4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

This chapter (1) describes the approach to the Phase 4b Project environmental analysis (Section 4.1); (2) analyzes the significant environmental impacts of the Phase 4b Project and presents mitigation measures, organized by issue area (Sections 4.2–4.17); and (3) summarizes significant environmental impacts from previous NLIP Landside Improvements Project phases (1–4a) (Section 4.18).

4.1 APPROACH TO THE ENVIRONMENTAL ANALYSIS

An environmental document prepared to comply with the National Environmental Policy Act (NEPA) must consider the context and intensity of the environmental effects that would be caused by, or result from, the Proposed Action and other alternatives under evaluation. Under NEPA, the significance of an effect is used to determine whether an environmental impact statement must be prepared. An environmental document prepared to comply with the California Environmental Quality Act (CEQA) must identify the significance of the environmental effects of a proposed project. A “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project (State CEQA Guidelines California Code of Regulations [CCR] Section 15382).

4.1.1 SECTION CONTENTS

Sections 4.2 through 4.17 of this EIS/EIR follow the same general format and are each organized into the following major components:

► Methodology and Thresholds of Significance: This subsection describes the methods, process, procedures, and/or assumptions used to formulate and conduct the impact analysis. It also presents the significance criteria (or “thresholds of significance”) used to define the level at which an impact would be considered significant in accordance with CEQA. Thresholds may be quantitative or qualitative; they may be based on agency or professional standards or on legislative or regulatory requirements that are relevant to the impact analysis. Generally, however, the thresholds of significance used are derived from Appendix G of the State CEQA Guidelines, as amended; NEPA, where defined; factual or scientific information and data; and regulatory standards of Federal, state, regional, and local agencies. These thresholds also include the factors taken into account under NEPA to determine the significance of the action in terms of the context and the intensity of its effects.

► Environmental Impacts and Mitigation Measures: This analysis examines the significant impacts that would occur with implementation of the Proposed Action or an alternative under consideration. Impacts and mitigation measures are numbered sequentially in each section, with mitigation measures corresponding to the impact being addressed. For instance, impacts in Section 4.2, “Agricultural Resources,” are numbered Impact 4.2-a, and Mitigation Measure 4.2-a corresponds with Impact 4.2-a. An impact statement precedes the discussion of each impact. The discussion that follows the impact statement includes substantial evidence to support the stated conclusion.

Many of the potential impacts that may result from implementation of the action alternatives would be temporary effects resulting from construction activities, including hauling of borrow material and the movement of heavy construction equipment. However, impacts related to most agricultural land conversion; modification and loss of habitats, including fill of waters of the United States; and disturbance of cultural resources would be either short-term or permanent long-term effects.

The impacts of each alternative are compared to the impacts of the Proposed Action at the end of each impact discussion in this chapter, and are described as “similar,” “greater,” “lesser,” or “currently unknown.”
Following each discussion of a significant or potentially significant impact, mitigation measures are provided to avoid, minimize, or reduce the significant or potentially significant impacts to a less-than-significant level, where available and feasible. In accordance with California Public Resources Code (PRC) Section 21081.6(b), mitigation measures must be fully enforceable through permit conditions, agreements, other legally binding instruments, or by incorporating the measures into the project design. CCR Section 15370 of the State CEQA Guidelines defines mitigation as:

- avoiding the impact altogether by not taking a certain action or parts of an action;
- minimizing impacts by limiting the degree of magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operation during the life of the action; or
- compensating for the impacts by replacing or providing substitute resources or environments.

Mitigation measures, beyond those adopted for the Phase 1–4a Projects, are not required for impacts identified under the No-Action Alternative because, under the No-Action Alternative, no Phase 4b Project would be approved and the project proponent(s) would not be required to obtain permits or enter into agreements associated with the Phase 4b Project. Additionally, USACE would not issue permission, permits, or authorizations for the No-Action Alternative, other than those already issued/granted for the Phase 1–4a Projects. For these reasons, mitigation measures are not provided for the No-Action Alternative in Sections 4.2 through 4.17 of this EIS/EIR.

