual 200-year flood with at least 3 feet of freeboard between the water surface elevations and the top of the levees around the Natomas Basin. For purposes of modeling these water surface elevations, it was assumed that the levees protecting other areas in the system will not fail even if overtopped. As indicated in Table 4.5-4 of the DEIS/EIR, the 200-year no levee failure water surface elevation in the Sacramento River at Verona is 42.6 feet NGVD 29.[2] This water surface elevation rises very slightly (less than 0.1 foot) along the length of the NCC and in the PGCC due to the control exerted on water levels in these water bodies by conditions in the Sacramento River under this condition.

The original design criteria for the Sacramento River for the reach of the Sacramento River from the mouth of the NCC to the Sacramento Bypass is based upon a historical flow of 107,000 cubic feet per second (cfs). The flow was used to generate what is known as the "project floodplain," also known as the "1957 profiles." The profiles show that the "project floodplain" elevation at the mouth of the NCC is 41.2 feet C.E.[3] (or 38.2 feet NGVD 29).

The original design criteria for the NCC and PGCC are set forth in *Design Memorandum No.2, Sacramento River Flood Control Project California, Back Levees for Reclamation District No. 1000 and No. 1001 Levee Construction* dated August 1, 1957. This memorandum reflects USACE's consideration of two possible design conditions affecting flows and water surface elevations in the NCC and PGCC. "Condition A" was based ou a combination of a 'moderate' stage 39.0 feet C.E. (or 36.0 feet NGVD 29) in the Sacramento River and an estimated 200-year flood flow from the creek group feeding into the NCC. Under Condition A, design flows on the NCC and PGCC equated to 27,000 cfs and 7,000 cfs, respectively. "Condition B" was based on the "project floodplain" elevation (41.2 feet C.E.) in the Sacramento River described above and an estimated 50-year flood flow from the creek group feeding into the NCC. Under Condition B, design flow on the NCC and PGCC equated to 22,000 cfs and 6,000 cfs, respectively. The Condition B flow line controlled in all cases and was therefore adopted as the project floodplain.

USACE noted in the memorandum:

> This project flood plane provides full protection of rapidly developing urban lands in Reclamation District No. 1000 from flood conditions of project flood magnitude (estimated frequency of once in 200 years). All other lands east and north of the project levees are agricultural lands that are not expected to become urban within the foreseeable future and therefore do not require such a degree of protection. The 3-foot freeboard[4] used for the design of the levees represents a considerable factor of safety for the following reasons. The adopted flood plane rises only about 1.5 feet from the Sacramento

[2] NGVD29 = National Geodetic Vertical Datum of 1929.

[3] C.E. = U.S. Corps of Engineers Datum, C.E. datum is 3 feet below mean sea level (MSL). MSL is roughly equivalent to NGVD29.

[4] The left bank of the Sacramento River at the mouth of the NCC had a top of levee elevation of 45.9 C.E. according to the 1957 profiles. The water surface at that location is 41.2 C.E., which equates to 4.7 feet of freeboard, much greater than the 3-foot design. The levees were built before the 1957 profile design and in general have greater than 3 feet of freeboard.

River to the head of the main canal and its elevation is dominated by the 41-foot starting elevation [C.E datum] in the Sacramento River. This starting elevation cannot increase significantly because any material increase in upstream Sacramento River flows would inevitably cause extensive upstream levee failures which would allow large volumes of water to escape from the channels and prevent further rise at the mouth of the Natomas Cross Canal.

I5-2 Comment noted.

I5-3 Comment noted. See Attachment 4 of the Appendix C to the Natomas PACR for discussion regarding sensitivity to downstream conditions.

I5-4 Hydraulic analyses of the river system conclude that dredging of the Sacramento River channel does not provide long-term peak flow capacity. SAFCA has previously considered this concept and concluded that it would not improve flood water conveyance or control during peak flood conditions.

Removing levees from islands in the Delta would not appreciably influence flood elevations in Natomas. See response to comment I5-3.

Section 2.1.5, "Alternatives Considered, But Eliminated from Further Consideration," of the DEIS/DEIR addresses expansion of the Yolo Bypass and use of upstream transitory storage to reduce water surface elevations.

Pumping capacity of drainage facilities are small compared to flood flows within the channel system and therefore flood elevations could not be appreciably reduced. Flow from interior drainage facilities were ignored in generating design channel water surface profiles.

I6

Henningsen, Sarah

From: Bassett, John (MSA) [bassettj@SacCounty.NET]
Sent: Monday, August 16, 2010 9:50 AM
To: Dunn, Francine; Henningsen, Sarah
Subject: FW: NLIP Phase 4b

From: Charlotte Borgman [mailto:cborgmom@yahoo.com]
Sent: Monday, August 16, 2010 8:52 AM
To: Elizabeth.G.Holland@usace.army.mil
Cc: Bassett, John (MSA); bgualco@gualco.net
Subject: NLIP Phase 4b

Ms. Holland:

I have concerns regarding the proposed relocation of the Morrison Canal.

As you are aware, that canal supplies irrigation water to the C. Morrison Ranch as part of the Natomas Mutual Water Company system. The proposed relocation of the canal will separate a large portion of our property on the west side of SR99 from the remaining portion of the "west side" property. The proposed relocation will create a small section of land to the north of the new canal that will be difficult to cultivate, irrigate and harvest compared to the current situation. It will also cut off access to the remaining property from a well that is located in the north east corner of our property on the west side of SR99.

The proposed relocation will also isolate the northwest corner of our property on the east side of SR99 making that portion of the ranch difficult if not impossible to farm. Our supply pump from the present location of the Morrison Canal is in that northwest corner and feeds an underground pipeline that runs from there almost to the eastern border of the ranch near the "fig tree". That is a relatively new system completed in 2005.

As pictured in Plate 2-16 the proposed relocation appears to also pass through our equipment shed and the house located near it. I6-1

It is my understanding that the proposed relocation is a seepage related issue. If the levee improvements in that area included seepage controls, why is it necessary to relocate a ditch that would "catch" seepage if any occurred?

A significant portion of our ranch was lost to the improvements to SR99, including the addition of the Howsley Road interchange, and the previous relocation of the Morrison Canal to it's current location. Additional loss of property and the inconvenience of farming around the relocated canal will create a financial burden.

