APPENDIX F

Correspondence Regarding Cultural Resources

EDAW Inc
2022 J Street, Sacramento, California 95814
T 916.414.5800 F 916.414.5850 www.edaw.com

June 7, 2007

Debbie Pilas-Treadway
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, Ca 95814

RE: Natomas Levee Improvement Project

Dear Ms. Pilas-Treadway:

EDAW is conducting cultural resources studies for the above-referenced project located generally north of the City of Sacramento, in Sacramento and Sutter counties, and located on the Grays Bend, Taylor Monument, Verona, Rio Linda, Pleasant Grove, Sacramento East, and Sacramento West USGS quadrangle maps. Background research and field studies conducted for this project will identify cultural resources that may be impacted by proposed levee improvements throughout the American River basin. This letter is intended to initiate part of the consultation process that will eventually be required under Section 106 National Historic Preservation Act.

I am pleased to bring this activity to your attention, and would appreciate any information you can provide regarding prehistoric, historic, or ethnographic Native American land use. I am interested in any contemporary Native American values that may be present near or within the project area and would like to request a search of the NAHC Sacred Land files.

Please send via mail or facsimile (916-414-5850) a listing of local Native American representatives at your earliest convenience, so that I may contact appropriate individuals and account for their potential concerns in the planning process.

If you have any questions or comments feel free to contact me at my office. I can be reached by email at charlane.gross@edaw.com, or by phone at 916-414-5800. I look forward to hearing from you soon.

Sincerely,

Charlane Gross, M.A., R.P.A.
Senior Archaeologist

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390

June 19, 2007

Charlene Gross
EDAW Inc.
2011 J Street
Sacramento, CA 95814

Sent Via Fax: 916-414-5850
Of Pages: 3

RE: Natomas Levee Improvement project, Sacramento and Sutter Counties

Dear Ms. Gross:

The Native American Heritage Commission has reviewed the Sacred Lands File and found several burial/recorded sites in/near the project area. The location of sites is confidential.

I recommend that you contact the North Central Information Center, Ca State University, Sacramento, 6000 J Street, Adams Building, Suite 103, Sacramento, CA 916-278-6217 for sites in Sacramento County and Northeast Information Center, Ca State University, Chico, Building 25, Suite 204, Chico, CA 95929, 530-898-4413 for Sutter County, for further information of recorded sites located in/near the APE.

I have enclosed a list of Native Americans individuals/organizations contacts may have knowledge of additional cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. These lists should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend other with specific knowledge. A minimum of two weeks must be allowed for responses after notification.

If you receive notification of change of addresses and phone numbers from any these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

If you have any questions or need additional information, please contact me.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
Sacramento and Sutter Counties
June 19, 2007

√ = CALL
√ = CALL W/MESSAGE
√+ = CALL SPOKE W/INDIVIDUAL (SEE CALL LOG RECORD)

√+
Rose Enos
15310 Bancroft Road — Maidu
Auburn , CA 95603 — Washoe
(530) 878-2378

Shingle Springs Band of Miwok Indians
Nicholas Fonseca, Chairperson
P.O. Box 1340 — Miwok
Shingle , CA 95682 — Maidu
nfonseca@ssband.org
(530) 676-8010
(530) 676-8033 Fax

√
Enterprise Rancheria of Maidu Indians
Frank Watson, Vice Chairperson
1940 Feather River Blvd., Suite B — Maidu
Oroville , CA 95965
eranch@cncnet.com
(530) 532-9214
(530) 532-1768 FAX

Strawberry Valley Rancheria
Calvine Rose, Chairperson
PO Box 667 — Maidu — No #
Marysville , CA 95901 — Miwok

√
Enterprise Rancheria of Maidu Indians
Glenda Nelson, Chairperson
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(530) 532-9214
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Strawberry Valley Rancheria
Robert Kerfoot
PO Box 667 — Maidu — No #
Marysville , CA 95901 — Miwok

√
Shingle Springs Band of Miwok Indians
Jeff Murray, Cultural Resources Manager
P.O. Box 1340 — Miwok
Shingle , CA 95682 — Maidu
jmurray@ssband.org
(530) 676-8010
(530) 676-8033 Fax

√
United Auburn Indian Community of the Auburn
Jessica Tavares, Chairperson
575 Menlo Drive, Suite 2 — Maidu
Rocklin , CA 95765 — Miwok
916 663-3720
916 663-3727 - Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Natomas Levee Improvement project, Sacramento and Sutter Counties.

Native American Contacts
Sacramento and Sutter Counties
June 19, 2007

United Auburn Indian Community of the Auburn
Tribal Preservation Committe
575 Menlo Drive, Suite 2 Maidu
Rocklin , CA 95765 Miwok
916 663-3720
916 663-3727 - Fax

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EDAW Inc
2022 J Street, Sacramento, California 95814
T 916.414.5800 F 916.414.5850 www.edaw.com

June 21, 2007

United Auburn Indian Community of the Auburn
Tribal Preservation Committee
575 Menlo Drive, Suite 2
Rocklin, CA 95765

Subject: Natomas Levee Improvement Project(s)

To Whom It May Concern:

EDAW, Inc., an environmental firm, has been retained to complete an Environmental Impact Report (EIR) for various SAFCA (Sacramento Area Flood Control Agency) levee improvement projects throughout the American River Basin in both Sacramento and Sutter Counties (see attached map). There are few specific planned improvements as yet, but the projects may include levee strengthening or widening, excavation for slurry walls or canals, soil removal from various borrow sites throughout the basin, and similar types of projects. The work will be conducted over the next several years, but EDAW is collecting cultural resources information now to help guide planning decisions made for the individual elements of this much larger effort.

We would appreciate your help in identifying any concerns you or your community may have regarding any cultural resources in the study area. Please return the enclosed response form. Returning this form does not imply that you approve or disapprove of the study, nor does it limit your opportunity to comment at a later time. Efforts to address your concerns will be included in the planning process.

In order to incorporate your concerns and/or input in any forthcoming reports, we would appreciate receiving your comments by July 10th.

If you have questions, please contact me at (916) 414-5800.

Sincerely,

Charlane Gross, M.A., RPA
Senior Archaeologist

Enclosures: Map, Response form, SASE

EDAW Inc
2022 J Street, Sacramento, California 95814
T 916.414.5800 F 916.414.5850 www.edaw.com

June 21, 2007

United Auburn Indian Community of the Auburn
Jessica Tavares, Chairperson
575 Menlo Drive, Suite 2
Rocklin, CA 95765

Subject: Natomas Levee Improvement Project(s)

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Senior Archaeologist

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EDAW Inc
2022 J Street, Sacramento, California 95814
T 916.414.5800 F 916.414.5850 www.edaw.com

June 21, 2007

Strawberry Valley Rancheria
Robert Kerfoot
P.O. Box 667
Marysville, CA 95901

Subject: Natomas Levee Improvement Project(s)

Dear Mr. Kerfoot:

EDAW, Inc., an environmental firm, has been retained to complete an Environmental Impact Report (EIR) for various SAFCA (Sacramento Area Flood Control Agency) levee improvement projects throughout the American River Basin in both Sacramento and Sutter Counties (see attached map). There are few specific planned improvements as yet, but the projects may include levee strengthening or widening, excavation for slurry walls or canals, soil removal from various borrow sites throughout the basin, and similar types of projects. The work will be conducted over the next several years, but EDAW is collecting cultural resources information now to help guide planning decisions made for the individual elements of this much larger effort.

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June 21, 2007

Strawberry Valley Rancheria
Calvine Rose, Chairperson
P.O. Box 667
Marysville, CA 95901

Subject: Natomas Levee Improvement Project(s)

Dear Mr. Rose:

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June 21, 2007

Single Springs Band of Miwok Indians
Nicholas Fonseca, Chairperson
P.O. Box 1340
Shingle Springs, CA 95682

Subject: Natomas Levee Improvement Project(s)

Dear Mr. Fonseca:

EDAW, Inc., an environmental firm, has been retained to complete an Environmental Impact Report (EIR) for various SAFCA (Sacramento Area Flood Control Agency) levee improvement projects throughout the American River Basin in both Sacramento and Sutter Counties (see attached map). There are few specific planned improvements as yet, but the projects may include levee strengthening or widening, excavation for slurry walls or canals, soil removal from various borrow sites throughout the basin, and similar types of projects. The work will be conducted over the next several years, but EDAW is collecting cultural resources information now to help guide planning decisions made for the individual elements of this much larger effort.

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June 21, 2007

Shingle Springs Band of Miwok Indians
Jeff Murray, Cultural Resources Manager
P.O. Box 1340
Shingle Springs, CA 95682

Subject: Natomas Levee Improvement Project(s)

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T 916.414.5800 F 916.414.5850 www.edaw.com

June 21, 2007

Enterprise Rancheria of Maidu Indians
Glenda Nelson, Chairperson
1940 Feather River Blvd., Suite B
Oroville, CA 95965

Subject: Natomas Levee Improvement Project(s)

Dear Ms. Nelson:

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Frank Watson, Vice Chairperson
1940 Feather River Blvd., Suite B
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Subject: Natomas Levee Improvement Project(s)

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Senior Archaeologist

Enclosures: Map, Response form, SASE

EDAW Inc
2022 J Street, Sacramento, California 95814
T 916.414.5800 F 916.414.5850 www.edaw.com

June 21, 2007

Rose Enos
15310 Bancroft Road
Auburn, CA 95603

Subject: Natomas Levee Improvement Project(s)

Dear Ms. Enos:

EDAW, Inc., an environmental firm, has been retained to complete an Environmental Impact Report (EIR) for various SAFCA (Sacramento Area Flood Control Agency) levee improvement projects throughout the American River Basin in both Sacramento and Sutter Counties (see attached map). There are few specific planned improvements as yet, but the projects may include levee strengthening or widening, excavation for slurry walls or canals, soil removal from various borrow sites throughout the basin, and similar types of projects. The work will be conducted over the next several years, but EDAW is collecting cultural resources information now to help guide planning decisions made for the individual elements of this much larger effort.

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Charlane Gross, M.A., RPA
Senior Archaeologist

Enclosures: Map, Response form, SASE

EDAW

Project Name: 05110058.01
Project Number: SAFCA / N. NATOMAS LEVEE

Telephone Contact Report

CONFIDENTIAL

Call Participants: LBM – ROSIE ENOS

Title: ? – MAIDU / WASHOE CONTACT

Initiated By: LBM

Organization: (SEE ABOVE)

Phone Number: 530-878-2378

Location: EDAW SAC

Subject: SAFCA / NATOMAS C.C. LEVEE

Date/Time: 7-9-07 12:30

Discussion Item(s):

– CONCERN IS BURIAL SITE AVOIDANCE

– WOULD LIKE ANY INFORMATION CONCERNING ANY FURTHER WORK CONCERNING SUCH SITES

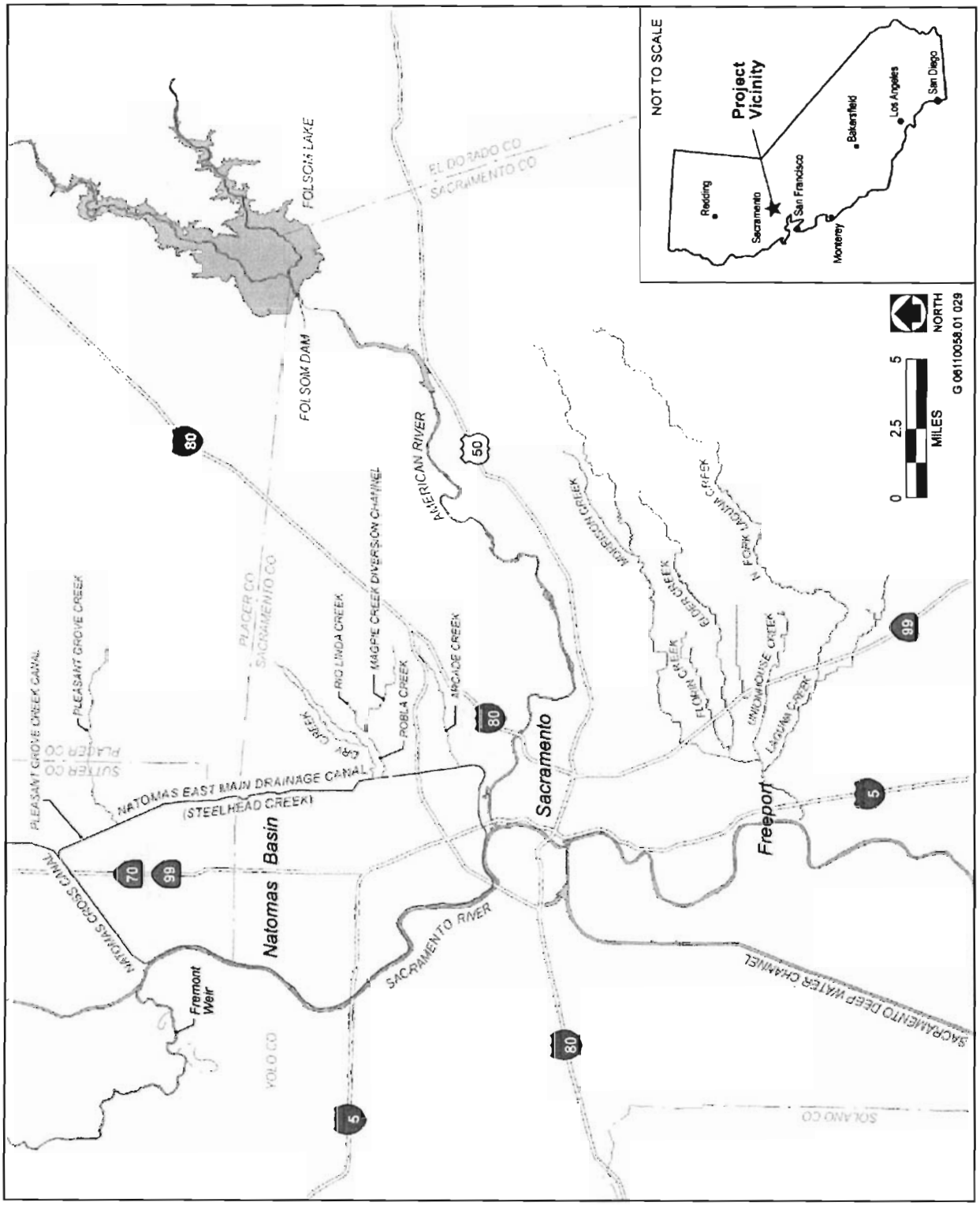
Action Item(s):