Residual Impacts: This subsection describes which impacts would remain significant following implementation of mitigation measures. For each impact, either the impact would be reduced to a level below the significance threshold (reduced to a less-than-significant level) or it is concluded that feasible mitigation is not available or is insufficient to reduce the impact to a less-than-significant level. When an impact cannot be reduced to a less-than-significant level, it is called a “significant and unavoidable” impact on the environment. Under CEQA, if significant and unavoidable impacts remain, an agency may approve a project if it finds, pursuant to California PRC Section 21081, (i) that the agency has considered and approved all feasible mitigation measures; (ii) that any alternative that would reduce the severity of the significant unavoidable impacts is infeasible; and (iii) that the overriding economic, social, or other benefits of the project outweigh the significant impacts.

4.1.2 TERMINOLOGY USED TO DESCRIBE IMPACTS

4.1.2.1 IMPACT LEVELS

The EIS/EIR uses the following CEQA terminology to denote the significance of environmental impacts, because CEQA is more stringent than NEPA:

- No impact indicates that the construction, operation, and maintenance of the Proposed Action or an alternative under consideration would not have any direct or indirect impacts on the physical environment. It means that no change from existing conditions would result. This impact level does not require mitigation.

- A less-than-significant impact is one that would not result in a substantial or potentially substantial adverse change in the physical environment. This impact level does not require mitigation, even if applicable measures are available; however, measures may be recommended to further reduce less-than-significant impacts.
► A **significant impact** is defined by California PRC Section 21068 as one that would cause “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project.” Under CEQA, mitigation measures and alternatives to the Proposed Action must be identified, where applicable and feasible, to avoid, minimize, rectify, compensate, or reduce significant impacts to a less-than-significant level.

► A **potentially significant impact** is one that, if it were to occur, would be considered a significant impact as described above; however, the occurrence of the impact cannot be immediately determined with certainty. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Therefore, under CEQA, mitigation measures and alternatives to the Proposed Action must be identified, where feasible, to avoid, minimize, rectify, compensate, or reduce significant impacts to a less-than-significant level.

► A **significant and unavoidable impact** is one that would result in a substantial or potentially substantial adverse effect on the physical environment and that cannot be fully reduced to a less-than-significant level even with implementation of any applicable feasible mitigation. Under CEQA, a project with significant and unavoidable impacts may proceed, but the CEQA lead agency (SAFCA) would be required (i) to conclude in findings that there are no feasible means of substantially lessening or avoiding the significant impact in accordance with State CEQA Guidelines CCR Section 15091(a)(3) and (ii) to prepare a statement of overriding considerations, in accordance with State CEQA Guidelines CCR Section 15093, explaining why the CEQA lead agency has chosen to proceed with the project in spite of the potential for significant impacts on the physical environment.

► An impact may have a level of significance that is too uncertain to be reasonably determined, and would therefore be considered **too speculative for meaningful consideration** in accordance with State CEQA Guidelines CCR Section 15145. Where some degree of evidence points to the reasonable potential for a significant effect, the EIS/EIR may explain that a determination of significance is uncertain, but is still assumed to be “potentially significant,” as described above. In other circumstances, after thorough investigation, the determination of significance may still be considered too speculative to be meaningful. This is an effect for which the degree of significance cannot be determined for specific reasons, such as unpredictability of the occurrence or the severity of the impact, lack of methodology to evaluate the impact, or lack of an applicable significance threshold.

It is important to note that under NEPA, there are no specific thresholds of significance and that environmental effects are analyzed based on their context and intensity. Because this EIS/EIR is a joint NEPA/CEQA document, the CEQA thresholds have been applied because they are more stringent. To comply with NEPA, however, the context and intensity of the environmental effects were considered for each impact mechanism.