Respectfully submitted,
Charlotte Borgman
C. Morrison Ranch
P.O. Box 771
Pleasant Grove, CA 95668

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Letter I6 Response Charlotte Borgman, C. Morrison Ranch
August 16, 2010

I6-1 Plate 2-16 in the DEIS/DEIR is schematic in nature. As detailed plans and specifications are developed for relocation of Morrison Canal, specific impacts will be evaluated and mitigated as necessary.

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Henningsen, Sarah

From: Bassett. John (MSA) [bassettj@SacCounty.NET]
Sent: Monday, August 16, 2010 9:51 AM
To: Dunn, Francine; Henningsen, Sarah
Subject: FW: Levee Comments.doc
Attachments: Levee Comments.doc

From: CandeeR@saccourt.ca.gov [mailto:CandeeR@saccourt.ca.gov]
Sent: Monday, August 16, 2010 8:49 AM
To: Elizabeth.g.holland@usace.army.mil; Bassett. John (MSA)
Cc: tbarth@bttlawfirm.com
Subject: Levee Comments.doc

Ms. Holland and Mr. Bassett,

Attached are my comments on the DEIS/DEIR. I am also putting a hard copy in the mail today addressed to Ms. Holland.

Thanks for the opportunity to comment.

Roland L. Candee

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1

August 12, 2010

Elizabeth Holland, Planning Division
USACE, Sacramento District
1325 J Street
Sacramento, CA 95814

Subject: Comments on July 2, 2010 Draft EIS/EIR; American River Watershed Common Features Project/Natomas Post-Authorization Change Report/Natomas Levee Improvement Program, Phase 4b

Dear Ms. Holland,

My name is Roland L. Candee and I live on the Garden Highway in Sutter County. I object to the U.S. Corps of Engineers giving permission to SAFCA to proceed with the projcct, via previous authorization(s) or via any new authorization(s). It is obvious that the whole approach is flawed for reasons set out in detail in my previously submitted written comments, all of which are incorporated herein by reference. I7-1

For example, the project as it relates to the Natomas Levee has been pushed through in pieces under a claim that somehow each segment has "independent utility" – all this directly in the face of people such as myself pointing out that pieces of this project as it relates to the Natomas Levee raising have no more independent utility than one wall to a bathtub has independent utility. It now appears that the Natomas Levee raising project will not be completed anytime in the near future because of funding issues, leaving levee waterside land owners such as myself receiving all of the burdens without any complete flood protection flowing to the Natomas Basin. This approach makes a mockery of 40 C.F.R. Section 1508.25's requirement that an agency consider the effects of connected actions within a single EIS. Would the SAFCA board really have approved moving forward originally if they knew there was not enough money to complete the project? It seems perfectly realistic that the SAFCA board would have looked to expend resources on projects that could realistically be completed and not go after projects that couldn't realistically be completed. An obvious place to potentially spend less money to get to the same result would have been to lower the elevation of the Fremont Weir, taking pressure off the portion of the Sacramento River in issue with the Natomas Levee raising project. I7-2

For another example, pushing the project through in stages makes it effectively impossible for a member of the public (such as myself) to track all of the various issues and positions that a public agency such as SAFCA has taken. I went to SAFCA's offices and asked for a hard copy of this latest draft EIS/EIR so that I could try and compare what is currently written with three or four prior EIS/EIR documents and I was told the materials are only available on CD. While I appreciate the volume, I simply don't have the time or manpower available to personally print out everything and go through the comparison of the multiple voluminous documents. If the agencies had followed the legal requirement that all of the effects of connected actions be tracked within a single EIS, then I would not be left in an effectively impossible situation to accomplish a review. I could look at one document and see what, if anything, I needed to comment on. I7-3

For another example, what is the real target for how high the Natomas Levee must be raised? Prior environmental documents took the position that the needed levee height was up to three feet higher than the current Garden Highway levee elevation. I now read in your latest document that the "up to three feet higher" amount is not sufficient and the target has moved to a standard that is expressed as the 200 year flood elevation plus three feet of elevation plus an allowance for wave run-up plus an additional foot for climate change. While I do not believe that any judicial officer will have any trouble ultimately reaching the obvious conclusion that raising the levee shifts the risk of flooding from those inside the basin to those immediately outside the levee, the process of submitting this large project through in various pieces for review creates many legal issues. Would the SAFCA board really have approved moving forward originally if they knew the levee raising was going to need to immediately be followed with a subsequent project to raise the levee even higher? The obvious answer is that the SAFCA members are rational thinking, serious board members who would have been bothered by an approach that effectively damned waterside levee residents such as myself to multiple levee raising projects one after another. I7-4

Even past the consideration of inappropriately approaching this as multiple independently viable levee raising projects, the Attachment 5 to the Natomas Post-Authorization Change Report is very relevant in revealing the absurdity of taking the position, as the SAFCA board has done, that raising the levee doesn't transfer flood risk to the property of waterside land owners such as myself. If I have properly read the analysis (and I must concede that I7-5

it is confusing as written), then it appears that SAFCA is now taking the position that they (SAFCA) can legally proceed with post-authorization changes as long as there are not hydraulic impacts on the river beyond those previously authorized. Hence, despite the current admission that up to three feet of levee raise isn't going to be enough (i.e., the needed raise has gone to three feet above the 200 year flood level plus an allowance for wave run-up plus one foot for climate change), the post-authorization change report can go through and be approved because SAFCA is not technically asking for authority to raise the Natomas Levee beyond the "up to three feet" previously approved. Ironically, the reasoning as expressed in the position paper focuses on levee height as the obvious main criteria that triggers a transfer of risk and a requirement of mitigation/inverse condemnation acknowledgment. The specific language contained in the position paper notes that "(f)ix-in-place levee improvements that do not change the geometry of the hydraulic cross section, **including existing levee height** (emphasis added), would not effect the flood event hydrograph." Additional language notes that "there is no requirement for mitigation for improvements **that do not raise the height of the levee** (emphasis added)." The position paper admits that raising the levee would be "a transfer of risk of flooding from the project area to another area." How can SAFCA now admit that raising the levee is a fundamental transfer of risk yet when this levee raising was originally approved, no transfer of risk for the "up to three feet" of levee raise was ever acknowledged? The obviousness of this levee raising equals condemnation/transfer of risk tie is further revealed in the fact that this draft EIS/EIR justifies no condemnation/transfer of risk on the American River portion of the overall project specifically on the grounds that there is no raise in the height of the levee! I7-5 (Con't.)