Distribution:

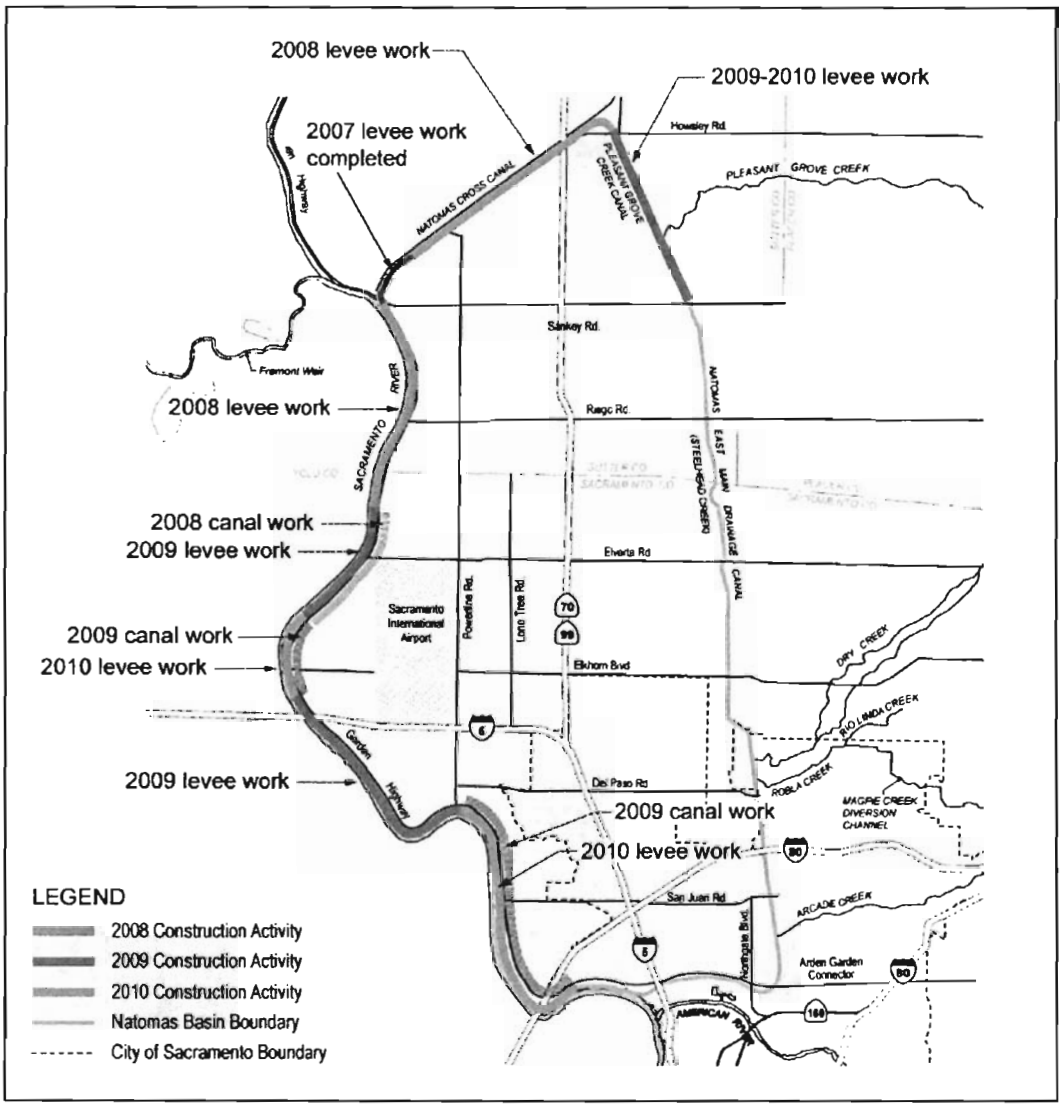
This phone note may contain confidential and proprietary information. It is intended for use by EDAW, Inc., its clients, vendors, and other associates.

ENCLOSURE 4

PROGRAMMATIC AGREEMENT
NATOMAS LEVEE IMPROVEMENT PROJECT



Enclosure 1: Project Location



Enclosure 2: Project Construction by Phase

ENCLOSURE 3

PROJECT SUMMARY

ENCLOSURE 3

DESCRIPTION OF THE SACRAMENTO AREA FLOOD CONTROL AGENCY'S NATOMAS LEVEE IMPROVEMENT PROGRAM LANDSIDE IMPROVEMENTS PROJECT

PURPOSE AND NEED

PROJECT OVERVIEW

The Natomas Levee Improvement Program (NLIP) Landside Improvements Project proposed by the Sacramento Area Flood Control Agency (SAFCA) is intended to provide urgently needed flood control system improvements to the Natomas Basin in southern Sutter and northern Sacramento Counties, California (Exhibit 1). The project would improve the levee system that protects the 53,000-acre Natomas Basin, including a portion of the city of Sacramento. The Natomas Basin is bounded by leveed reaches of the Natomas Cross Canal (NCC) on the north, the Sacramento River on the west, the American River on the south, and the Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal (NEMDC)/Steelhead Creek on the east (Exhibit 1).

SAFCA's intent is to provide the Natomas Basin with at least a 100-year level of flood protection by the end of 2010 and a "200-year" level of protection by the end of 2012. Achievement of these aims would significantly reduce the risk of an uncontrolled flood in the Natomas Basin that would result in a catastrophic loss of property (estimated at $7 billion) and a prolonged interruption of commercial activity, including the operation of Sacramento International Airport (Airport) and closure of Interstate 5 (I-5) and State Route (SR) 99/70. Flooding is particularly hazardous in a heavily urbanized basin like Natomas because of the depths that floodwaters can reach—more than 10 feet in some areas.

DEFICIENCIES OF THE NATOMAS LEVEE SYSTEM AND PROPOSED REMEDIES

Approximately 26 miles of the NCC south levee, the Sacramento River east levee, and the PGCC west levee require one or more forms of remediation to address the potential for failure in a 100-year or "200-year" flood event, as follows:

- Inadequate freeboard—The NCC south levee and portions of the Sacramento River east levee must be raised to provide at least 3 feet of freeboard above the 100-year water surface elevation, and several reaches of the Sacramento River east levee must be raised to provide 3 feet of freeboard above the "200-year" design water surface elevation.

- Underseepage and through-seepage vulnerability—Most of these same reaches do not meet recently adopted federal criteria for safely containing underseepage and through-seepage when the water surface in the adjacent channel reaches the 100-year elevation or, in some cases, the "200-year" elevation.

Underseepage problems can occur where levees are constructed on low-permeability foundation soil (silt and clay) underlain by a layer of higher permeability (sand and gravel). Excessive underseepage makes the levee 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 a "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 on 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.

The project encompasses addressing freeboard deficiencies through levee raises; addressing seepage potential using a combination of seepage berms, cutoff walls, and relief wells; and acquiring additional right-of-way to construct the improvements and to prevent encroachment into the flood control system. In addition, the project has been designed to include an enlarged levee embankment (adjacent setback levee) along the land side of the existing Sacramento River east levee to preclude the need for substantial removal of vegetation and structural encroachments on the water side of this levee in compliance with U.S. Army Corps of Engineers (Corps) guidance. These improvements would include recontouring the levee slopes where necessary.

The following subsections summarize the methods to address freeboard deficiencies and seepage potential, which will be used in various combinations on the NCC south levee, Sacramento River east levee, and the PGCC west levee.

Levee Raises

The freeboard increases would be accomplished through raises of the existing NCC south levee or through construction of the raised adjacent setback levee adjacent to the existing Sacramento River east levee:

- Raise of existing levee (NCC south levee). A full levee raise is required for the NCC south levee, consisting of an embankment raise from the landside or waterside toe (or both) upward to the increased levee crown elevation. This requires partially excavating the levee slope to provide a working platform for equipment, typically 10 feet wide, and rebuilding the levee to the appropriate elevation by benching the new embankment material into the existing embankment material.

- Adjacent setback levee (Sacramento River east levee). The levee raise of the Sacramento River east levee would be accomplished through the construction of an "adjacent setback levee" adjoining the Sacramento River east levee. The adjacent setback levee would be constructed with a crown elevation 3 feet above the "200-year" water surface profile. In the upper reaches, where the existing levee has freeboard deficiencies of as much as 3 feet, the crown of the adjacent setback levee would be higher than the existing levee and Garden Highway roadway. In the lower reaches, where the existing levee has sufficient freeboard, the adjacent setback levee would be the same height as the existing levee.

Seepage Berms

Seepage berms are wide embankments placed outward from the landside toe of the levee to lengthen the underseepage path, thereby lowering, to acceptable levels, the erosive potential of seepage passing through permeable layers under the levees. Seepage berms typically extend 100 to 400 feet from the levee. The berm thickness depends on the severity of the seepage pressure, but generally berms are 5 feet thick near the landside toe and taper to a thickness of 3 feet at the prescribed distance from the toe. A seepage collection ditch is often constructed at the landward toe of all seepage berms. Seepage berms are planned for construction along portions of the Sacramento River east levee and the PGCC west levee.

Cutoff Walls

Conventional slurry cutoff walls are typically constructed using an excavator with a long-stick boom capable of digging a trench to the maximum required depth. Bentonite slurry is pumped into the trench during trench excavation to prevent caving. The soil, cement, and bentonite are mixed to achieve the required cutoff wall strength and permeability, and the mixture is backfilled into the trench. Select fill is used to rebuild the levee. The NLIP includes construction of cutoff walls along portions of the NCC south levee and the Sacramento east levee. Cutoff wall construction may also be required in some areas along the PGCC west levee.

For the NCC south levee, preparation for construction of the cutoff wall would begin with using scrapers (or other suitable equipment, depending on the slope) to clear and grub/strip the surface to a depth of 2 inches to remove low-growing vegetation, loose stone, and surface soils. The aggregate base from the operating road also would be removed and stockpiled for later reuse. Waste material would be hauled to an off-site location.

Construction of the cutoff wall would include degrading the existing levee to a depth equal to one-half its total height (approximately 9 feet). A 70-foot-deep cutoff wall would be constructed for the total length of 23,150 lineal feet, with the method of installation at the contractor's discretion. Material degraded to support cutoff wall construction would be compacted at the landside toe of the levee to support raising portions of the NCC south levee. Unsuitable material generated from cutoff wall construction would be disposed of off-site. Equipment that would be used in phases of the cutoff wall construction includes excavators, scrapers, loaders, bulldozers, rollers, haul trucks, water trucks, hydroseeding trucks, pickup trucks, slurry pumps, and generators.

Work on the Sacramento River east levee includes construction of an adjacent levee with construction of a cutoff wall to occur in several reaches of the adjacent levee. Borrow material would be excavated from several locations in the project area and would be delivered to the levee construction sites by scrapers or haul trucks where it would be spread by motor graders and compacted by sheepsfoot rollers to build the adjacent levee up to a height equal to about two-thirds of the height of the existing levee. This would create a working platform for cutoff wall installation using an excavator with a long-stick boom capable of digging a trench to a maximum depth of approximately 80 feet. Bentonite slurry would be pumped into the trench during excavation to prevent caving. The soil excavated from the trench would be mixed with bentonite and backfilled into the trench to create the cutoff wall.

RELIEF WELLS

Relief wells provide protection against levee underseepage by providing a path for underseepage to exit to the ground surface at the landside toe of the levee without creating sand boils or piping levee foundation materials. Relief wells are an option for addressing underseepage in reaches where continuous sand and gravel layers have been identified by the geotechnical analysis.

Relief wells are constructed near the levee landside toe to provide pressure relief beneath surficial fine-grained soils. The wells are constructed using soil boring equipment to bore a hole vertically through the fine-grained blanket layer and into the coarse-grained aquifer layer beneath. Pipe casings and filters are installed to allow the pressurized water to flow to the ground surface, thereby relieving the pressures beneath the clay blanket. Relief wells either may discharge onto open ground or may require conveyance to a stormwater drainage system or a pump station. Relief wells cause the least amount of construction disturbance but require routine maintenance of the wells themselves and the drainage and pumping facilities necessary to support them.