### 4.1.2.2 Impact Mechanisms

Mechanisms that could cause impacts are discussed for each issue area. General categories of impact mechanisms are project construction and activities related to future operations and maintenance, as described in Chapter 2, “Alternatives.”

Under NEPA, the effects of the Proposed Action and alternatives under consideration, including the No-Action Alternative, are determined by comparing effects between alternatives and against effects from the No-Action Alternative. Under CEQA, the environmental impact analysis compares the Proposed Action and alternatives under consideration, including the No-Project Alternative (referred to in this EIS/EIR as the No-Action Alternative), to existing conditions, defined at the time when the notice of preparation was published (November 5, 2009). Consequently, baseline conditions differ between NEPA and CEQA. Under NEPA, the No-Action Alternative (i.e., expected future conditions without the project) is the baseline to which the action alternatives are compared, and the No-Action Alternative is compared to existing conditions. Under CEQA, existing conditions are the baseline to which all alternatives are compared.
Project impacts are effects that are categorized, pursuant to NEPA and CEQA, to describe the context and intensity. Project effects fall into the following categories:

- **A temporary impact** would occur only during construction. The environmental analysis addresses potentially significant impacts from the direct impact of construction at the project site, direct impact associated with site development, and indirect construction impacts associated with fill and wetland construction activities and construction traffic.

- **A short-term impact** would last from the time construction ceases to within 3 years following construction.

- **A long-term impact** would last longer than 3 years following construction. In some cases, a long-term impact could be considered a permanent impact.

- **A direct impact** is an impact that would be caused by an action and would occur at the same time and place as the action.

- **An indirect impact** is an impact that would be caused by an action but would occur later in time or at a distance that is removed from the project area, but is reasonably foreseeable, such as growth-inducing effects and other changes related to changes in land use patterns and related effects on the physical environment.

- **A residual impact** is an impact that would remain after implementation of mitigation.

- **A cumulative impact** is an impact that is cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project, even if individually limited, are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

If it approves the Proposed Action, the SAFCA Board of Directors will adopt a mitigation monitoring and reporting program (MMRP) at the time that it certifies the EIR, in accordance with California PRC Section 21081.6(a). The purpose of the MMRP is to ensure that the mitigation measures adopted by SAFCA as part of project approval will be complied with during project construction and implementation. The MMRP will identify each of the mitigation measures and describe the party responsible for monitoring and reporting, the timeframe for implementation, and the program for monitoring compliance.

The SAFCA Board of Directors will also be required to adopt findings with respect to each significant impact of the project (California PRC Section 21081).

### 4.1.3 SUMMARY OF PREVIOUS NEPA AND CEQA ANALYSES OF BORROW SITES

As noted in Section 2.3.4.4, “Borrow Sites,” construction of the Phase 4b Project would use soil borrow material from a combination of sites analyzed in previous NEPA and CEQA documents, and from proposed new borrow sites analyzed as part of this EIS/EIR. The new sites include the South Fisherman’s Lake Borrow Area, West Lakeside School Site, Natomas Unified School District, and Triangle Area Borrow Area. These sites are analyzed in Sections 4.2 through 4.17 of this EIS/EIR.

The following sites have been analyzed in previous NEPA and CEQA documents because they were identified as potential sources of borrow material for the Phase 3 and 4 Projects: Fisherman’s Lake Borrow Area (includes Natomas Boot/ Bollinger), Krumenacher, and Twin Rivers Unified School District stockpile.

As previously discussed in Section 1.1.4, “Documents Incorporated by Reference,” NEPA encourages incorporation by reference under the Council on Environmental Quality (CEQ) regulations, and the State CEQA Guidelines allow for incorporation by reference where project-specific analysis is tiered from previous analysis. Table 4.1-1 provides a citation to the previous environmental documents that include discussions of these borrow
sites. Because these borrow sites have been included in the project description for the overall NLIP Landside Improvements Project (at a program level) and in previous project phases (at a project level), the proposed use of these borrow sites has informed the environmental impact analyses in this EIS/EIR for appropriate impact topics. Accordingly, analysis of these sites in this EIS/EIR is limited to impacts not previously covered, which are unique to the Phase 4b Project.