The current draft EIS/EIR appears to continue to concede that the numbers show a rise in the river elevation level in the vicinity of my property as a result of the project, albeit a small amount and under flood conditions. I continue to object to SAFCA's choosing originally to use a .1 foot standard as an apparently claimed de minimis amount of rise in elevation when the true standard is that development must not cause any rise in base flood elevation levels. I continue to object to SAFCA apparently then changing the de minimis amount to fit with what modeling shows is present under a 500 year flood event. Even if a court allows an agency to get away with setting a de minimis standard, that agency should not be allowed to later change the chosen de minimis standard amount. 500 year flood events do happen. I also note that even if some de minimis standard is I7-6

used, there is no way to avoid the fact that the Natomas Levee project as actually constructed is now revealed to include moving and raising the Garden Highway in the vicinity of where Sankey Road has been relocated to intersect with the Garden Highway just south of where the Natomas Cross Canal joins the Sacramento River. Where the Garden Highway originally ran has now been obliterated, but it appears to me that the actual levee height is, in places, well over six feet higher than the height of the original Garden Highway and the relocation of the Garden Highway to the east is an obvious change in the hydrology of the Sacramento River channel just upriver from my property. Such actual changes to the hydrology should logically require SAFCA to admit that the project inversely condemns my property. I7-6 (Con't.)

It is now obvious that water will be added to the channel via several drains that are already in place just north (upstream) from my property. The size of the drains is obvious and can be readily measured. Surface water that previously flowed away toward the inland side of the Garden Highway is now to be directly added to the Sacramento River just north of my property. The prior SAFCA engineer, Joe Countryman, assured the SAFCA board that there was no valid claim being presented by waterside land owners because "not a drop of water" was to be added to the river. One of the SAFCA board members, on the day SAFCA approved moving forward with the levee raising project, publically told the waterside land owners present at that meeting that our claims were not being recognized by SAFCA because "not a drop of water" was to be added to the channel. Now we subsequently find out that 23 drains' worth of surface water is being directly added to the channel. Would SAFCA have authorized proceeding in the manner previously approved by SAFCA if SAFCA board members had not received the express assurance of staff that "not a drop of water" was being added to the river? With the benefit of hindsight, it is clear this "not a drop of water" argument was simply a way (now admittedly not based on true facts) to deflect the board's thinking away from the obvious transfer of risk that comes with raising the levee. I7-7

A prior comment submitted a couple of years ago (July 2008) resulted in SAFCA taking the position that *Orpheum Building Company v. San Francisco Bay Area Rapid Transit District* (1978) 80 Cal.App.3d 863, 871, was SAFCA's legal authority for taking the position that there is no claim for inverse condemnation of my property present under these facts. *Orpheum* involved a situation where the absence of any trespass was stipulated to by the parties at trial, there was no physical entry onto the I7-8

property during construction, there was no contemplation that the project would result in physical invasion of the property in the future, and the jury heard the evidence that there was a special benefit of a value of over $100,000 (proximity to a new BART station) that flowed to the property as a result of the project. Those are not the facts present here in regard to my property and the Natomas Levee raising. There will not be a stipulation of "no trespass" when my case is tried. In fact, I have photos showing that the construction has included physically placing a monitoring box on my property, an actual trespass that I would expect SAFCA to admit and acknowledge as being a physical entry onto my property during construction. Additionally, the data shows that my property will be subjected to more frequent flooding with flood levels elevated, albeit in small amounts if the SAFCA data is to be believed, from the prior pre-project status quo. And I do not believe that there is any special benefit of any nature that flows to my property as a result of the project.

If, as I contend the evidence shows, my property is being effectively inversely condemned, then I am entitled to be compensated as required by law. My belief is that SAFCA's delay in acknowledging the inverse condemnation has significantly increased my damages. An argument can be made that the date of the take is no later than the date SAFCA's board originally authorized the project to proceed. I believe my immediate neighbor had his property on the market at the time of the SAFCA original board action for approximately $1.7 million. That property has remained on the market for almost the entire time since the original SAFCA board action and is now on the market for less than $1 million. The levee project's existence appears to be the obvious answer for why the property hasn't sold. I7-8 (Con't.)

Under the circumstances, as a minimum, any permission, permits, or authorization granted by the U.S. Army Corps of Engineers allowing the Natomas Levee project to proceed should require SAFCA to admit that the property of myself and my neighbors who live on the waterside of the current Garden Highway in areas where the levee is being raised is being inversely condemned and SAFCA should proceed as required by law in an inverse condemnation situation.

Roland L. Candee
10411 Garden Highway
Sacramento, CA 95837

Letter	
I7	Roland L. Candee
Response	August 16, 2010

I7-1 See responses to comments I7-2 through I7-8.

I7-2 USACE and SAFCA have prepared the NLIP environmental documents, including the DEIS/DEIR, in accordance with NEPA and CEQA, in particular the tiering provisions (see Section 1.5, "Environmental Regulatory Framework and Relationship of this EIS/EIR to Other Documents," of the DEIS/DEIR). USACE and SAFCA have strived to ensure that the NLIP environmental documents are understandable to decision makers and to the public, while still containing the level of detail necessary for a robust and technically adequate analysis aimed to withstand legal scrutiny. To help facilitate clarity, the NLIP environmental documents, including the DEIS/DEIR, include numerous plates, tables, and formatting considerations that explain and illustrate the relationship of the Phase 4b Project to the entire NLIP.