EXISTING PROJECT FACILITIES AND POTENTIAL BORROW SITES

All project construction activities would take place within the Natomas Basin, except for the development of a borrow site on Reclamation District (RD) 1001 land northeast of the basin (Exhibit 2). The following sections describe the existing flood control facilities, their general setting, and adjacent irrigation infrastructure and the potential borrow sources. These features, as well as the borrow locations, constitute the physical infrastructure and locations where the project may result in effects on historic properties.

FLOOD CONTROL AND IRRIGATION FACILITIES

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 raised water elevations that can affect the NCC levees. For engineering purposes, the levee is divided into seven reaches. Much of the south levee contains an existing stability berm with an internal drainage system. An approximately 80- to 100-foot maintenance access area extends along the land side of the levee through most of the NCC's length.

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 The Natomas Basin Conservancy (TNBC), lie south of the NCC south levee from the eastern end of Reach 2 through the western end of Reach 6. A drainage canal, referred to as the Vestal Drain, runs parallel to the NCC south levee through much of Reach 2, approximately 100 feet from the landside levee toe. A private irrigation pump and irrigation canal are located at the landside levee toe in Reach 1. Natomas Central Mutual Water Company's (NMWC's) Bennett Pumping Plant and RD 1000's Pumping Plant No. 4 are located in Reach 2, and the NMWC Northern Pumping Plant is located in Reach 3. NMWC's North Main Canal runs parallel to the levee through Reaches 4 and 5, approximately 100 feet from the landside levee toe.

SACRAMENTO RIVER EAST LEVEE

An 18-mile-long section of the east levee of the Sacramento River protects the west side of the Natomas Basin between the NCC and the American River. For planning purposes, the levee is divided into 20 reaches. The Garden Highway is located on top of the levee crown within all 20 reaches. A drained, 10-foot-wide stability berm is present on the landside slope of the levee between the NCC and Powerline Road (Reaches 1–12). Cutoff walls were previously constructed through the levee in Reaches 12–20.

The land uses along the levee vary from north to south. Along the land side, Reaches 1–13 are bordered mainly by private agricultural lands containing a few rural residences, Airport bufferlands, and two farmed TNBC parcels. Teal Bend Golf Club is west of the Airport, adjacent to the levee along Reach 6. The parcels bordering Reaches 14–18 contain more residences, several rural estates, and three TNBC parcels. The land side of Reaches 19 and 20 is bordered by residential subdivisions, a business park, and City parklands.

Several irrigation canals, pipelines, wells, and pump stations exist along the Sacramento River east levee. The Elkhorn Canal and the Riverside Canal are key agricultural irrigation canals in the NMWC system. The Elkhorn Canal runs parallel to the Sacramento River east levee from the North Drainage Canal in Reach 4B through Reach 8 and into the start of Reach 9 (1,250 feet south of Elkhorn Boulevard). The Riverside Canal extends from just north of Reach 13 to the middle of Reach 19. Several lateral canals connect to the Elkhorn and Riverside Canals. These canals have earthen embankments with side slopes that are nearly vertical, requiring regular maintenance. Both canals are supplied by pumping plants on the Sacramento River.

In addition to the NMWC irrigation systems, there are several landowner-operated systems along the levee. These facilities are located primarily in Reaches 1–4A and 9–12, in areas not currently served by the NMWC systems. The areas are serviced by either well pumps on the land side or river pumps, which discharge into buried pipelines, small irrigation ditches, or directly onto fields. The distribution systems run along the landside toe of the levee to supply fields that slope away from the levee.

Several drainage pumping plants are operated by RD 1000 along the Sacramento River east levee. These facilities pump drain water from the main drainage canal system into the river. They include Pumping Plant No. 2, located in Reach 4B; Pumping Plant No. 5, located in Reach 10; Pumping Plant No. 3, located in Reach 13; and Pumping Plant No. 1, located in Reach 20A. Pumping Plant No. 2 was temporarily removed as part of an emergency levee repair in 2006 and would be replaced as an element of the project in 2009–2010. In addition to these RD 1000 pumping stations, the City of Sacramento operates the Willow Creek drainage pumping station which is located in Reach 19B.

PLEASANT GROVE CREEK CANAL WEST LEVEE

The PGCC west levee extends southerly from the east end of the NCC south levee to the north end of the NEMDC/Steelhead Creek levee near the Sankey Road crossing. The PGCC west levee protects the Natomas Basin from flood flows from Pleasant Grove Creek and other creeks in western Placer County, as well as from water that backs up in the NCC during high river stages in the Sacramento River. Natomas Road is located on top of the levee crown. No berms support this levee. A private canal extends parallel to the PGCC west levee for about 1,500 feet at the landside levee toe. Farms and scattered rural residences are located on the land side of the PGCC west levee, and a manufacturing facility and a railroad siding are located within several hundred feet of the levee, just south of Sankey Road.

BORROW SITES

Borrow sites are areas from which earthen materials would be removed for use in construction. The sites would be recontoured and developed as either managed marsh or grassland habitat following excavation for this use. Where borrow sites would be used over more than one construction season, the work would progress in cells that would be incrementally developed as habitat as the borrow activities are completed.

SAFCA has identified borrow sources for the project in 2008, 2009, and 2010 flood control and irrigation infrastructure improvements and redundant sources that may be pursued if negotiations regarding the preferred sources are unsuccessful or additional quantities are found to be needed during construction:

- Brookfield property (2008 preferred, 2009 preferred, 2010 preferred)
- Airport bufferlands north of the Airport complex (2008 preferred, 2009 preferred, 2010 potential)
- Fisherman's Lake area (2010 preferred) (no specific parcels identified for this borrow site)
- RD 1001 (2008 potential, 2009–2010 potential)

Except for the Fisherman's Lake area in the southern part of the Natomas Basin, these borrow areas are shown in Exhibit 3.

DESCRIPTION OF PROJECT ELEMENTS AND ACTIVITIES

The elements of the project are described in this section in four broad, overlapping categories:

- levee raising and seepage remediation,
- improvements to major irrigation and drainage infrastructure,
- habitat development and management, and
- additional actions to meet Federal Emergency Management Agency (FEMA) requirements: encroachment management and bridge crossing modifications.

Expanding the landside footprint of the Sacramento River east levee necessitates redesigning and relocating the irrigation and drainage infrastructure currently located along the landside toe of the levee. Relocation of other major and minor irrigation and drainage canals located near the NCC south levee and the PGCC west levee will be necessary with implementation of levee improvements. Modifications to the existing irrigation and drainage systems will include creation of a new canal designed to provide giant garter snake (GGS) habitat and improved stormwater drainage west of the Airport (GGS/Drainage Canal).

Site preparation would entail removing trees and other large vegetation from the construction area and stripping the top 6 inches of material from the landside slope of the existing levee, the footprint of the adjacent setback levee, the seepage berm areas, and the 50-foot-wide permanent maintenance access corridor. Large roots and

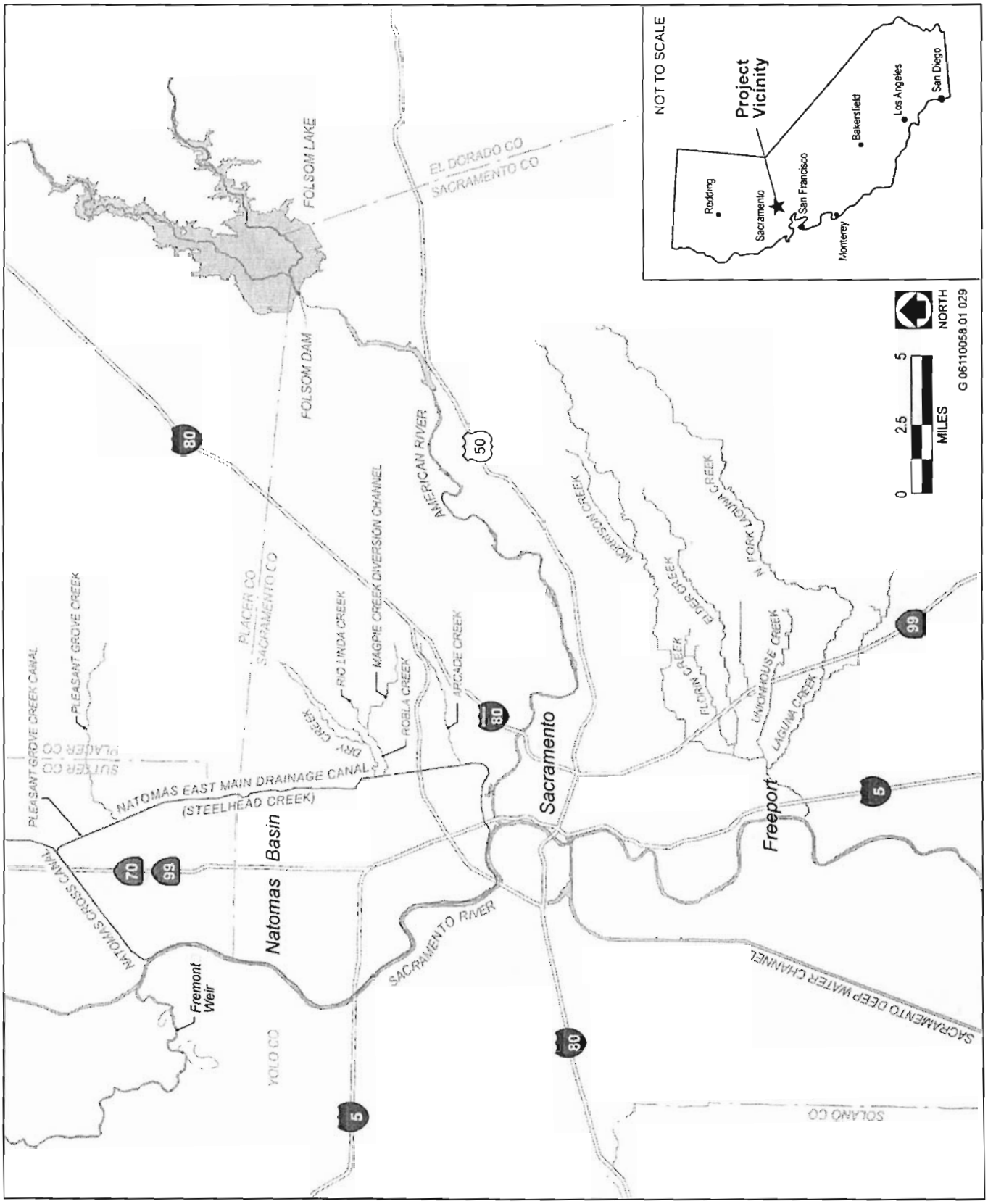
deleterious material would then be grubbed from the working area. To the extent feasible, trees that must be removed from within the footprint of the adjacent setback levee or berms would be relocated outside of the footprint to new woodland planting areas, where a substantial number of new trees would also be planted. Excess earth materials (organic soils, roots, and grass from borrow areas and the adjacent levee foundation and excavated material that does not meet levee embankment criteria) would be used in the reclamation of borrow areas or hauled off-site to landfills. Cleared vegetation (i.e., trees, brush) would be hauled off-site to landfills. After construction, the levee slopes and any previously vegetated areas disturbed during construction, including staging areas, would be seeded with a grass mix.

The major project elements and related activities are summarized in Table 1.