<p>| Table 4.1-1 |
| Borrow Site Project Description Information Contained in Previous NEPA and CEQA Documents for Previous Project Phases |</p>
<table>
<thead>
<tr>
<th>Borrow Site/Area</th>
<th>Citation</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 2 EIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisherman’s Lake Borrow Area</td>
<td>SAFCA 2007: 2-9</td>
<td>Described in Section 2.2.2, “Borrow Sites,” as a preferred borrow site for the 2010 construction phase (later named the Phase 4 Project)</td>
</tr>
<tr>
<td>Fisherman’s Lake Borrow Area</td>
<td>SAFCA 2007:2-33</td>
<td>Identified as a source of borrow material for the improvements to Sacramento River east levee Reaches 4B–20A (i.e., the Phase 3 and 4 Projects)</td>
</tr>
<tr>
<td><strong>Phase 2 EIS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisherman’s Lake Borrow Area</td>
<td>USACE 2008: 2-14</td>
<td>Described as a preferred borrow site for the 2010 construction phase (later named the Phase 4 Project)</td>
</tr>
<tr>
<td>Fisherman’s Lake Borrow Area</td>
<td>USACE 2008:2-33</td>
<td>Identified as a source of borrow material for the improvements to Sacramento River east levee Reaches 5A–20A (i.e., the Phase 3 and 4 Projects)</td>
</tr>
<tr>
<td><strong>Phase 3 EIS and EIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krumenacher</td>
<td>USACE and SAFCA 2009a:2-30</td>
<td>Identified in Table 2-2, “Potential Borrow Sites”</td>
</tr>
<tr>
<td>Twin Rivers Unified School District stockpile</td>
<td>USACE and SAFCA 2009a:2-30</td>
<td>Identified in Table 2-2, “Potential Borrow Sites”</td>
</tr>
<tr>
<td><strong>Phase 4a EIS and EIR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisherman’s Lake Borrow Area</td>
<td>USACE and SAFCA 2009b:2-64</td>
<td>Identified in Table 2-10, “Potential Borrow Sites for the Phase 4a Project”</td>
</tr>
<tr>
<td>Krumenacher</td>
<td>USACE and SAFCA 2009b:2-64</td>
<td>Identified in Table 2-10, “Potential Borrow Sites for the Phase 4a Project,” as a previously analyzed source</td>
</tr>
<tr>
<td>Twin Rivers Unified School District stockpile</td>
<td>USACE and SAFCA 2009b:2-64</td>
<td>Identified in Table 2-10, “Potential Borrow Sites for the Phase 4a Project,” as a previously analyzed source</td>
</tr>
</tbody>
</table>


Because the Phase 4b Project may rely on approved borrow capacity from the previously analyzed borrow sites identified above, the Phase 4b Project would indirectly contribute to impacts associated with the Phase 2, 3, and 4a Projects.
4.2 AGRICULTURAL RESOURCES

4.2.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.2.1.1 METHODOLOGY

Evaluation of the project’s potential impacts on agricultural resources was based on a review of the planning documents pertaining to the Phase 4b Project study area, including goals and policies from the Sutter County General Plan (Sutter County 1996), the Sacramento County General Plan (Sacramento County 1993), Federal plans and regulations relating to the Sacramento County Airport System (SCAS) and Federal Emergency Management Agency (FEMA), soil surveys of Sutter and Sacramento Counties (National Resources Conservation Service [NRCS] 1988, 1993), and consultation with appropriate agencies. In addition, the California Department of Conservation (DOC) (DOC 2008) Important Farmland maps and California Land Conservation Act (commonly known as the Williamson Act [California Government Code Section 51200 et seq.]) maps for Sutter and Sacramento Counties were used to determine the agricultural significance of the lands on the project area.