As explained in Section 1.1.1, "Scope of Environmental Analysis," of the DEIS/DEIR, the DEIS/DEIR is tired from and incorporates by reference the previous NLIP environmental documents. As explained in Sections 1.5.1, "National Environmental Policy Act," and 1.5.2, California Environmental Quality Act," of the DEIS/DEIR, this approach is encouraged by both NEPA (see, e.g., CEQ Regulations, 40 CFR Section 1500.4, 1502.21) and CEQA. CEQA requires tiering whenever feasible as determined by the lead agency, and authorizes lead agencies to treat large and complex, phased projects first in a general program-level analysis and then analyze subsequent actions within the program at a project level of detail while incorporating by reference (see California PRC Sections 21068.5, 21093, 31094). CEQA provides numerous alternative ways to accomplish the purposes of tiering (see, e.g., the State CEQA Guidelines CCR Sections 15152, 15157, 15168, 15385; see also CCR Section 15150 [incorporation by reference]). Thus, by tiering, the environmental effects associated with an entire suite of related actions are analyzed to the extent possible in a program-level document, and then specific actions within the program are analyzed at a project level when sufficient detail exists to perform project-level analysis.

USACE and SAFCA analyzed the impacts of the entire NLIP, including cumulative impacts, in the Phase 2 EIR (SAFCA 2007) and Phase 2 EIS (USACE 2008). Because this very large project is a phased project, as disclosed in the Phase 2 EIR and EIS, subsequent documents analyze the impacts of the Phase 3, 4a, and 4b Projects. Because USACE and SAFCA considered the impacts of the Phase 4b Project, incorporating by relevant program-level analysis by reference as authorized by NEPA and CEQA, USACE and SAFCA have considered the entirety of the Phase 4b Project and its relationship to the larger NLIP, of which it is a project phase, in the manner expressly provided for by NEPA and CEQA. The DEIS/DEIR, and all previous NLIP environmental documents, examined the cumulative effects of the NLIP and the Phase 4b Project consistent with the requirements of NEPA and CEQA. Because the effects of the entire NLIP have been disclosed in program-level documents, and the impacts of the NLIP and project phases have been analyzed in relation to the cumulative context, there is no factual basis to support the contention that the NLIP has in any way been piecemealed or segmented.

The comment regarding the methods for project funding is not a comment on the DEIS/DEIR. If there is insufficient funding for the Phase 4b Project, it will not be built and the identified environmental impacts will not occur.

The proposed alternative that would provide flood control by increasing flooding of the Yolo Bypass previously was considered and rejected as infeasible. See Section 2.1.5, "Alternatives Considered, But Eliminated from Further Consideration," and Appendix B1 of the DEIS/DEIR.

I7-3 See response to comment I7-4. See also response to comment O4-1.

I7-4 The comment suggests that the target elevation for minimum levee heights in Natomas (i.e., 200-year flood elevation plus three feet of freeboard) has changed. This comment is supported by reference to the following statement in the Natomas PACR (page 2-12):

> [t]he State has established a preliminary draft of a standard for urban flood protection in California. This standard would require levees to have a top elevation equal to the mean 200-year water surface profile, plus three feet of freeboard, plus an allowanee for wave run-up, plus one foot to account for climate change.

This "preliminary draft standard" is not being used in Natomas, where the target elevation for minimum levee heights remains the 200-year flood elevation plus three feet of freeboard. This is made clear in the Natomas PACR (page 4-9) which states,

> [i]n establishing the design levee crown profile, a freeboard of three feet above the 200-year design water surface elevation or the existing levee crown elevation profile (whichever is higher) was used by SAFCA...Wind and wave run-up and setup were evaluated and detennined to be contained within freeboard...

I7-5 As noted in response to comment I7-4, there has been no change in SAFCA's design levee crown profile for the NLIP. As discussed in Section 4.5.2, "Impacts and Mitigation Measures," of the DEIS/EIR, raising the levees to achieve this design standard would have no significant effect on water surface elevations in the Sacramento River channel in the vicinity of the NCC. Table 4.5-4 in the DEIS/DEIR compares existing conditions to conditions with the Phase 4b Project in place, and indicates a net change of 0.01 feet for the 200-year flood with or without levee failures upstream or across from Natomas. For the 500-year flood, Table 4.5-8 in the DEIS/DEIR indicates the change would be 0.03 assuming levees upstream or across from Natomas fail when overtopped. This is a reasonable assumption considering that the over topping would affect over 33 miles of levee as indicated in Table 4.5-2 in the DEIS/DEIR.

I7-6 See responses to comments I7-4 and I7-5. As discussed in Section 5.1.5.15, "Visual Resources," of the DEIS/DEIR, levee sections in up to 15 locations along the Sacramento River east levee would be raised an additional 2–4 feet beyond the design levee crown profile to accommodate project features such as pipeline crossings and roadway intersections. For example, the text notes that:

> Where Sankey Road intersects Garden Highway in Reach C:1, the adjacent levee, which was constructed in 2009 as part of the Phase 2 Project, is an additional 3–4 feet higher for a length of approximately 40 feet, with 100–150-foot-long transitions on both sides back to the typical adjacent levee profile.

These undulations were taken into account in the hydraulic modeling and impact analyses referenced in the responses to comments I7-4 and I7-5. The contention that the "true standard" for hydraulic impact analysis is "that development must not cause any rise in base flood elevation levels" was addressed in responses to comments made by the commenter in connection with the Phase 4a Project (see response to comment I4-2 in the Phase 4a FEIS). There it is noted that "[t]he Sacramento County Floodplain Management Ordinance...states that...0.1-foot change in base flood water surface elevation shall be considered to be zero impact."

See also response to comment I7-8 regarding inverse condemnation.

I7-7 The total peak discharge to the Sacramento River from for all proposed storm drains (Station 0+00 to Station 665+00) is estimated to be 104 cfs. This is a small fraction of the flow carried by the river channel, which is in excess of 110,000 cfs, and would have no measurable effect on water surface elevations in the channel.

I7-8 See response to comment O4-16 regarding NEPA and CEQA requirements to analyze economic effects.

In the example given by the commenter, the monitoring box is within the street right-of-way, which will be confirmed by SAFCA. The monitoring box is for noise and vibration monitoring for the Phase 2 Project, as required by Mitigation Measure 3.12-a, "Implement Noise-Reducing Construction Practices, Prepare a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors," in the Phase 2 EIR. The box will be in its current location temporarily, until the end of the construction season. Therefore, there are no reasonably foreseeable economic effects on the commenter's property. With regard to whether the commenter's property will be subject to increased flooding as a result of project implementation, see responses to comments I7-4, I7-5, 7-6, and I7-7.