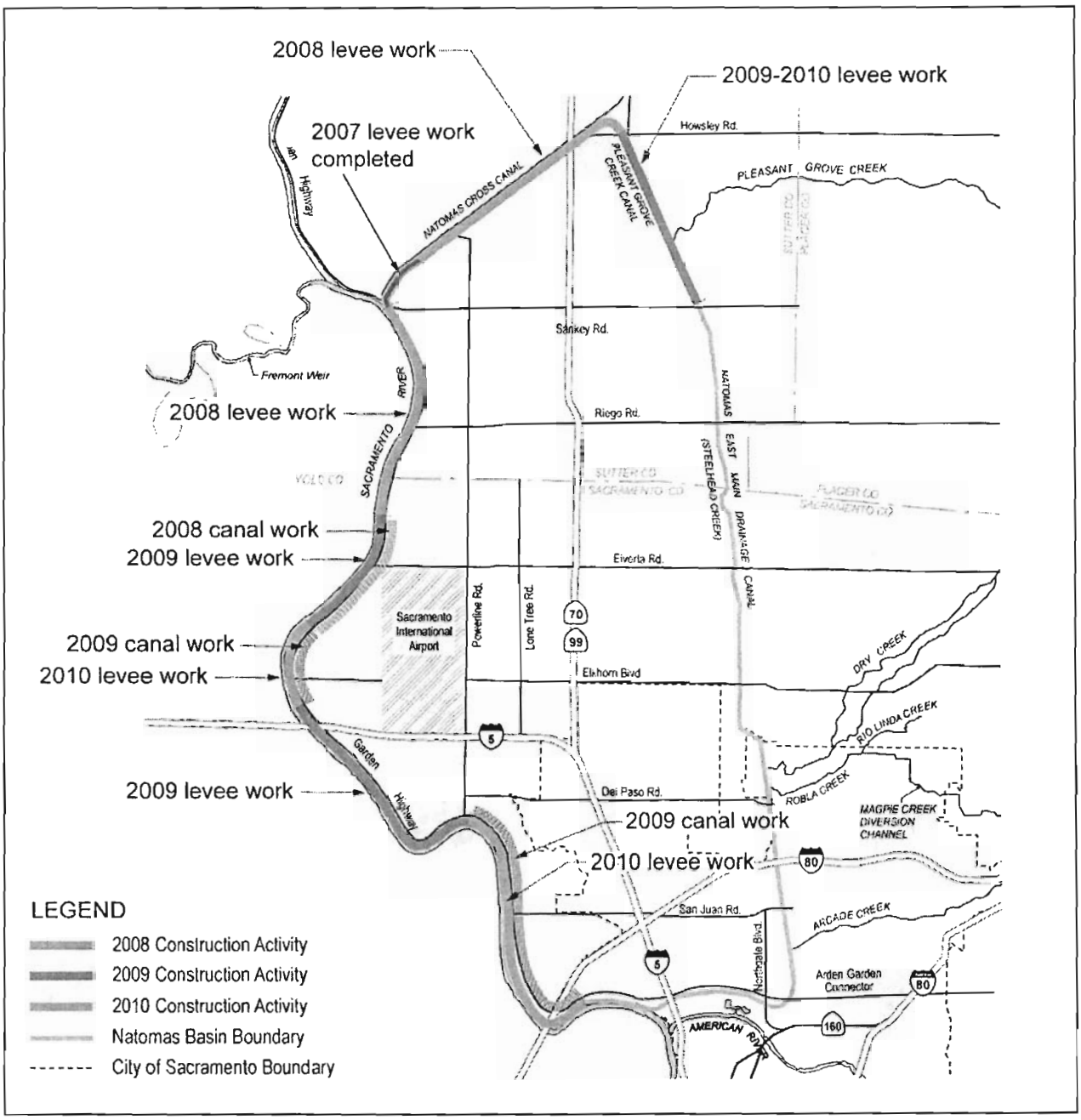
Table 1
Summary of the Major Elements of the Project

Project Element	Project Activity and Timing
2008 Construction	
Levee raising and seepage remediation: NCC south levee	Raise and realign the NCC south levee to provide additional freeboard and more stable waterside and landside slopes and to reduce the need for removal of waterside vegetation. (May 8–November 1, 2008) Construct a seepage cutoff wall through the levee crown in Reaches 3–7. (May 8–October 15, 2008)
Levee raising and seepage remediation: Sacramento River east levee (adjacent setback levee)	Construct a raised adjacent setback levee from the NCC to just south of the North Drainage Canal (Reaches 1–4B, except Stations 55+00 to 68+00 in Reach 2) with a 100-foot seepage berm in Reach 4A and a 300-foot seepage berm in Reach 4B. (May 1–November 1, 2008)
Improvements to major irrigation and drainage infrastructure	Construct a new canal designed to provide drainage and associated giant garter snake habitat (the GGS/Drainage Canal) between the North Drainage Canal and Elkhorn Reservoir. (May 1–November 1, 2008) Relocate the Elkhorn Canal (highline irrigation canal) between the North Drainage Canal and Elkhorn Reservoir in anticipation of the filling of the existing Elkhorn Canal at the toe of the Sacramento River east levee in late 2008 and in 2009. (May 1–November 1, 2008) Remove a deep culvert at the location of Pumping Plant No. 2. (May 1–November 1, 2008)
Habitat creation and management	Establish vegetative habitat features in the new GGS/Drainage Canal. (Fall 2008) Recontour and create managed marsh and grassland on lands used as borrow sources. (Fall 2008 or spring 2009) Establish grassland on the adjacent setback levee slopes and seepage berms. (August 1–December 31, 2008) Install woodland plantings to offset the loss of portions of tree groves in the landside levee footprint. (Fall 2008)
Right-of-way acquisition	Acquire right-of-way through fee title or easement interest within the footprint of the project features, at the borrow sites and along the flood control system. (Before construction)
2009–2010 Construction	
Levee raising and seepage remediation: Sacramento River east levee (adjacent setback levee)	Construct an adjacent setback levee along Stations 55+00 to 68+00 in Reach 2 and from just south of the North Drainage Canal to the American River north levee (Reaches 5A–20B), raised where needed to provide adequate freeboard, with seepage berms, relief wells, and cutoff walls for seepage remediation as required (specific seepage remediation measures are still under study). (May 1–November 1, 2009, and May 1–November 1, 2010)
Seepage remediation: PGCC west	Flatten waterside and landside slopes, and construct seepage berms along the PGCC west levee (specific berm widths and potential use of cutoff walls in some areas to be

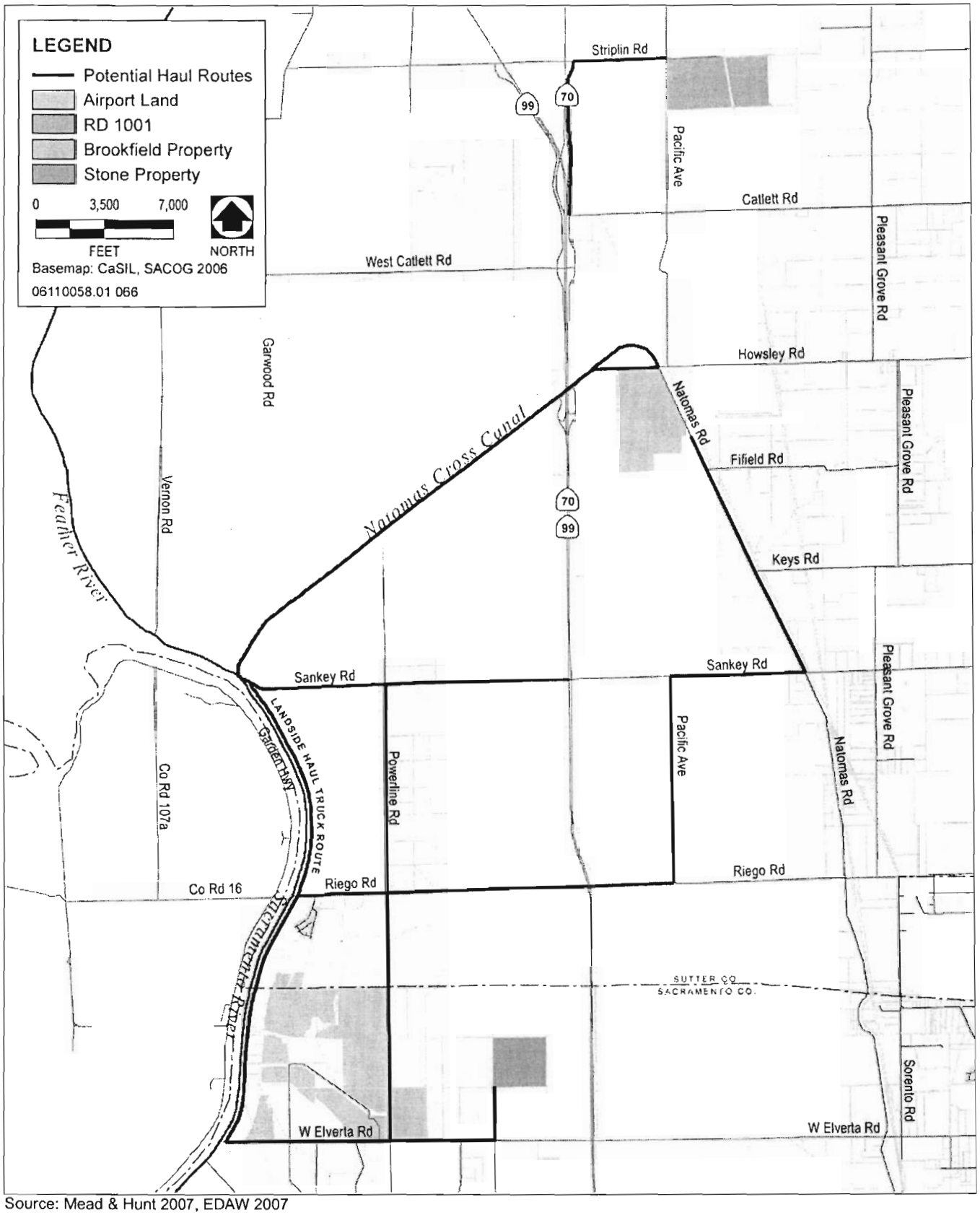
Table 1 Summary of the Major Elements of the Project	
Project Element	**Project Activity and Timing**
levee	determined). (May 1–November 1, 2010)
Improvements to major irrigation and drainage infrastructure	Construct the new GGS/Drainage Canal between Elkhorn Reservoir and the West Drainage Canal (specific alignment to be determined), and improve the West Drainage Canal to provide enhanced giant garter snake habitat. (May 1–November 1, 2009) Implement Airport West Ditch improvements in connection with construction of the GGS/Drainage Canal to allow the Airport to decommission the agricultural irrigation function of this facility and eliminate the hazards currently associated with it. The Airport stormwater detention function provided by this ditch would continue. The ditch would therefore be recontoured as a gently sloping swale to facilitate periodic maintenance such as mowing. (May 1–November 1, 2009) Relocate the Riverside Canal and the Elkhorn Canal downstream of Elkhorn Reservoir (specific alignments to be determined) and fill the existing canals. (May 1–November 1, 2009) Construct RD 1000 Pumping Plant No. 2. (April 1, 2009–September 1, 2010)
Habitat creation and management	Establish habitat enhancements in the new GGS/Drainage Canal and improved West Drainage Canal. (Fall 2009) Recontour and create marsh and managed grassland on lands used as borrow sources. (Fall or spring after borrow excavation in 2009 and 2010) Establish grassland on the adjacent setback levee slopes and seepage berms. (Fall after construction in 2009 and 2010) Install woodland plantings to offset the loss of portions of tree groves in the landside levee footprint (locations to be determined). (Fall 2009 and 2010)
Additional actions to meet FEMA requirements: encroachment management on the Sacramento River east levee, and bridge crossing modifications at the NCC	Remove encroachments from a portion of the water side and land side of the Sacramento River east levee as needed to ensure that the levee can be certified as meeting the minimum requirements of the NFIP and USACE design criteria (specific criteria still under discussion). (Timing to be determined) Modify the SR 99/70 crossing of the NCC as needed to meet FEMA requirements. (Timing to be determined)
Right-of-way acquisition	Acquire right-of-way through fee title or easement interest within the footprint of the project features, at the borrow sites and along the flood control system. (Before construction)
Notes: Airport = Sacramento International Airport; Elkhorn Canal = Elkhorn Main Irrigation Canal; FEMA = Federal Emergency Management Agency; GGS = Giant Garter Snake; NCC = Natomas Cross Canal; NFIP = National Flood Insurance Program; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; Riverside Canal = Riverside Main Irrigation Canal; SR = State Route; USACE = U.S. Army Corps of Engineers	



Project Location **Exhibit 1**



Project Construction By Phase **Exhibit 2**



Source: Mead & Hunt 2007, EDAW 2007

Anticipated Borrow Areas and Local Haul Routes **Exhibit 3**

ENCLOSURE 4

PROGRAMMATIC AGREEMENT
NATOMAS LEVEE IMPROVEMENT PROJECT

PROGRAMMATIC AGREEMENT
AMONG THE U.S. ARMY CORPS OF ENGINEERS,
THE SACRAMENTO AREA FLOOD CONTROL AGENCY, AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

REGARDING THE ISSUANCE OF PERMISSION UNDER THE AUTHORITY OF SECTION 408 OF THE RIVERS AND HARBORS ACT OF 1899 AND SECTION 404 OF THE CLEAN WATER ACT FOR THE NATOMAS LEVEE IMPROVEMENT PROGRAM, LANDSIDE IMPROVEMENTS PROJECT

WHEREAS, the U.S. Army Corps of Engineers, Sacramento District (Corps) proposes to review an application that seeks permission for alteration of flood control structures under the authority of Section 408 of the Rivers and Harbors Act and to issue one or more permits to discharge fill to the waters of the United States under the authority of Section 404 of the Clean Water Act to the Sacramento Area Flood Control Agency (SAFCA) for the Natomas Levee Improvement Program Landside Improvements Project (Project); and

WHEREAS, The Corps has determined that the issuance of these permissions and permits constitute an undertaking per 36 CFR 800.16(y), which require compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended (16 U.S.C. 470f); and

WHEREAS the Project includes improvements to an extensive levee system surrounding the Natomas Basin and landscape and irrigation/drainage infrastructure modifications that will be implemented in three construction phases, currently scheduled for 2008, 2009, and 2010; and

WHEREAS, the Corps has determined that this undertaking will have an adverse effect on at least one Historic Property that has been determined eligible for inclusion in the National Register of Historic Places (NRHP), CA-SAC-485/H; and

WHEREAS, because of the complex and phased nature of the improvements, the Corps has not yet determined the exact area of potential effects (APE), nor has SAFCA acquired all of the rights-of-entry, easements and ownership interests that would allow a complete inventory and determination of effects on Historic Properties; and

WHEREAS, the Natomas Basin is sensitive for buried archaeological resources that cannot be accurately located prior to construction; and such buried sites may also be Historic Properties, and therefore SAFCA and the Corps need to document a framework for managing post-review discoveries per 36 CFR Section 800.13, including evaluation of those resources, assessment of effects, and resolution of potential adverse effects; and

WHEREAS, at such time as any unevaluated cultural resource may be discovered, it may require archaeological data recovery and/or other historic preservation activities, in compliance with Section 106 of the National Historic Preservation Act, concurrent with *active* construction; and

WHEREAS, the urgency of flood control improvements require a management framework for Historic Properties that will be implemented after the execution of this agreement in an expedited manner that thus departs from the process normally used under 36 CFR Section 800 et seq., yet still fulfills the requirements of Section 106 of the NHPA; and

WHEREAS, SAFCA has been invited to participate as a signatory to this Programmatic Agreement (PA) by the Corps and the California State Historic Preservation Officer (SHPO; and

WHEREAS, the Corps has consulted The Ione Band of Miwok Indians, the Shingle Springs Band of Miwok Indians and the United Auburn Indian Community, and they have been invited to concur in this PA; and

WHEREAS, the Corps shall make the terms and conditions of this PA as part of the conditions of any permissions and permits issued by the Corps for this project; and

WHEREAS, The Central Valley Flood Protection Board has delegated all authority for SAFCA to comply with the terms of this agreement on its behalf; and

WHEREAS, the Corps has consulted with the SHPO and the Council in accordance with regulations implementing Section 106 of the NHPA;

WHEREAS, the Council has been consulted and declined to participate in this agreement;

NOW, THEREFORE, the Corps, the SHPO, and SAFCA agree that the Project shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on Historic Properties.