For purposes of this analysis, it was assumed that reclamation of borrow sites by returning the topsoil layer to the site would not adversely affect a site’s long-term agricultural productivity and, therefore, its status as Important Farmland under the Important Farmland Mapping and Monitoring Program (FMMP) would not be changed permanently. This assumption would not apply to those sites that would be converted to non-agricultural habitat (e.g., woodlands, as opposed to row crops that can be used for foraging habitat). Non-agricultural mitigation sites would be preserved as habitat in perpetuity, permanently affecting their long-term agricultural productivity and status as Important Farmland.

4.2.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to agricultural resources if they would do any of the following:

► convert Important Farmland (i.e., Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to nonagricultural use;

► involve other changes in the existing environment which, due to their location or nature, could result in conversion of Important Farmland to nonagricultural use or conversion of forest land to non-forest use;

► conflict with existing zoning for agricultural use or a Williamson Act contract;

► conflict with existing zoning for, or cause rezoning of, forest land (as defined in California Public Resources Code Section 12220[g]), timberland (as defined in California Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by California Government Code Section 51104[g]); or

► result in the loss of forest land or conversion of forest land to non-forest use.

A review of the forestry and timber maps prepared by the California Department of Forestry and Fire Protection as part of the Fire and Resource Assessment Program’s 2003 Forest and Range Assessment indicates that the land cover in the Natomas Basin, including the Phase 4b Project area, consists overwhelmingly of agriculture, with urban land limited to the southern portion of the Basin, and some herbaceous land located along the NEMDC
Because the Basin does not include forest land or timberland, the Phase 4b Project would not conflict with existing zoning for either land category or result in the loss or conversion of these lands. These issues are therefore not addressed further in this EIS/EIR.

### 4.2.2 Impacts and Mitigation Measures

**Impact 4.2-a: Conversion of Important Farmland to Non-agricultural Uses**

Table 4.2-1 summarizes the Phase 4b Project’s potential impacts to Important Farmland. Loss and conversion of agricultural lands on a cumulative basis is addressed in Chapter 5, “Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements.”

<table>
<thead>
<tr>
<th>Project Component/Location</th>
<th>No-Action Alternative</th>
<th>Adjacent Levee Alternative (Proposed Action) (Acres)</th>
<th>Fix-in-Place Alternative (Acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permanent Conversion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento River east levee (adjacent levee footprint, seepage berm, and O&amp;M/utility corridor)</td>
<td>-</td>
<td>27.58</td>
<td>25.80</td>
</tr>
<tr>
<td>Natomas Cross Canal (Vestal Drain and Morrison Canal)</td>
<td>-</td>
<td>89.59</td>
<td>89.59</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal (maximum Phase 4b Project footprint increment; adding to 60 acres addressed in the Phase 3 EIS and EIR)</td>
<td>-</td>
<td>33.71</td>
<td>33.71</td>
</tr>
<tr>
<td>Natomas East Main Drainage Canal North (limit of construction)</td>
<td>-</td>
<td>64.63</td>
<td>64.63</td>
</tr>
<tr>
<td>West Drainage Canal (maximum footprint)</td>
<td>-</td>
<td>44.57</td>
<td>44.57</td>
</tr>
<tr>
<td>Riego Road Canal relocation</td>
<td>-</td>
<td>6.43</td>
<td>6.43</td>
</tr>
<tr>
<td>Detention basin creation at Triangle Properties Borrow Area</td>
<td>-</td>
<td>148.35</td>
<td>148.35</td>
</tr>
<tr>
<td>Brookfield Borrow Site marsh conversion</td>
<td>-</td>
<td>203.00</td>
<td>203.00</td>
</tr>
<tr>
<td>Chappell Drain and Ditch improvement</td>
<td>-</td>
<td>27.80</td>
<td>27.80</td>
</tr>
<tr>
<td>Potential woodland plantings on TNBC preserves and at other available sites within the Natomas Basin</td>
<td>-</td>
<td>32.00</td>
<td>30.00</td>
</tr>
<tr>
<td><strong>Total Permanent Conversion</strong></td>
<td>-</td>
<td>677.66</td>
<td>673.88</td>
</tr>
<tr>
<td><strong>Temporary Conversion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Fisherman’s Lake Borrow Area</td>
<td>-</td>
<td>214.00</td>
<td>214.00</td>
</tr>
<tr>
<td>Triangle Properties Borrow Area (excluding detention basins)</td>
<td>-</td>
<td>141.65</td>
<td>141.65</td>
</tr>
<tr>
<td><strong>Total Temporary Conversion</strong></td>
<td>-</td>
<td>355.65</td>
<td>355.65</td>
</tr>
</tbody>
</table>