The NLIP will, in fact, benefit properties on the waterside of Garden Highway, like the commenter's, by preserving trees and encroachments because construction of the adjacent levee will allow these encroachments to remain in place, and by reducing the likelihood that the levee will fail and cut off access to those properties. As an additional benefit, the new levee-top roadway will have improved safety for drivers who use it for access.

To the extent that property must be acquired to implement the Phase 4b Project, USACE and SAFCA would comply with all applicable legal requirements.

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Keith M. Seegmiller
2598 Garden Highway
Sacramento, CA 95833

16 August 2010

Mr. John Bassett, Director of Engineering
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Subject: Draft EIS/EIR
NLIP, Phase 4b

Ref.: APN 225-0210-022-0000

Dear Mr. Bassett:

The following comments relative to the Subject Draft EIS/EIR are submitted in accordance with the procedures stated on page ES-23 of the DEIS/DEIR.

Specifically, these comments address certain issues and certain potential mitigation measures applicable to landside properties situated in Reach 16 and the Southern portion of Reach 15. Within this area there are at least five -- and possibly an additional one or two-residential properties. (Since I have not yet had the opportunity to discuss these matters with my neighbors, I am presently speaking only for myself.) I8-1

1. The entire NLIP Project has as its objective preventing potentially catastrofic consequences resulting from what are - BY DEFINITION - episodic flooding events. Since I have lived in my home on Garden Highway - for thirty-three years - such events have happened only twice -- 1986 and 1997.

2. In my reading of the Subject DEIS/DEIR, I have not found any discussion of of the installation of "Relief Wells." If I am mistaken, I would appreciate being directed to the appropriate sections of The DEIS/DEIR. (I am referring, of course to "Relief Wells"relative to Reaches 15 and 16.) I8-2

3. My understanding is that, within Reaches 15 and 16, both active alternatives involve the construction of "barrier walls." ... PLUS the creation of
* an "adjacent levee" AND untold hundreds of thousands of cubic yards of soil for multiple acres of "berm" to a possible depth of nine feet. I8-3

4. I believe that "Relief Wells" (in addition to a barrier wall and a single "Adjacent levee") are much more effective in mitigating the results of episodic flooding than millions of tons of dirt built on the assumption that tonnage will sufficiently compress the underlying soils to prevent underseepage. I8-4

* Not true for the "Fix-in-Place" alternative

SAFCA '10 AUG 16 PM2:26

Page 2

--Ongoing, annual well maintenance and repair work for the "Relief Wells" can be billed/assessed to the beneficial properties (in lieu of the up-front capital costs of property acquisition and dirt hauling).

-- On Garden Highway, we are familiar with the operstion of domestic water wells and the expenses of maintaining tham. (We are also familiar with the deeper water supply wells drilled by the local farmers into the natural water table for irrigation water.) In 33 years, I believe I have had occasion twice (maybe three times) to do underground well maintenance -- and that for 24/7/365 water service. (I understand that the "Relief Wells" would be significantly deeper, which could entail higher maintenance charges.)

-- In other words, please deal with the potential problems of "underseepage" WHEN THEY OCCUR! Remove the water. Don't just pile tonnage of dirt on top of the existing soils.

I8-4 (Con't.)

5. In addition, I am the custodian of five (5) Heritage Oaks on my property. I believe that some significant consideration should be given to preserving these trees. An extensive "berm" - to the depth of nine feet -- would clearly kill them.

I8-5

6. I have been a participant in a few informal conversations concerning the possibility/feasibility of installing such "Relief Wells" along this stretch of approximately one-half mile. I have not yet been aware of any in-depth analysis/consideration of this alternative for this location.

(Again, if I am mistaken, please direct me to the appropriate documents.)

I8-6

I respectfully request that detailed consideration and analysis of the alternative of (1) Adjacent levee, (2) barrier wall**, and (3) Relief Wells be given thorough consideration -- in consultation with the affected property owners.

I8-7

Respectfully submitted,

Keith M. Saegmiller

** I also remember that a (INADEQUATE) barrier wall was constructed along this portion of Garden Highway in the late 1980s &/or early 1990s.

Letter I8 Response	Keith M. Seegmiller August 16, 2010

I8-1 See responses to comments I8-2 through I8-7.

The Phase 4b Project objectives are described in Section 1.4, "Project Purpose/Project Objectives and Need for Action," of the DEIS/DEIR.

I8-2 The footprint for levee improvements that are proposed to be constructed in Sacramento River east levee Reach B:15 are described in the Phase 4a EIS/EIR. Final design is ongoing for this project phase, and the exact locations of relief wells, if any, have not been finalized.

For Sacramento River east levee Reach B:16, Table 2-2 in the DEIS/DEIR notes that relief wells are a potential element. Relief wells would be constructed at selected locations where berms cannot be wide enough or cutoff walls deep enough to meet the required design parameters for seepage remediation. The need for relief wells in Sacramento River east levee Reach B:16 would be determined during final design. Each of the seepage remediation methods, including relief wells, are discussed in Section 2.1.3.2, "Seepage Remediation," of the DEIS/DEIR.

I8-3 Comment noted. See Chapter 2, "Alternatives," of the DEIS/DEIR.

I8-4 Comment noted. See response to comment I8-2.

I8-5 Impact 4.7-a, "Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats," of the DEIS/DEIR addresses loss of oak woodland, including Heritage oaks. Table 4.7-2 in the DEIS/DEIR provides an estimate of the acreage that would be lost if the maximum levee improvement footprint (see Plates 2-7a and 2-7b in the DEIS/DEIR) were to be constructed. A woodland compensation plan is described in Section 2.3.4.2, "Woodland Compensation," in the DEIS/DEIR and this impact is also addressed by Mitigation Measure 4.7-a, "Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code," of the DEIS/DEIR.

I8-6 See response to comment I8-2.

I8-7 See responses to comments I8-1 through I8-6.