The Corps shall ensure that the following stipulations of this PA are carried out.

STIPULATIONS

I. DEFINITIONS

The terms used in this Programmatic Agreement shall be as defined in regulations implementing Section 106 of the NHPA, and as follows:

"APE (Area of Potential Effect)" means any location at which any Project development activity will be constructed; and locations of any Project-related construction staging areas, borrow areas, and materials stockpile areas; and the locations of any other Project development activities. The APE shall be defined so as to include the maximum spatial dimensions of all Project-related construction and operations rights-of-way, easements, areas which potentially may be affected by Project activities, and other properties to which SAFCA has access, whether on a temporary or permanent basis, or ownership for Project development.

"**Concurring parties**" means their concurrence indicates that they are in agreement with the terms of the PA.

"Consulting parties" means the Corps, the SHPO, and SAFCA who are signatories to this PA. Only signatories have the authority to amend or terminate this PA.

"**Cultural resources**" means any property or location that was created, modified, or used by people at least 50 years in the past. Cultural resources include but are not limited to Historic Properties and traditional cultural properties/places (i.e., NRHP listed or eligible properties as defined at 36 CFR Part 60).

"Historic Property" means a cultural resource that has been determined eligible for or is listed on the NRHP (i.e., NRHP listed or eligible properties as defined at 36 CFR Part 60), either by formal nomination and listing or by concurrence between federal agencies and the SHPO.

"Historic preservation" means any activity conducted in accordance with the NHPA and its implementing regulations to, among other things, inventory, evaluate, manage, or treat cultural resources such as buildings, structures, sites, districts, and objects eligible for, or that may be determined eligible for, listing in the NRHP according to eligibility criteria at 36 CFR Part 60.

"Project development activities" means any physical action related to the Project that has the potential to damage or otherwise alter those characteristics of Historic Properties that would make them eligible for listing in the NRHP.

II. STANDARDS

(A.) Professional Qualifications. All technical work required for historic preservation activities implemented pursuant to this Programmatic Agreement shall be carried out by or under the direct supervision of a person or persons meeting at a minimum the *Secretary of Interior's Professional Qualifications Standards* for archaeology or history, as appropriate (48 FR 44739). "Technical work" here means all efforts to inventory, evaluate, and perform subsequent treatment such as data recovery excavation or recordation that is required under this Programmatic Agreement. This stipulation shall not be construed to limit peer review, guidance, or editing of documents by SAFCA or SAFCA's consultants.

(B.) Historic Preservation Standards. Historic preservation activities carried out pursuant to this Programmatic Agreement shall meet the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44740) as well as standards and guidelines for historic preservation activities established by the SHPO. The Corps shall ensure that all reports prepared pursuant to this Programmatic Agreement will be provided to the consulting parties and shall ensure that all such reports meet published standards of the California Office of Historic Preservation, specifically, *Preservation Planning Bulletin* Number 4(a), "Archaeological Resources Management Reports (ARMR): Recommended Contents and Format" (December 1989).

III. PROJECT DESCRIPTION

(A) PROJECT Description. A description of the Project is found in the Final Environmental Impact Report (November 2007). A summary of the Project's description in the environmental impact report is provided as **Attachment A** and is made a part of this Programmatic Agreement.

(B) Existing Conditions. An archival search and archaeological survey have been completed for all areas of the APE as currently defined to which SAFCA currently has access, and which currently are not covered by paving, built environment features, or agricultural crops. A report of the results of archival research and archaeological survey, "Cultural Resources Inventory Reports, Part 1 – Natomas Levee Improvement Program Landside Improvements Project, Sacramento and Sutter Counties, California" (October 2007) is made **Attachment B** to this Programmatic Agreement.

A number of prehistoric sites are known to be present along the banks of the Sacramento River. However, archaeological survey of the area is of limited value because the alluvial depositional environment may

obscure and bury sites, leaving no surface manifestation of those archaeological resources. For most of the length of the Project, levees have been built on the riverbanks. These levees are one focus of the Project's activity, and occupy a substantial portion of the Project's APE. Furthermore, it has not been established whether certain known sites in proximity to the Project's development activities extend under the existing levees. The existing levees both obscure ground surfaces and prevent subsurface archaeological testing within their footprints. Because of these conditions, a full assessment of archaeological sites that may be present in the APE cannot be made in advance of construction. There is no definitive information, even for sites known to be in Project's proximity, of site boundaries relative to the APE, or of the significance or integrity of any portions of such sites that may be within the APE. For these reasons, even though archaeological deposits may extend into the APE, and even though some of these deposits may qualify as Historic Properties, it is impossible to develop meaningful site-specific Historic Properties Treatment Plans (HPTP) prior to all construction, or to carry out all necessary data recovery in advance of the Corps' approvals, permitting and construction.

For these reasons, unforeseen discoveries shall be treated pursuant to the provisions of 36 CFR 800.13 (Post-review discoveries).

(C) Project Phasing and Potential Changes to the APE: Because the improvements will occur in three phases (anticipated to be 2008, 2009, and 2010), it will be necessary to define the APE for each phase. The APE for each phase shall be submitted with the cultural resources inventory reports, and shall be consulted upon as part of that document, pursuant to **Stipulation IV**, below.

After the initial concurrence, changes to the APE may be necessary as SAFCA refines its phased Project plans. In particular, the ability of SAFCA to obtain access permissions of private landowners, determination of borrow sites and ongoing negotiations with resource agencies regarding species mitigation requirements may affect final Project's design, and may expand the current APE in some areas. Any changes to the APE shall be made in accordance with subsections D and E (below) of this Stipulation III. The SHPO, Corps, and SAFCA shall consult and reach concurrence in any changes to the APE. The final APE shall account for all Project development activities for the as-built Project. SAFCA shall notify the Corps of any change in the APE and the Corps shall determine the potential for Project development activities in a revised APE to affect cultural resources, through cultural resources inventory and testing as needed.

(1) If there is the potential that cultural resources exist in the revised APE, SAFCA shall submit to the Corps:
   (a) a map of the revised APE; and
   (b) a description of Project development activities to take place in the revised APE; and
   (c) a description of the inventory, nature, location, and known or potential significance of cultural resources in the revised APE; and
   (d) a description of any archaeologically sensitive areas in the revised APE that require monitoring by an archaeologist, and Native American monitor as appropriate; and
   (e) a plan for managing cultural resources in a manner that either avoids Project-related effects to cultural resources, or which mitigates any adverse effects, and which provides for the management of unforeseen cultural resources discoveries.

(2) If no cultural resources are identified within a revised APE, SAFCA shall document such a determination, provide documentation to the Corps and keep such documentation on file at its

principal offices.

After the Corps and SAFCA agree to a revised APE and if such a change has the potential to have an effect on cultural resources, the Corps shall submit the documentation to the SHPO for their review The SHPO shall have 30 calendar days from the date of receipt of the notice of a revision to the APE to review and to provide in writing either concurrence with or objection to the definition of the revised APE, and any proposed historic preservation activities. Should the SHPO not respond in writing within 30 calendar days, the Corps and SAFCA shall proceed as though the SHPO has concurred in the revised APE, and the proposed historic preservation activities, if any.

Should the SHPO object to the definition of the revised APE or proposed historic preservation activities, the Corps, SAFCA, and the SHPO shall consult for a period not to exceed 15 calendar days following the date of the receipt of the SHPO's written objection in an effort to come to agreement on the issues to which the SHPO has objected. Should the SHPO, the Corps, and SAFCA be unable to agree on the issues to which the SHPO has objected, the consulting parties to this Programmatic Agreement shall proceed in accordance with **Stipulation VIII (Resolving Objections)**, below.

(D) Scope of Identification Efforts in the APE: Inventories of Historic Properties within the established or revised APE shall be completed in accordance with **Stipulation IV (Inventory of Historic Properties)** of this Programmatic Agreement. Treatment of any adverse effects to Historic Properties within the established or revised APE shall be completed in accordance with **Stipulation V (Treatment of Effects)** of this Programmatic Agreement.

(E) Scope of the APE: For purposes of this Programmatic Agreement, a revised APE shall be defined to meet, at a minimum, the following criteria:

(1) The APE for any segment of the Natomas levees that are being improved as part of the Project and shall include the levee segment and a corridor extending not less than 75 feet from the land side toe of the levee segment. The APE also shall include:

- The extent of all Project construction and excavation activity required to construct flood control facilities and to modify irrigation and drainage infrastructure,
- The additional right-of-way/easements obtained by SAFCA as part of the Project's features,
- All areas used for excavation of borrow material and habitat creation, and
- All construction staging areas.

(2) The APE for Project activities shall include the direct footprint of the activity and a reasonable buffer determined by consultation between SAFCA and the Corps, according to the nature of the activity, SAFCA's ownership interest or easement, and the probability that ground-disturbing work may extend beyond the footprint of planned improvements and activities.

(3) The APE for any other type of Project development activities shall be defined by the Corps in consultation with the consulting parties.

IV. INVENTORY OF HISTORIC PROPERTIES

(A) Identification Efforts to Date and Further Work Required: An inventory of Historic Properties

within the APE has been initiated consistent with the *Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716–44740). The SAFCA shall submit a completed inventory and evaluation for each phase of Project work (2008, 2009, 2010) to the Corps. Such inventory shall be deemed complete by the Corps when the SHPO concurs in the NRHP eligibility recommendation for all cultural resources within the APE for that phase.

Areas of Archaeological Sensitivity: Areas of archaeological sensitivity will be monitored in accordance with HPTPs.

(C) Changes in the APE: If areas are added to the Project development activities subsequent to the SHPO concurrence on the map of the APE for a specific phase, SAFCA shall complete an inventory of Historic Properties within the expanded APE. Such inventory shall be undertaken and completed consistent with the *Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716–44740). Such inventory shall be deemed completed by the Corps at such time as the SHPO concurs in the NRHP eligibility of all cultural resources within the established and revised APE for the Project, pursuant to this Stipulation IV.

V. TREATMENT OF EFFECTS

(A) Historic Property Treatment Plans: If Historic Properties are identified in cultural resources inventories that would be adversely affected by the Project, SAFCA shall prepare a Historic Properties Treatment Plan (HPTP) for review and written approval by the Corps and the SHPO for those specific properties. An HPTP applicable to every Historic Property that may sustain adverse effects by the Project shall be prepared, including for those Historic Properties found during construction. An HPTP may address individual or multiple Historic Properties. An HPTP shall stipulate those actions SAFCA shall take to resolve the adverse effects of the Project on Historic Properties. SAFCA shall ensure that all provisions of an HPTP are carried out in a timely manner. Any changes to an HPTP shall be reviewed and approved by the Corps. Copies of all reports pertaining to the treatment of Historic Properties shall be submitted to the consulting parties to this Programmatic Agreement. Reports and other data pertaining to the inventory of, and treatment of effects on, Historic Properties may be distributed to concurring parties to this Programmatic Agreement and to other members of the public consistent with **Stipulation VII (Confidentiality)** of this Programmatic Agreement. Individual HPTPs may be submitted simultaneously with the cultural resources inventory report for specific Project phases. If HPTPs are submitted simultaneously with an inventory report for a Project phase or with an addendum to such report for an expanded APE or Project description, the Corps and SHPO review period for such HPTP shall run concurrently with the review period for the inventory report.

Review Schedule: The SHPO and the Corps shall have 30 calendar days to review and comment upon in writing any HPTP submitted by SAFCA. The SHPO and the Corps shall indicate in their review that they find the HPTP either acceptable or not. In the event that comments are not made by the SHPO within 30 calendar days, the Corps shall assume the SHPO has accepted the HPTP as submitted. In the event the Corps and/or the SHPO provide written comment within the 30-day period, either SAFCA shall accept the comments and revise the HPTP accordingly, or SAFCA and the Corps may object to some or all comments. Comments from the Corps or the SHPO that are not acceptable to SAFCA shall be resolved by consultation among the Corps, the SHPO, and SAFCA for a period of not more than 15 calendar days. Should the Corps, the SHPO, and SAFCA be unable to resolve any dispute regarding the Corps or the SHPO comments, the consulting parties shall proceed in accordance with **Stipulation VIII (Resolving**

Objections) of this Programmatic Agreement.