Notes: O&M = operations and maintenance

1. Important Farmland converted by the relocation of the Morrison Canal and Vestal Drain would include 33.41 acres converted within the new alignments and 56.18 acres that are assumed to be unfarmable remnants created by the relocation of the canal and drain. Two remnants associated with the Vestal Drain would amount to 21.36 acres and 19.72 acres located in approximately 280-foot-wide strips between the relocated drain and the NCC south levee. Two remnants associated with the Morrison Canal would amount to a 2.75-acre piece located between SR 99, Howsley Road, a farm house, and the relocated canal; and a 12.35-acre and approximately 280-foot-wide strip located between the relocated canal and the NCC south levee.

2. The existing West Drainage Canal would be filled and could potentially be returned to cultivation, partially compensating for the loss of farmland; however, the suitability of the abandoned canal for cultivation is uncertain and the status of the land as Important Farmland would be determined by the California Department of Conservation. The worst case, namely, that the abandoned and filled canal would not be classified as Important Farmland, is presented here.

3. The existing Riego Road Canal would be filled in and covered by the expanded NEMDC west levee.

4. Temporary conversion of Important Farmland; borrow sites would be reclaimed and returned to agricultural uses.

Source: Data compiled by AECOM in 2009
No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities associated with the Phase 4b Project would occur; therefore, there would be no conversion of any Important Farmland. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of a levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. A levee failure along the Sacramento River east levee could result in scouring of agricultural land and the long-term loss of topsoil in areas near a levee breach. This could result in a permanent loss of Important Farmland in those areas. Such a loss is evident at the locations of past levee failures, for example on the Feather River above Star Bend in Yuba County, where a large dense stand of willow riparian scrub grows in sediments deposited by floodwaters following the scouring of the agricultural soil by the force of in-rushing water. Such losses are typically limited to localized areas within several hundred feet of a levee breach. (The indirect effects of lack of flood risk reduction on urban development and Important Farmland conversion have been addressed as part of the NLIP cumulative and growth-inducing impact analyses (see Chapter 5, “Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements”) The effects of a single or isolated levee failure on the permanent loss of Important Farmland would be localized at the point of the levee breech and would be less than significant. Simultaneous levee failures in more than one location in the perimeter levee system would have a more widespread effect. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

Important Farmland mapping for the Natomas Basin is shown in Plate 3-1 and Important Farmland classifications are described in detail in Section 3.2, “Agricultural Resources.” Nearly all of the agricultural lands within the footprint of flood damage reduction facilities are classified as Prime Farmland, Farmland of Statewide Importance, or Farmland of Local Importance. Table 4.2-1 shows the potential maximum acreage of Important Farmland that would be permanently converted to nonagricultural uses with project implementation. This conversion includes the levee improvements that would occur within a corridor along Sacramento River east levee Reach A:16–20 (see description in Section 2.3.3.2, “Sacramento River East Levee,” and Plates 2-7a and 2-7b). These improvements would include the footprint of the adjacent levee, seepage berms that could be up to 300 feet wide, an O&M corridor, a utility corridor, and in-Basin woodland plantings to compensate for loss of woodlands that would be removed for levee construction. The Lower Dry Creek woodland planting area, where up to 40 acres of woodland would be preserved or created, does not contain Important Farmland. As discussed in Chapter 2, “Alternatives,” seepage berms would only be required in select locations along the levee, depending upon final project design; therefore, the width of the corridor adjacent to the new adjacent levee may be narrower than assumed here for purposes of worst-case analysis. No farmland would be converted in the corridor along American River north levee Reach I:1–4.