I9

2342 Swainson Way
Sacramento, CA 95833
rjjohnson916@yahoo.com

August 16, 2010

John Bassett, P.E.
Director of Engineering
Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Dear Mr. Bassett,

RE: Natomas Levee Improvement Program Phase 4b Landside Improvements Project

Subject: Draft EIS/EIR Comments

I am a homeowner within the River Oaks Community Association (ROCA) and my property is located within 800 feet of Garden Highway. After review of the Draft Environmental Impact Statement/Draft Environmental Impact Report dated July 2, 2010, I have several concerns that carry over from my comment letter based on my review of the NOP. I9-1

- **Power pole relocation** (page 2-30)- Relocating power poles to the waterside of the existing levee is acceptable, but it is preferred that they be undergrounded and placed at shallow depths above the 0.005 AEP flood surface elevation similar to the reconstructed pump station discharge pipes. Any above grade facilities can be placed on either side of the road. Relocating the existing land side power poles from the top of the levee down to the bottom of the slope is not acceptable. These are a real eyesore to put into our neighborhoods that were built to specifically avoid these and are a serious concern. I9-2
- **Seepage berm, up to 250' wide in addition to the adjacent levee construction at Tim Lewis** -. It appears that the berm and its grade transitions will extend all the way to the sidewalk along Wheelhouse Avenue.
    - Confirm the treatment to the top of it. A combination of natural park to replace the lost trees in the grove at the west end with manicured park is desired, including incorporation of a community park which has been planned near the I-80 crossing.
    - Provide beautification at the 12' wide transition slope behind the sidewalk. Leaving the existing temporary ditch that is weed filled and a magnet for trash is unacceptable as a permanent solution. I9-3
- **Existing Bike Trail along Swainson Way** (Upper figure on Page 2-101)-
    - Widening the levee and removal of the existing walk/bike path along the south side of Swainson Way/Avocet Court is an unacceptable loss. This is a heavily used pedestrian route in our community, and this path provides an important access between the Shorebird and Warmington subdivisions. It in part acts as an informal extension of Shorebird Park. I9-4

- Utilization of the future bike trail at the top is unacceptable, replacement of this path at the levee toe elevation is a must.
  - There will not be sufficient access points to provide similar access between Avocet and Marina Glen.
  - Using said trail would not only be highly inconvenient given the grade differential, but it would also be unsafe given the proximity to the very high speed traffic on Garden Highway.
- The retaining walls proposed through here need to be further setback and the height increased in order to maintain a minimum 6' wide walk along this stretch.
  - The retaining walls must not be a plain masonry unit or similar construction, and a design which will not attract graffiti. Rockery (Parson's) stone gravity walls as used in Folsom would be acceptable as they are less prone to graffiti, and provide a natural blending that a masonry unit wall does not. Should masonry unit be used, veneers and other architectural details that match other walls in the development need to be used.

I9-4 (Con't.)

- **Shorebird Park** (Upper figure on Page 2-101)-
  - Shorebird Park must be reconstructed to replace any walks, trees, or other amenities removed or otherwise disturbed by the construction. Loss of the walk along the south side is unacceptable.

I9-5

- **City of Sacramento Pump 160**
  - The drive access from Garden Hwy must be reconstructed as needed. Access from the residential area to Garden Hwy is an important connection for this immediate neighborhood, particularly with the loss of the old driveways at Marina Glen.

I9-6

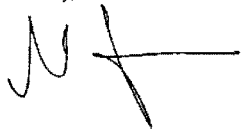
- **Access at W. River Drive/Wheelhouse Avenue**
  - This drive access from Garden Hwy must also be reconstructed as needed. This provides a key access from the residential area to Garden Hwy as well as to Sand Cove Park across the street from the access.

I9-7

Please incorporate these comments into your documentation. If you have any questions, please feel free to contact me via email or USPS mail.

I9-8

Sincerely,



Ronald Johnson, P.E.

Letter I9 Response	Ronald Johnson, P.E. August 16, 2010

I9-1 See responses to comments I9-2 through I9-8.

I9-2 Detailed engineering specifications, including the relocation of power poles, will be developed during final design. The options described by the commenter are still under consideration.

I9-3 Detailed engineering specifications will be developed during final design.

I9-4 The DEIS/DEIR addresses the potential environmental impacts of a worst-case levee improvement footprint. Approaches to avoiding encroachment on public facilities would be considered during final design. Mitigation Measure 4.13-c(1), "Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair of Damage to Recreational Facilities," requires coordination with local jurisdictions to restore access and repair or reconstruct any construction-related damage to bicycle facilities.

I9-5 See response to comment L5-4.

I9-6 See responses to comments L3-3 and L5-4.

I9-7 See responses to comments L3-3 and L3-4.

I9-8 See responses to comments I9-1 through I9-7.

PUBLIC HEARING

PH

Clerk:
Our next Item is a Timed Item:
Item 1 Public Hearing – Draft Environmental Impact Statement/Environmental Impact Report on the American River Watershed Common Features Project/Natomas Post-Authorization Change Report/Natomas Levee Improvement Program Phase 4b Landside Improvements Project

Tim Washburn:
Mr. Tretheway, Members of the Board, Tim Washburn, Director of Planning. This is a Public Hearing item, an opportunity for folks in the community to offer comments on the joint Environmental Impact Report/Environmental Impact Statement that was issued on July 2nd by the Corps, with the cooperation of the Central Valley Flood Protection Board and SAFCA. I am going to give some brief comments, take any questions the Board may have, and then ask you to open it up and take any comments that may be for the public.

So as the Board is aware, I mean this is the sixth environmental document that we have issued in the last three years. We started as you recall, in the beginning of 2007, with a program EIR that looked at the entire 200 year protection plan for SAFCA that was the basis for our forming the assessment. We followed up with a Project Level but also Program Level look at the Natomas Levee Improvement Program. Later in 2007, an EIS that complemented that document was issued at the beginning of 2008 and since then we have of course, issued two more Environmental Impact Reports and Environmental Impact Statements.

This is unprecedented, that we have been able to maintain this pace in analyzing these problems and proceeding with these documents through the process. And now we have arrived at a point where we believe this is the last document in the series, and it is a document that will cover the transition from the SAFCA led project, which is where we have been for the last three years, to the Corps coming on the scene and taking over the Project and commencing to construct the remainder of it.