The Corps shall submit to the SHPO for review and comment any amendment, addendum, revision or other change to an HPTP. SAFCA shall proceed to make changes to an HPTP as per the procedure and schedule for the review and approval of an original HPTP. If a Historic Property is discovered within an expanded APE subsequent to an initial inventory effort for a phase, and the Corps and SAFCA agree that the Project may adversely affect the property, SAFCA shall submit an addendum to the HPTP or a new HPTP. The review schedule for this submittal follows the provisions of Stipulation V.

(B) Commencement of Construction and Project Work: Project development activities may commence within the APE after a Historic Properties inventory has been completed (per **Stipulations III and IV**, above), and prior to treatment of adverse effects on Historic Properties within the APE provided that:

(1) A plan to respond to inadvertent archaeological discoveries is prepared by SAFCA and approved by the Corps prior to the commencement of Project activities anywhere in the APE for that phase of the Project; and

(2) Project development activities do not encroach within 30 meters (100 ft) of the known boundaries of any Historic Property as determined from archaeological site record forms, other documentation, or as otherwise defined in consultation with the SHPO; and

(3) An archaeological monitor is present during any Project activities that are anticipated to extend either vertically or horizontally into any areas designated to be archaeologically sensitive by SAFCA in consultation with the Corps.

(C) Final Report Documenting Implementation of the Historic Properties Treatment Plan(s): Within one year after the completion of all work performed as part of the Project SAFCA shall submit to the Corps and SHPO a final report documenting the results of all work prepared under the HPTPs. This report shall be submitted to the Corps and SHPO for review and comments, which SAFCA shall incorporate.

VI. NATIVE AMERICAN AND OTHER PUBLIC CONSULTATION AND PUBLIC NOTICE

Members of the interested public shall be invited to consult regarding this Programmatic Agreement. Within 30 calendar days of the signing date of this Programmatic Agreement, the Corps, the SHPO, and SAFCA shall consult to compile a list of members of the interested public who shall be provided notice of this Programmatic Agreement. The opinions of local Native Americans with cultural ties to the APE and the opinions of other members of the public shall be taken into account by the consulting parties for historic preservation actions taken in accordance with this Programmatic Agreement. Native Americans and other members of the public may be invited to concur in this Programmatic Agreement. Native American monitor(s) shall be invited to assist SAFCA in the treatment of any Native American human remains and items associated with Native American burials discovered during the Project in accordance with California Public Resources Code Section 5097.98 and California Health and Safety Code Section 7050.5(b) and 7050.5(c).

VII. CONFIDENTIALITY

Confidentiality regarding the nature and location of the archaeological sites and any other cultural

resources discussed in this Programmatic Agreement shall be maintained on a "need-to know" basis limited to appropriate personnel and agents of SAFCA, the Corps, and the SHPO involved in planning, reviewing and implementing this Programmatic Agreement consistent with Section 304 of the NHPA.

VIII. RESOLVING OBJECTIONS

(A.) Should any party to this Programmatic Agreement object to any action proposed or carried out pursuant to this Programmatic Agreement, the Corps shall consult with the objecting party(ies) for a period of time not to exceed *30 calendar days* to resolve the objection. If the Corps determines that the objection cannot be resolved, the Corps shall forward all documentation relevant to the dispute to the Council. Within 30 calendar days after receipt of all pertinent documentation, the Council shall either:

(1) Provide the Corps with recommendations, which the Corps shall take into account in reaching a final decision regarding the objection; or

(2) Notify the Corps that the Council will comment in accordance with the requirements of Section 106 of the NHPA, and proceed to comment. Any Council comment provided in response shall be taken into account by the Corps, pursuant to the requirements of Section 106 of the NHPA.

(3) Should the Council not exercise one of the above options within 30 days after receipt of all pertinent documentation, the Corps may assume the Council's concurrence in its proposed response to the objection.

(4) The Corps shall take into account any Council recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection; the Corps' responsibility to carry out all actions under this Programmatic Agreement that are not the subjects of the objection shall remain unchanged.

(B.) At any time during implementation of the measures stipulated in this Programmatic Agreement should an objection pertaining to the Programmatic Agreement be raised by a member of the public, the Corps or SAFCA shall notify the consulting parties to the Programmatic Agreement and take the objection into account, consulting with the objector and, should the objector so request, with any of the consulting parties to this Programmatic Agreement to address the objection.

IX. AMENDMENTS

Any consulting party to this Programmatic Agreement may propose that the Programmatic Agreement be amended, whereupon the Corps shall consult with the other consulting parties to this Programmatic Agreement to consider such amendment. Any amendment shall be executed by the consulting parties in the same manner as the original Programmatic Agreement.

If the Project has not been completed within five years of the date of the execution of this Programmatic Agreement, the consulting parties shall consult on a date not less than 90 days prior to the fifth anniversary of this Programmatic Agreement to either amend this Programmatic Agreement and acknowledge its continued applicability for the undertaking for a designated period of time, or terminate this Programmatic Agreement and proceed to again consult regarding the undertaking in accordance with regulations implementing Section 106 of the NHPA.

All attachments to this Programmatic Agreement, and other instruments prepared pursuant to this agreement such as, but not limited to, the Project's description, initial cultural resource inventory report and maps of the APE, HPTPs, and monitoring and discovery plans may be amended without requiring amendment of this Programmatic Agreement. Such amendments will be consulted on by the concurring parties and shall be final when agreement is reached by the parties.

X. FAILURE TO CARRY OUT THE TERMS OF THE AGREEMENT

Should the Corps fail to ensure that the terms of this Programmatic Agreement are carried out, the Corps shall notify the parties to this Programmatic Agreement and again consult with the SHPO and the Council in accordance with regulations implementing Section 106 of the NHPA. The Corps shall not take any action or make any irreversible decision that would affect an Historic Property, preclude historic preservation alternatives, or foreclose any opportunities for the Council to comment on the undertaking prior to completion of the process for considering and resolving effects on Historic Properties provided in this document.

XI. SCOPE OF THE PROGRAMMATIC AGREEMENT

Execution of this Programmatic Agreement by the Corps, the SHPO, and SAFCA, and implementation of its terms, evidence that Corps has afforded the Council an opportunity to comment on the undertaking for SAFCA Natomas Levee Improvement Program Landside Improvements Project, pursuant to 16 U.S.C. 470f, and that the Corps has taken into account the effects of the undertaking on Historic Properties. This Programmatic Agreement is limited in scope to the undertaking defined herein and is entered into solely for that purpose.

CONSULTING PARTIES:

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT

By: _____ Date:
Title: COL Thomas Chapman, District Engineer, Sacramento District, U.S. Army Corps of Engineers

SACRAMENTO AREA FLOOD CONTROL AGENCY

By: _____ Date:
Title: Stein M. Buer, Executive Director, Sacramento Area Flood Control Agency

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date:
Title: Milford Wayne Donaldson, F.A.I.A., California State Historic Preservation Officer

CONCUR:

CENTRAL VALLEY FLOOD PROTECTION BOARD

By: _____ Date:

Title: Benjamin Carter, President, Central Valley Flood Protection Board

By: _____ Date:
Title:

Attachment A: Project Description Summary
Attachment B: "Cultural Resources Inventory Reports, Part 1 – Natomas Levee Improvement Program Landside Improvements Project, Sacramento and Sutter Counties, California" (report).

ATTACHMENT A

Project Description Summary

ATTACHMENT A

DESCRIPTION OF THE SACRAMENTO AREA FLOOD CONTROL AGENCY'S NATOMAS LEVEE IMPROVEMENT PROGRAM LANDSIDE IMPROVEMENTS PROJECT

PURPOSE AND NEED

PROJECT OVERVIEW

The Natomas Levee Improvement Program (NLIP) Landside Improvements Project proposed by the Sacramento Area Flood Control Agency (SAFCA) is intended to provide urgently needed flood control system improvements to the Natomas Basin in southern Sutter and northern Sacramento Counties, California (Exhibit 1). The project would improve the levee system that protects the 53,000-acre Natomas Basin, including a portion of the city of Sacramento. The Natomas Basin is bounded by leveed reaches of the Natomas Cross Canal (NCC) on the north, the Sacramento River on the west, the American River on the south, and the Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal (NEMDC)/Steelhead Creek on the east (Exhibit 1).

SAFCA's intent is to provide the Natomas Basin with at least a 100-year level of flood protection by the end of 2010 and a "200-year" level of protection by the end of 2012. Achievement of these aims would significantly reduce the risk of an uncontrolled flood in the Natomas Basin that would result in a catastrophic loss of property (estimated at $7 billion) and a prolonged interruption of commercial activity, including the operation of Sacramento International Airport (Airport) and closure of Interstate 5 (I-5) and State Route (SR) 99/70. Flooding is particularly hazardous in a heavily urbanized basin like Natomas because of the depths that floodwaters can reach—more than 10 feet in some areas.

DEFICIENCIES OF THE NATOMAS LEVEE SYSTEM AND PROPOSED REMEDIES

Approximately 26 miles of the NCC south levee, the Sacramento River east levee, and the PGCC west levee require one or more forms of remediation to address the potential for failure in a 100-year or "200-year" flood event, as follows:

- Inadequate freeboard—The NCC south levee and portions of the Sacramento River east levee must be raised to provide at least 3 feet of freeboard above the 100-year water surface elevation, and several reaches of the Sacramento River east levee must be raised to provide 3 feet of freeboard above the "200-year" design water surface elevation.

- Underseepage and through-seepage vulnerability—Most of these same reaches do not meet recently adopted federal criteria for safely containing underseepage and through-seepage when the water surface in the adjacent channel reaches the 100-year elevation or, in some cases, the "200-year" elevation.

Underseepage problems can occur where levees are constructed on low-permeability foundation soil (silt and clay) underlain by a layer of higher permeability (sand and gravel). Excessive underseepage makes the levee 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 a "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 on 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.

The project encompasses addressing freeboard deficiencies through levee raises; addressing seepage potential using a combination of seepage berms, cutoff walls, and relief wells; and acquiring additional right-of-way to construct the improvements and to prevent encroachment into the flood control system. In addition, the project has been designed to include an enlarged levee embankment (adjacent setback levee) along the land side of the existing Sacramento River east levee to preclude the need for substantial removal of vegetation and structural encroachments on the water side of this levee in compliance with U.S. Army Corps of Engineers (Corps) guidance. These improvements would include recontouring the levee slopes where necessary.

The following subsections summarize the methods to address freeboard deficiencies and seepage potential, which will be used in various combinations on the NCC south levee, Sacramento River east levee, and the PGCC west levee.

Levee Raises

The freeboard increases would be accomplished through raises of the existing NCC south levee or through construction of the raised adjacent setback levee adjacent to the existing Sacramento River east levee:

- Raise of existing levee (NCC south levee). A full levee raise is required for the NCC south levee, consisting of an embankment raise from the landside or waterside toe (or both) upward to the increased levee crown elevation. This requires partially excavating the levee slope to provide a working platform for equipment, typically 10 feet wide, and rebuilding the levee to the appropriate elevation by benching the new embankment material into the existing embankment material.

- Adjacent setback levee (Sacramento River east levee). The levee raise of the Sacramento River east levee would be accomplished through the construction of an "adjacent setback levee" adjoining the Sacramento River east levee. The adjacent setback levee would be constructed with a crown elevation 3 feet above the "200-year" water surface profile. In the upper reaches, where the existing levee has freeboard deficiencies of as much as 3 feet, the crown of the adjacent setback levee would be higher than the existing levee and Garden Highway roadway. In the lower reaches, where the existing levee has sufficient freeboard, the adjacent setback levee would be the same height as the existing levee.

Seepage Berms

Seepage berms are wide embankments placed outward from the landside toe of the levee to lengthen the underseepage path, thereby lowering, to acceptable levels, the erosive potential of seepage passing through permeable layers under the levees. Seepage berms typically extend 100 to 400 feet from the levee. The berm thickness depends on the severity of the seepage pressure, but generally berms are 5 feet thick near the landside toe and taper to a thickness of 3 feet at the prescribed distance from the toe. A seepage collection ditch is often constructed at the landward toe of all seepage berms. Seepage berms are planned for construction along portions of the Sacramento River east levee and the PGCC west levee.

Cutoff Walls

Conventional slurry cutoff walls are typically constructed using an excavator with a long-stick boom capable of digging a trench to the maximum required depth. Bentonite slurry is pumped into the trench during trench excavation to prevent caving. The soil, cement, and bentonite are mixed to achieve the required cutoff wall strength and permeability, and the mixture is backfilled into the trench. Select fill is used to rebuild the levee. The NLIP includes construction of cutoff walls along portions of the NCC south levee and the Sacramento east levee. Cutoff wall construction may also be required in some areas along the PGCC west levee.