As shown in Table 4.2-1, levee and canal improvements would also convert Important Farmland along the west levees of the PGCC and NEMDC North, along the NCC south levee (Vestal Drain and Morrison Canal relocations), and at the West Drainage Canal (a portion of which would be realigned, as described in Section 2.3.3.3, “Irrigation and Drainage Components”). The widening and extension of the Chappell Drain and Ditch in the vicinity of the Brookfield borrow site would also convert Important Farmland. The conversion of these areas to nonagricultural uses would be permanent, and therefore this impact would be significant.
Soil borrow for construction would be obtained from the proposed borrow sites described in Section 2.3.3.4 “Borrow Sites,” and shown in Plate 2-6. Table 4.2-1 shows the total acreage of Important Farmland that would be permanently and temporarily converted to nonagricultural uses with project implementation; and Table 2-23 lists the potential borrow sites, excavation area and depth, post-borrow depth, and proposed post-borrow (reclaimed) use. Borrow sites that are classified as Important Farmland include the South Fisherman’s Lake Borrow Area (Plate 2-7a), Brookfield Borrow Site, and the Triangle Properties Borrow Area (Plate 2-13).

Only portions of each property, and not the entire property, may ultimately be used for borrow. The decision as to which properties would be used has not yet been made by the project proponent(s). The decision would depend on the quality of borrow material; and avoidance and/or minimization of significant environmental effects, such as damage to cultural resources, tree removal, wetlands, and special-status species habitat. The potential borrow sites in the South Fisherman’s Lake Borrow Area include lands classified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. The Brookfield Borrow Site, which would be converted to marsh habitat, is classified as Prime Farmland. The potential borrow sites in the Triangle Properties Borrow Area include lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Reclamation of all borrow sites would be performed in compliance with the California Surface Mining and Reclamation Act (SMARA) and would entail preservation and replacement of the topsoil on these parcels, thus retaining their potential use for agriculture.

Sites that the project proponent(s) intend to reclaim and return to agricultural use (field crops, including rice) are listed in Table 4.2-1 under “Temporary Conversion.” The use of these sites for borrow would not represent a permanent conversion to nonagricultural uses. However, Important Farmland within the Triangle Properties Borrow Area could be permanently converted for use as detention basins if culverts under the PGCC are removed, and the Brookfield Borrow Site would be permanently converted to marsh habitat.

The temporary and permanent conversion of Important Farmland as a result of construction of the Phase 4b Project would be a significant impact.

### Fix-in-Place Alternative

Temporary and permanent conversion of Important Farmland under the Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action) for all project components, except that the width of the levee improvements in Sacramento River east levee Reach A:16–20 would be reduced by 15 feet, decreasing the acreage of farmland that would be permanently converted under this alternative by approximately one acre, as shown in Table 4.2-1.

The temporary and permanent conversion of Important Farmland to flood damage reduction features and borrow uses under the Fix-in-Place Alternative would be a significant impact. (Similar)

### Mitigation Measure 4.2-a: Minimize Important Farmland Conversion to the Extent Practicable and Feasible

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The project proponent(s) shall implement the measures listed below with regard to Prime Farmland, Unique Farmland, Farmland of Statewide Importance, and Farmland of Local Importance to minimize impacts on these lands.