So just to remind the Board, our environmental documents will bring us along and we've completed most of the Natomas Cross Canal. We have a substantial amount of the Sacramento River east levee done. We expect that we will be awarding a final contract on our part to carry us down past Powerline Road into the vicinity of Fisherman's Lake and from that point forward, we will hand the baton, by in large, to the Corps. So this document covers the elements of the Project that we have not yet evaluated in the five previous documents, at a level of detail and so that is the lower part of the Sacramento River east levee, essentially from San Juan Road down to I-5; the American River north levee from I-5 over to Northgate; and then

the upper part of the Natomas East Main Drain west levee, from Elkhorn up to Sankee Road. All other pieces of the perimeter were analyzed in prior documents, so this one focuses on those reaches and analyzes the impact of the Project there, but it also adds some elements that we've picked up from prior documents that weren't analyzed.

In particular, we are going to be re-aligning and altering the slope on the RD 1000 west drainage cannel from I-5 over to Fisherman's Lake. We are going to be doing some work along Pleasant Grove Creek Canal Levee that was not analyzed in prior documents, in particular, we have to either remove or improve five culverts that drain water from the Pleasant Grove area into Natomas and we still need to raise the Pleasant Grove Creek Canal levee slightly, about a foot, and we need to raise a portion of the Natomas East Main Dain west levee at the upper end, about a quarter mile or maybe a half mile.

The rest is levee strengthening. And so nothing that the Board hasn't heard about, cut-off wall construction where that is feasible, we do have to on the east side of the basin along the NEMDC west levee, probably widen that levee section because it is over steepened on the waterside and to be stable, it needs to be widened and that will require us probably to relocate Natomas East Levee Road and it should be noted, we are now going to be getting into a more heavily populated part of Natomas.

We have generally been operating in the northern and western part of the basin which is basically agricultural. As we get down the Sac River east levee, the parcels get smaller on the landside and for the first time, we will be confronting the challenges of improving the levee where there are urban subdivisions. And so this document foreshadows those challenges, evaluates those impacts and offers mitigation measures for the impacts that may result. We are going to most likely be removing a lot more landside trees. Those of you who have driven along the Garden Highway, in the Reach between the RD 1000 office and say down to the Arden/Garden, or say Northgate, there is a lot of trees at the landside tow of the levee there and this document suggests, analyzes and anticipates that those trees will have to be removed as part of the design of the Project, in order to flatten the back slope of the levee and in order to meet Corps requirements for maintaining Operation and Maintenance Roadways, at the toe of the levee.

Those trees will be mitigated within the corridors that we have been creating as part of our Project and also a substantial mitigation in the document, is anticipated in Lower Dry Creek where SAFCA and the City of Sacramento own substantial lands there, that will accommodate 40 to 50 acres of mitigation in Lower Dry Creek. But there will be trees taken out that are now close to where people now live and that will be a challenge for us.

We also face the challenge of dealing with all of the infrastructure that passes through and over the levees as you get into these urban areas: electrical/utility lines; natural gas lines; water mains; storm water facilities, these will pose major challenges to our design and construction capability and these also are analyzed in what we have referred to as the Phase 4b Document.

This is going to be a challenging part of the Project. We are happy that we have the Corps of Engineers to be able to step up to this challenge and of course we will assist them in every way we can. The purpose of this item is to appraise you of the issuance of this document, which occurred on July 2, and there is a 45 day document period that will remain open until August 16th. We will then quickly respond to any comments that we receive on the EIS/EIR and issue a Final EIS/EIR in the early part of September. It will go through a 30 day review process as is required under NEPA. We will then be required to respond to any comments we get on that Final document and bring this document to a position where it can be certified by this Board and approved by the Corps, toward the end of the year.

So that is the process going forward, this is an essential part of our bringing this Project forward for federal authorization and approval and for turnover to the Corps for construction. I would be happy to answer any questions you may have on the scope of this document.

Chairman Tretheway:
Okay I'll see if we have any questions at this time.
Mr. Shiels

John Shiels:
What is the Natomas Levee Class One Bike Trail Project?

Tim Washburn:
The, that project is a county sponsored project and the county, the Department of Transportation, specifically approached us and requested that we include in the description of the Project, the eventual construction of a bike trail on the adjacent levee that we are constructing around Natomas. We thought that was a reasonable request and so it is being included in the Environmental Document for environmental coverage. It is going to be up to the County of Sacramento, working with the City to advance that project forward in terms of actual permitting and construction.

John Shiels:
So we are not expecting to spend any, commit any funds…

Tim Washburn:
No, it is not in the SAFCA NLIP, it is an additional project that the County and the City would sponsor.

John Shiels:
Okay. I want to be sure that if that project goes forward, that it is understood that there are conditions that RD1000 has, that must be met.

Tim Washburn:
Yes, I think we have gained some valuable experience in building the WYDA Bike Trail on the NEMDC west levee. I think we have some experience and background to, to go from there.

John Shiels:
Thank you.

Chairman Tretheway:
Are there any other questions? Tim --this is the second public hearing?

Tim Washburn:
Yes, we had a Public Hearing in the South Natomas Community Center on Tuesday. There will be another one on the 21st I believe, a 3rd Public Hearing.

Chairman Tretheway:
And that is at the County Board of Supervisors?

Tim Washburn:
Yes.

Chairman Tretheway:
The one on Tuesday, what -- anyone show up and any comments?

Tim Washburn:
To be honest, it was not a very large turn out of the public. No. Now I should say, we have by direct mail notification, notified 900 property owners in the footprint of this Project, along the Garden Highway, on both sides of the Garden Highway, and the lower Sacramento River and along the American River north levee. So I don't know whether that suggests that people haven't paid attention to the notice or aren't interested or not sure.

Chairman Tretheway:
Well, it is only 700 pages, right? Okay we have no body signed up today to speak?

Clerk:
That's correct.

Chairman Tretheway:
Anybody? It is an opportunity to fill out the form and speak? Okay sign up afterwards - just introduce yourself and then ... can we help him get a sign up sheet

Clerk:
There is one on the lecturn.

Tim Washburn:
If you would open the Hearing, then we will record the statement

Chairman Tretheway:
Okay, so the Public Hearing is now open.