For the NCC south levee, preparation for construction of the cutoff wall would begin with using scrapers (or other suitable equipment, depending on the slope) to clear and grub/strip the surface to a depth of 2 inches to remove low-growing vegetation, loose stone, and surface soils. The aggregate base from the operating road also would be removed and stockpiled for later reuse. Waste material would be hauled to an off-site location.

Construction of the cutoff wall would include degrading the existing levee to a depth equal to one-half its total height (approximately 9 feet). A 70-foot-deep cutoff wall would be constructed for the total length of 23,150 lineal feet, with the method of installation at the contractor's discretion. Material degraded to support cutoff wall construction would be compacted at the landside toe of the levee to support raising portions of the NCC south levee. Unsuitable material generated from cutoff wall construction would be disposed of off-site. Equipment that would be used in phases of the cutoff wall construction includes excavators, scrapers, loaders, bulldozers, rollers, haul trucks, water trucks, hydroseeding trucks, pickup trucks, slurry pumps, and generators.

Work on the Sacramento River east levee includes construction of an adjacent levee with construction of a cutoff wall to occur in several reaches of the adjacent levee. Borrow material would be excavated from several locations in the project area and would be delivered to the levee construction sites by scrapers or haul trucks where it would be spread by motor graders and compacted by sheepsfoot rollers to build the adjacent levee up to a height equal to about two-thirds of the height of the existing levee. This would create a working platform for cutoff wall installation using an excavator with a long-stick boom capable of digging a trench to a maximum depth of approximately 80 feet. Bentonite slurry would be pumped into the trench during excavation to prevent caving. The soil excavated from the trench would be mixed with bentonite and backfilled into the trench to create the cutoff wall.

Relief Wells

Relief wells provide protection against levee underseepage by providing a path for underseepage to exit to the ground surface at the landside toe of the levee without creating sand boils or piping levee foundation materials. Relief wells are an option for addressing underseepage in reaches where continuous sand and gravel layers have been identified by the geotechnical analysis.

Relief wells are constructed near the levee landside toe to provide pressure relief beneath surficial fine-grained soils. The wells are constructed using soil boring equipment to bore a hole vertically through the fine-grained blanket layer and into the coarse-grained aquifer layer beneath. Pipe casings and filters are installed to allow the pressurized water to flow to the ground surface, thereby relieving the pressures beneath the clay blanket. Relief wells either may discharge onto open ground or may require conveyance to a stormwater drainage system or a pump station. Relief wells cause the least amount of construction disturbance but require routine maintenance of the wells themselves and the drainage and pumping facilities necessary to support them.

EXISTING PROJECT FACILITIES AND POTENTIAL BORROW SITES

All project construction activities would take place within the Natomas Basin, except for the development of a borrow site on Reclamation District (RD) 1001 land northeast of the basin (Exhibit 2). The following sections describe the existing flood control facilities, their general setting, and adjacent irrigation infrastructure and the potential borrow sources. These features, as well as the borrow locations, constitute the physical infrastructure and locations where the project may result in effects on historic properties.

Flood Control and Irrigation Facilities

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 raised water elevations that can affect the NCC levees. For engineering purposes, the levee is divided into seven reaches. Much of the south levee contains an existing stability berm with an internal drainage system. An approximately 80- to 100-foot maintenance access area extends along the land side of the levee through most of the NCC's length.

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 The Natomas Basin Conservancy (TNBC), lie south of the NCC south levee from the eastern end of Reach 2 through the western end of Reach 6. A drainage canal, referred to as the Vestal Drain, runs parallel to the NCC south levee through much of Reach 2, approximately 100 feet from the landside levee toe. A private irrigation pump and irrigation canal are located at the landside levee toe in Reach 1. Natomas Central Mutual Water Company's (NMWC's) Bennett Pumping Plant and RD 1000's Pumping Plant No. 4 are located in Reach 2, and the NMWC Northern Pumping Plant is located in Reach 3. NMWC's North Main Canal runs parallel to the levee through Reaches 4 and 5, approximately 100 feet from the landside levee toe.

SACRAMENTO RIVER EAST LEVEE

An 18-mile-long section of the east levee of the Sacramento River protects the west side of the Natomas Basin between the NCC and the American River. For planning purposes, the levee is divided into 20 reaches. The Garden Highway is located on top of the levee crown within all 20 reaches. A drained, 10-foot-wide stability berm is present on the landside slope of the levee between the NCC and Powerline Road (Reaches 1–12). Cutoff walls were previously constructed through the levee in Reaches 12–20.

The land uses along the levee vary from north to south. Along the land side, Reaches 1–13 are bordered mainly by private agricultural lands containing a few rural residences, Airport bufferlands, and two farmed TNBC parcels. Teal Bend Golf Club is west of the Airport, adjacent to the levee along Reach 6. The parcels bordering Reaches 14–18 contain more residences, several rural estates, and three TNBC parcels. The land side of Reaches 19 and 20 is bordered by residential subdivisions, a business park, and City parklands.

Several irrigation canals, pipelines, wells, and pump stations exist along the Sacramento River east levee. The Elkhorn Canal and the Riverside Canal are key agricultural irrigation canals in the NMWC system. The Elkhorn Canal runs parallel to the Sacramento River east levee from the North Drainage Canal in Reach 4B through Reach 8 and into the start of Reach 9 (1,250 feet south of Elkhorn Boulevard). The Riverside Canal extends from just north of Reach 13 to the middle of Reach 19. Several lateral canals connect to the Elkhorn and Riverside Canals. These canals have earthen embankments with side slopes that are nearly vertical, requiring regular maintenance. Both canals are supplied by pumping plants on the Sacramento River.

In addition to the NMWC irrigation systems, there are several landowner-operated systems along the levee. These facilities are located primarily in Reaches 1–4A and 9–12, in areas not currently served by the NMWC systems. The areas are serviced by either well pumps on the land side or river pumps, which discharge into buried pipelines, small irrigation ditches, or directly onto fields. The distribution systems run along the landside toe of the levee to supply fields that slope away from the levee.

Several drainage pumping plants are operated by RD 1000 along the Sacramento River east levee. These facilities pump drain water from the main drainage canal system into the river. They include Pumping Plant No. 2, located in Reach 4B; Pumping Plant No. 5, located in Reach 10; Pumping Plant No. 3, located in Reach 13; and Pumping Plant No. 1, located in Reach 20A. Pumping Plant No. 2 was temporarily removed as part of an emergency levee repair in 2006 and would be replaced as an element of the project in 2009–2010. In addition to these RD 1000 pumping stations, the City of Sacramento operates the Willow Creek drainage pumping station which is located in Reach 19B.

Pleasant Grove Creek Canal West Levee

The PGCC west levee extends southerly from the east end of the NCC south levee to the north end of the NEMDC/Steelhead Creek levee near the Sankey Road crossing. The PGCC west levee protects the Natomas Basin from flood flows from Pleasant Grove Creek and other creeks in western Placer County, as well as from water that backs up in the NCC during high river stages in the Sacramento River. Natomas Road is located on top of the levee crown. No berms support this levee. A private canal extends parallel to the PGCC west levee for about 1,500 feet at the landside levee toe. Farms and scattered rural residences are located on the land side of the PGCC west levee, and a manufacturing facility and a railroad siding are located within several hundred feet of the levee, just south of Sankey Road.

Borrow Sites

Borrow sites are areas from which earthen materials would be removed for use in construction. The sites would be recontoured and developed as either managed marsh or grassland habitat following excavation for this use. Where borrow sites would be used over more than one construction season, the work would progress in cells that would be incrementally developed as habitat as the borrow activities are completed.

SAFCA has identified borrow sources for the project in 2008, 2009, and 2010 flood control and irrigation infrastructure improvements and redundant sources that may be pursued if negotiations regarding the preferred sources are unsuccessful or additional quantities are found to be needed during construction:

- Brookfield property (2008 preferred, 2009 preferred, 2010 preferred)
- Airport bufferlands north of the Airport complex (2008 preferred, 2009 preferred, 2010 potential)
- Fisherman's Lake area (2010 preferred) (no specific parcels identified for this borrow site)
- RD 1001 (2008 potential, 2009–2010 potential)

Except for the Fisherman's Lake area in the southern part of the Natomas Basin, these borrow areas are shown in Exhibit 3.

DESCRIPTION OF PROJECT ELEMENTS AND ACTIVITIES

The elements of the project are described in this section in four broad, overlapping categories:

- levee raising and seepage remediation,
- improvements to major irrigation and drainage infrastructure,
- habitat development and management, and
- additional actions to meet Federal Emergency Management Agency (FEMA) requirements: encroachment management and bridge crossing modifications.

Expanding the landside footprint of the Sacramento River east levee necessitates redesigning and relocating the irrigation and drainage infrastructure currently located along the landside toe of the levee. Relocation of other major and minor irrigation and drainage canals located near the NCC south levee and the PGCC west levee will be necessary with implementation of levee improvements. Modifications to the existing irrigation and drainage systems will include creation of a new canal designed to provide giant garter snake (GGS) habitat and improved stormwater drainage west of the Airport (GGS/Drainage Canal).

Site preparation would entail removing trees and other large vegetation from the construction area and stripping the top 6 inches of material from the landside slope of the existing levee, the footprint of the adjacent setback levee, the seepage berm areas, and the 50-foot-wide permanent maintenance access corridor. Large roots and

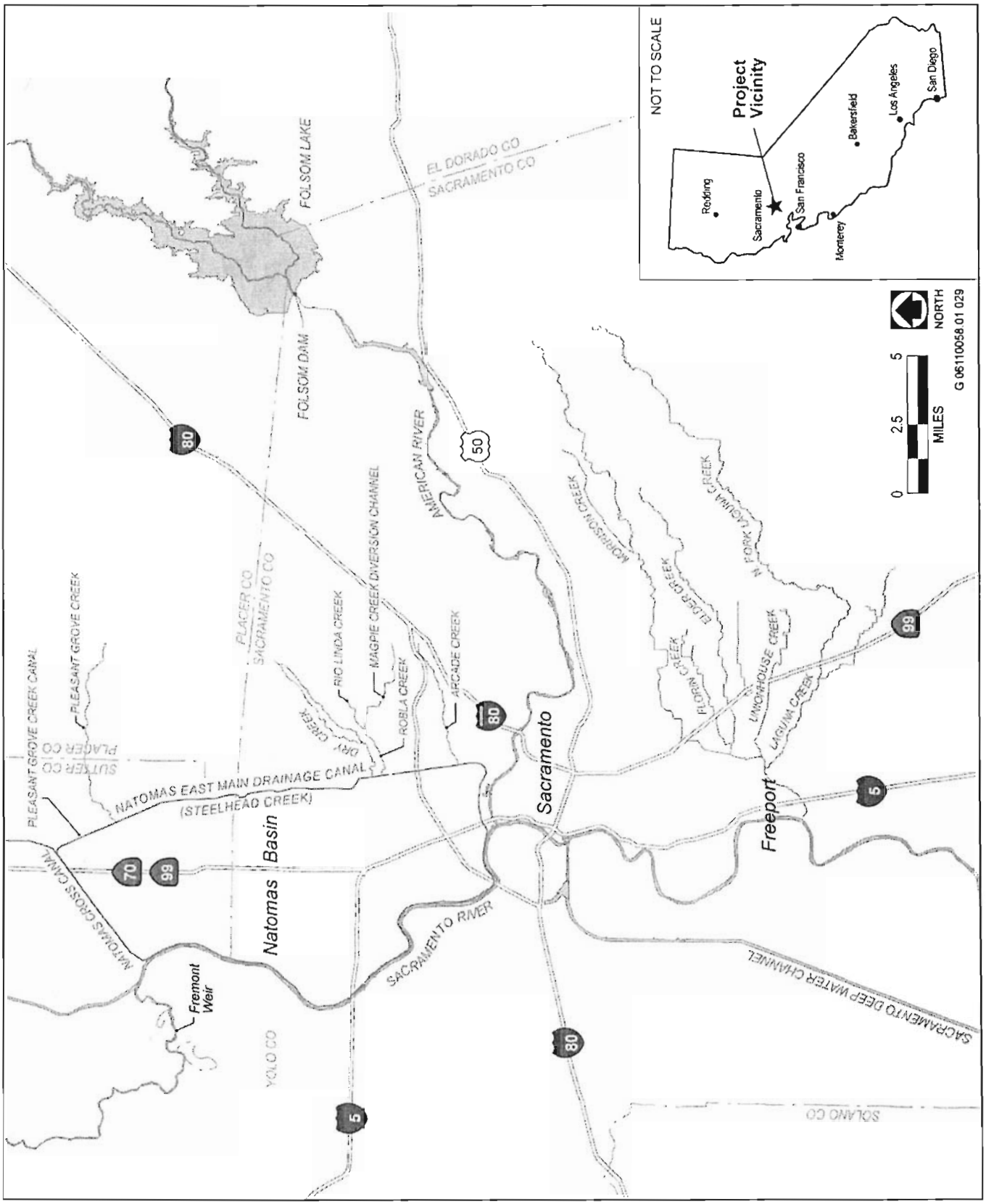
deleterious material would then be grubbed from the working area. To the extent feasible, trees that must be removed from within the footprint of the adjacent setback levee or berms would be relocated outside of the footprint to new woodland planting areas, where a substantial number of new trees would also be planted. Excess earth materials (organic soils, roots, and grass from borrow areas and the adjacent levee foundation and excavated material that does not meet levee embankment criteria) would be used in the reclamation of borrow areas or hauled off-site to landfills. Cleared vegetation (i.e., trees, brush) would be hauled off-site to landfills. After construction, the levee slopes and any previously vegetated areas disturbed during construction, including staging areas, would be seeded with a grass mix.