Phil Perry:
Very good. My name is Phil Perry. I am a resident that lives within about a block of the levee in the Bree/Sisto Rio Development. My property abuts the Reclamation District slough that goes to Pumping Plant 1. PH-1

Couple of concerns, I have not read the whole document, shame on me. What I do notice is the impact that it is going to have on our local area, just as a taxpayer it is a little concerning that we went through a levee improvement project years ago and that seems to have gone for not. So I apologize if I am somewhat reluctant to endorse this project as a local homeowner because I have already gone through this a few times and just recently when, and it kind of concerns me that we just recently filled in the area where the pumping plant is and looking at the document, it would appear that much of that will be taken apart again because they are going to have to raise all of the outlet pipes up and over the levee at the location. PH-2

According to the EIR, the original pumping – or I guess its 2, Number 2, which is in the old building. A lot of those pumps are going to have to be taking out they are going to have to make higher output because they are going to have to get more of a head to get up and over the levee. Strikes me as that is something that could have been looked at when they were filling in the slurry wall that they hadn't completed.

Those are the kind of things that cause me to doubt that this is being viewed in the most strategic way. The trees obviously it is quite sad the idea that one of the reasons I moved to the area is the bucolic look of it and that is going to be stripped clean. We're going to have basically a straight levee that is on La Lima Way there that now we have a number of wonderful trees. The park that is down the street, PH-3

down by Chevy's, I would imagine, that will lose a large portion of trees and it just kind of changes the look of the place. PH-3 (Con't.)

It seems there would be better and cheaper ways to do this, considering the improvements that have been made up river, considering the other improvements that have been made. I just want the Board to ensure they are looking at this as the most cost effective way of actually doing these repairs and make it safe. I also realize that I am also in a quite small minority, because I think you would find that anybody that lives much further away from the levee than I do, doesn't give a darn that it is going to be stripped clean. PH-4

They, there for the first time they started paying flood insurance. I have been paying it for 21 years living over there. It was very nice when it was down to $300 a year, this year we're up to a grand this year and next year we should be down to $300 again, so it's a pretty good deal. The people that live in the interior, that haven't been paying flood insurance, I feel for them, but it's a fairly small price. I am just asking that you guys look at this closely. I realize this is a comment period and I also understand that comments just basically get in the record. I am not sure really what kind of impact it has on the EIR in any way shape or form, thank you. PH-5

Chairman Tretheway:
Thank you Mr. Perry. I do believe I can share with you that your comments that are germain to the EIS/EIR will be replied to in the Final draft. Correct? As is every public comment either written or oral. Stein.

Stein Buer:
I would like to supplement Tim's very good summary by reminding the Board and the public that the document casts an envelope of likely maximum environmental impacts and we will be working with the community, people like Mr. Perry and others, to minimize impacts wherever we can. And we will look at each and every structure to see if there are ways that we can minimize the additional work that needs to be done.

I would also like to mention, overtime, standards have changed. And the work that has been done before has certainly been very effective in improving the level of flood protection in the basin, a comparison of 1986 and 1997 show that we solved the huge problem of water seeping through the levee and causing the backside to erode, but the standards have changed and we have to meet those new standards to maintain or regain our accreditation.

So it is a moving target. And we will always be working on these levees and it can be frustrating that we are back out there over and over again, but that is really the

nature of this system, we will always be working on these levees one way or another to make them better.
Thank you very much.

Chairman Tretheway:
Thank you.
Mr. Gallagher.

James Gallagher:
Yeah, one thing I wanted to add, as another important component of this EIS, is the issues with the Pleasant Grove Creek Canal and a lot of you have been on this Board for a long time, so you know there have always been some issues and impacts to the Pleasant Grove area, in Sutter County. So I know staff has already been very much working with that community, and I know that is a priority for me as well. I know this Board we want to ensure we are good neighbors and that we are working with all these communities that are in some ways impacted by this Project. This Project is a necessity, we are all here to make sure it happens, but we all want to make sure that we address those impacts as they arise.

I do want to thank Stein and staff for working on that issue, and I know as we continue to work through the process, I think we can find a way to ensure that those impacts are fully mitigated.

Stein Buer:
In fact, we do have a Public Meeting scheduled for August 4th, in the Pleasant Grove Creek area. We don't have a location yet, but the last one is not the 21st, it is August 4th, for a total of four Public Meetings on this issue, so those people in that particular area will have a convenient way to express their concerns and learn more about the project.

Chairman Tretheway:
I want to thank James for taking a leadership role up in that community. We'll button this one up finally. Do we need to close Public Hearing? It says information only

So we need to close public hearing with a motion.

Virgina Moose:
So moved.

John Shiels:
Second.

Chairman Tretheway:
Second by Mr. Shiels. All in favor please say "aye"

All:
"I"

Chairman Tretheway:
Any noes or abstenstion?
Thank you.

Letter PH Response	Public Hearing Excerpt of Board of Director's Meeting July 15, 2010

PH-1 Comment noted.

PH-2 The DEIS/DEIR provides analysis of the maximum environment impacts that could occur under the Phase 4b Project. If Congress authorizes the Phase 4b Project, SAFCA and USACE will prepare the detailed plans and specifications to minimize impacts to existing structures.

PH-3 See response to comment I4-5.

PH-4 See response to comment I4-4.

PH-5 Flood insurance requirements and rates are not determined by USACE or SAFCA. The Federal Emergency Management Agency defines AE zones as areas with a 0.01 annual exceedance probability of flooding. The designation requires mandatory flood insurance purchases by homeowners.

References

Buck, Peter. Natural Resources Supervisor. SAFCA, Sacramento, CA. October 27, 2009—email to Marianne Lowenthal of AECOM regarding previous woodland planting success rates.

Sacramento Area Flood Control Agency. 2009 (October 23). *Construction Specifications for the: Natomas Levee Improvement Program Phase 2 Woodland Corridor Mitigation and Enhancement Project Contract 4043.* Prepared by EDAW/AECOM, Sacramento, CA.

U.S. Army Corps of Engineers. 1957 (August 1). Design Memorandum No. 2, Sacramento River Flood Control Project. California, CA.

FOR CONTINUATION OF HOUSE DOCUMENT 112-66

AMERICAN RIVER WATERSHED, CALIFORNIA: COMMON FEATURES PROJECT: NATOMAS BASIN

SEE PART 4