The major project elements and related activities are summarized in Table 1.

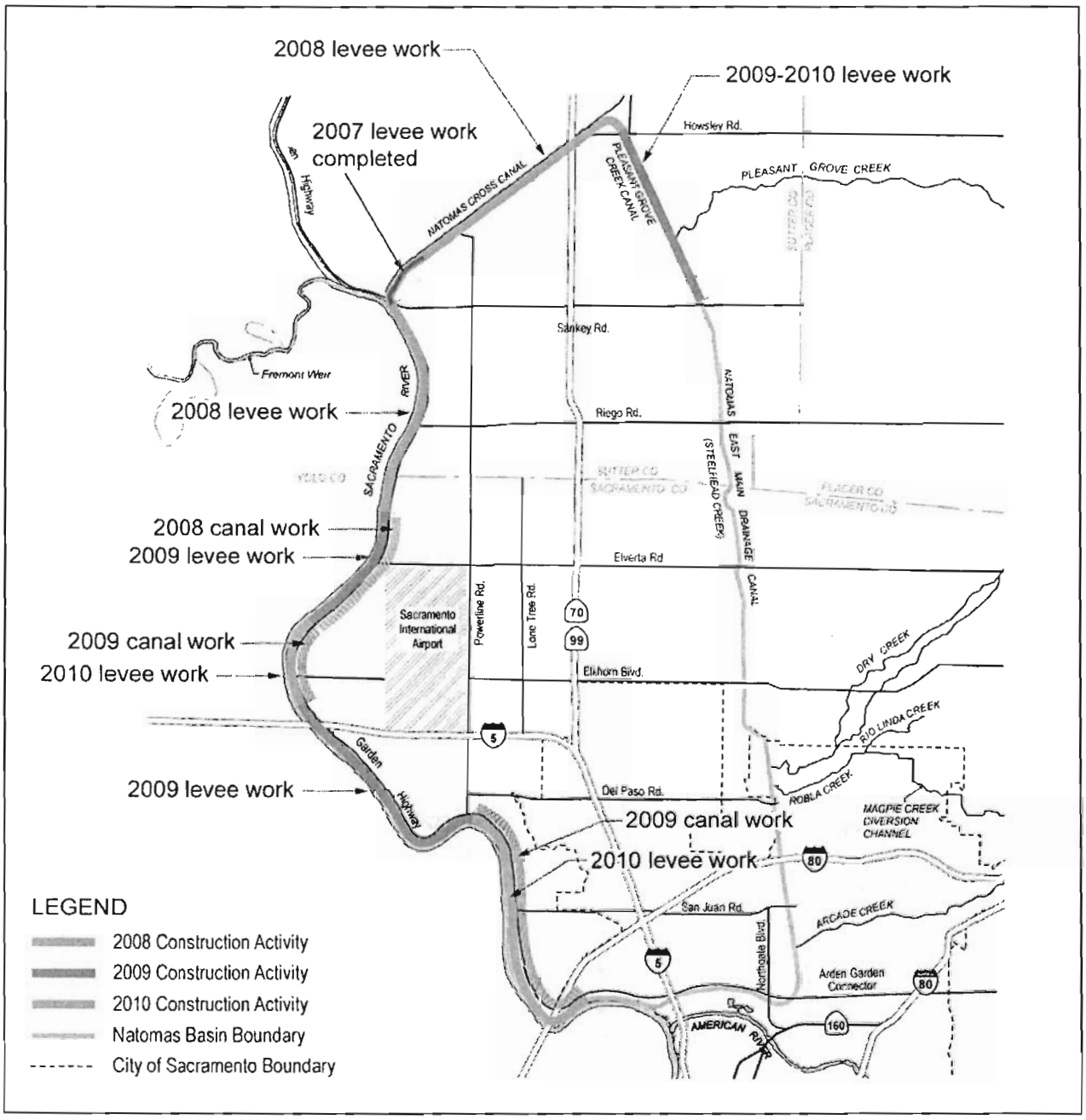
Table 1
Summary of the Major Elements of the Project

Project Element	Project Activity and Timing
2008 Construction	
Levee raising and seepage remediation: NCC south levee	Raise and realign the NCC south levee to provide additional freeboard and more stable waterside and landside slopes and to reduce the need for removal of waterside vegetation. (May 8–November 1, 2008) Construct a seepage cutoff wall through the levee crown in Reaches 3–7. (May 8–October 15, 2008)
Levee raising and seepage remediation: Sacramento River east levee (adjacent setback levee)	Construct a raised adjacent setback levee from the NCC to just south of the North Drainage Canal (Reaches 1–4B, except Stations 55+00 to 68+00 in Reach 2) with a 100-foot seepage berm in Reach 4A and a 300-foot seepage berm in Reach 4B. (May 1–November 1, 2008)
Improvements to major irrigation and drainage infrastructure	Construct a new canal designed to provide drainage and associated giant garter snake habitat (the GGS/Drainage Canal) between the North Drainage Canal and Elkhorn Reservoir. (May 1–November 1, 2008) Relocate the Elkhorn Canal (highline irrigation canal) between the North Drainage Canal and Elkhorn Reservoir in anticipation of the filling of the existing Elkhorn Canal at the toe of the Sacramento River east levee in late 2008 and in 2009. (May 1–November 1, 2008) Remove a deep culvert at the location of Pumping Plant No. 2. (May 1–November 1, 2008)
Habitat creation and management	Establish vegetative habitat features in the new GGS/Drainage Canal. (Fall 2008) Recontour and create managed marsh and grassland on lands used as borrow sources. (Fall 2008 or spring 2009) Establish grassland on the adjacent setback levee slopes and seepage berms. (August 1–December 31, 2008) Install woodland plantings to offset the loss of portions of tree groves in the landside levee footprint. (Fall 2008)
Right-of-way acquisition	Acquire right-of-way through fee title or easement interest within the footprint of the project features, at the borrow sites and along the flood control system. (Before construction)
2009–2010 Construction	
Levee raising and seepage remediation: Sacramento River east levee (adjacent setback levee)	Construct an adjacent setback levee along Stations 55+00 to 68+00 in Reach 2 and from just south of the North Drainage Canal to the American River north levee (Reaches 5A–20B), raised where needed to provide adequate freeboard, with seepage berms, relief wells, and cutoff walls for seepage remediation as required (specific seepage remediation measures are still under study). (May 1–November 1, 2009, and May 1–November 1, 2010)
Seepage remediation: PGCC west	Flatten waterside and landside slopes, and construct seepage berms along the PGCC west levee (specific berm widths and potential use of cutoff walls in some areas to be

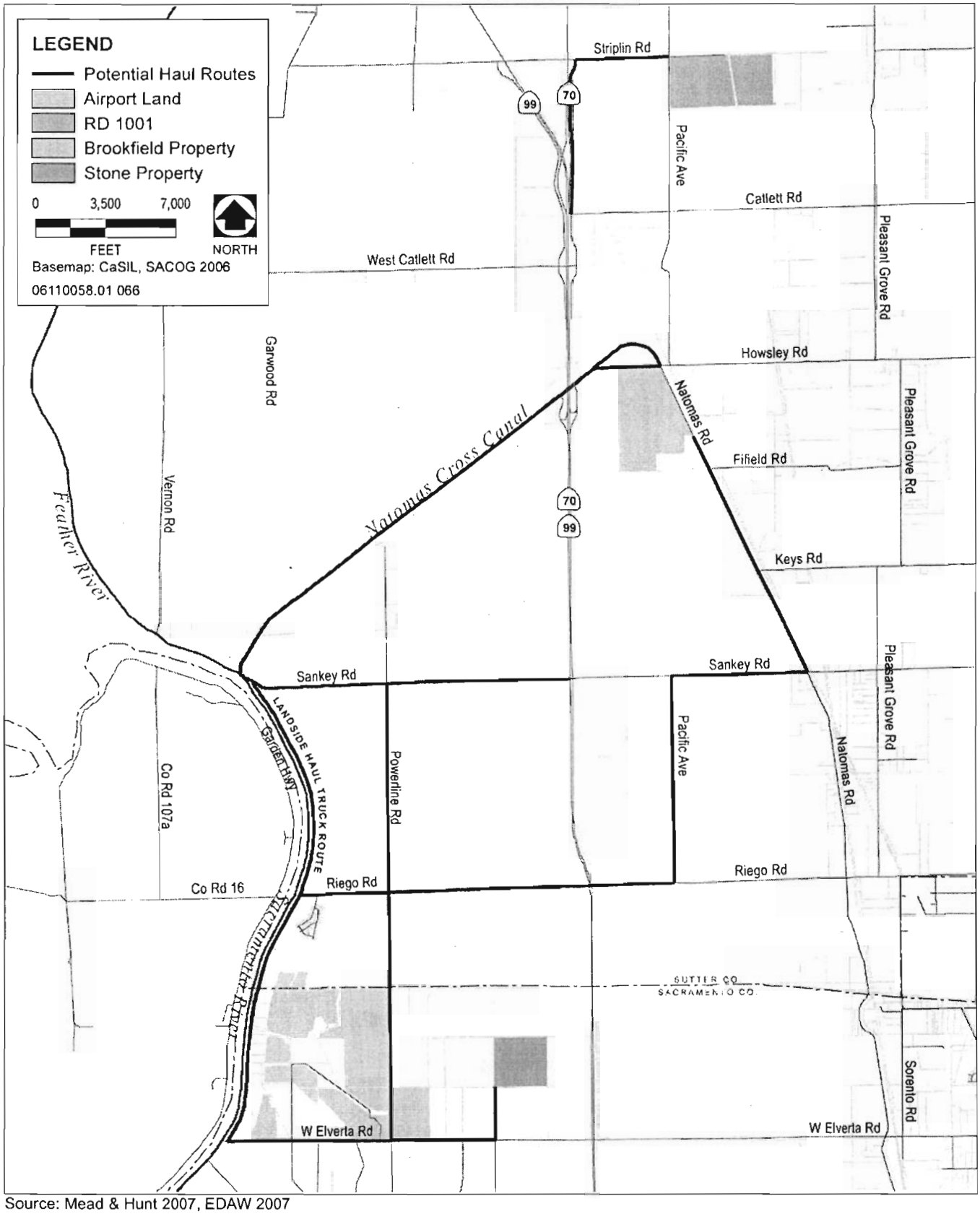
Table 1 Summary of the Major Elements of the Project	
Project Element	**Project Activity and Timing**
levee	determined). (May 1–November 1, 2010)
Improvements to major irrigation and drainage infrastructure	Construct the new GGS/Drainage Canal between Elkhorn Reservoir and the West Drainage Canal (specific alignment to be determined), and improve the West Drainage Canal to provide enhanced giant garter snake habitat. (May 1–November 1, 2009) Implement Airport West Ditch improvements in connection with construction of the GGS/Drainage Canal to allow the Airport to decommission the agricultural irrigation function of this facility and eliminate the hazards currently associated with it. The Airport stormwater detention function provided by this ditch would continue. The ditch would therefore be recontoured as a gently sloping swale to facilitate periodic maintenance such as mowing. (May 1–November 1, 2009) Relocate the Riverside Canal and the Elkhorn Canal downstream of Elkhorn Reservoir (specific alignments to be determined) and fill the existing canals. (May 1–November 1, 2009) Construct RD 1000 Pumping Plant No. 2. (April 1, 2009–September 1, 2010)
Habitat creation and management	Establish habitat enhancements in the new GGS/Drainage Canal and improved West Drainage Canal. (Fall 2009) Recontour and create marsh and managed grassland on lands used as borrow sources. (Fall or spring after borrow excavation in 2009 and 2010) Establish grassland on the adjacent setback levee slopes and seepage berms. (Fall after construction in 2009 and 2010) Install woodland plantings to offset the loss of portions of tree groves in the landside levee footprint (locations to be determined). (Fall 2009 and 2010)
Additional actions to meet FEMA requirements: encroachment management on the Sacramento River east levee, and bridge crossing modifications at the NCC	Remove encroachments from a portion of the water side and land side of the Sacramento River east levee as needed to ensure that the levee can be certified as meeting the minimum requirements of the NFIP and USACE design criteria (specific criteria still under discussion). (Timing to be determined) Modify the SR 99/70 crossing of the NCC as needed to meet FEMA requirements. (Timing to be determined)
Right-of-way acquisition	Acquire right-of-way through fee title or easement interest within the footprint of the project features, at the borrow sites and along the flood control system. (Before construction)
Notes: Airport = Sacramento International Airport; Elkhorn Canal = Elkhorn Main Irrigation Canal; FEMA = Federal Emergency Management Agency; GGS = Giant Garter Snake; NCC = Natomas Cross Canal; NFIP = National Flood Insurance Program; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; Riverside Canal = Riverside Main Irrigation Canal; SR = State Route; USACE = U.S. Army Corps of Engineers	



Project Location **Exhibit 1**



Project Construction By Phase **Exhibit 2**



Source: Mead & Hunt 2007, EDAW 2007

Anticipated Borrow Areas and Local Haul Routes **Exhibit 3**