(a) Borrow sites shall be configured to minimize the fragmentation of lands that are to remain in agricultural use. Contiguous parcels of agricultural land of sufficient size to support their efficient use for continued agricultural production shall be retained to the extent practicable and feasible.

(b) To the extent practicable and feasible, when expanding the footprint of a flood risk reduction facility (e.g., levee or berm) onto agricultural land, the most productive topsoil from the construction footprint shall be salvaged and redistributed to less-productive
agricultural lands in the vicinity of the construction area that could benefit from the introduction of good-quality soil. By agreement between the implementing agencies or landowners of affected properties and the recipient(s) of the topsoil, the recipient(s) shall be required to use the topsoil for agricultural purposes. The project proponent(s) shall implement all terms and conditions of agreements.

(c) During project construction, use of utilities that are needed for agricultural purposes (including wells, pipelines, and power lines) and of agricultural drainage systems shall be minimized so that agricultural uses are not substantially disrupted.

(d) Disturbance of agricultural land and agricultural operations during construction shall be minimized by locating construction staging areas on sites that are fallow, that are already developed or disturbed, or that are to be discontinued for use as agricultural land, and by using existing roads to access construction areas to the extent possible.

(e) To the extent feasible, lands acquired for flood risk reduction purposes shall also be used as mitigation land for NBHCP programs so that agricultural land conversion is minimized.

Responsibility: Project proponent(s)

Timing: Minimize loss of Important Farmland and reuse topsoil before construction; and avoid disruption to current agricultural operations during construction

Implementing this mitigation measure would reduce the impact of permanent conversion of Important Farmland to habitat uses under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, but not to a less-than-significant level because no new farmland would be made available, and the productivity of existing farmland would not resume or be improved. Conservation of 1,660 acres of Important Farmland in the Elkhorn Basin of Yolo County across the Sacramento River from the Natomas Basin as described in Section 3.2, “Agricultural Resources,” would partially offset the permanent conversion of agricultural lands resulting from the Phase 4b Project. However, because no feasible mitigation is available to fully reduce the impact of permanent conversion of Important Farmland to flood risk reduction features and habitat uses, this impact would remain significant and unavoidable for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. (Similar)

Implementing this mitigation measure for borrow sites that are returned to agricultural use would reduce the impacts of temporary conversion of Important Farmland under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, but not to a less-than-significant level. Temporary conversion of Important Farmland for borrow use is considered a significant and unavoidable impact in the short term, but a less-than-significant impact in the long term because the topsoil layer to the site would be reclaimed. Reclamation thus would not adversely affect a site’s long-term agricultural productivity and, therefore, its status as Important Farmland under the FMMP would not be changed permanently. (Similar)

Impact 4.2-b: Conflict with Lands under Williamson Act Contracts

Table 4.2-2 summarizes and compares the project’s potential impacts on Williamson Act contracted lands.
### Table 4.2-2
Williamson Act Contracted Land Conversion – Phase 4b Project

<table>
<thead>
<tr>
<th>Project Component/Location</th>
<th>No-Action Alternative</th>
<th>Adjacent Levee Alternative (Proposed Action) (Acres in Active/ Nonrenewal)</th>
<th>Fix-In-Place Alternative (Acres in Active/ Nonrenewal)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Permanent Conversion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento River east levee (adjacent levee footprint, seepage berm, and O&amp;M/utility corridor)</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Natomas Cross Canal (Vestal Drain and Morrison Canal)</td>
<td>-</td>
<td>33.67/0 (^2)</td>
<td>33.67/0 (^2)</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal (maximum Phase 4b Project footprint increment; adding to 60 acres addressed in the Phase 3 EIS and EIR)</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Natomas East Main Drainage Canal North (limit of construction)</td>
<td>-</td>
<td>4.57/22.57</td>
<td>4.57/22.57</td>
</tr>
<tr>
<td>Riego Road Canal relocation</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>West Drainage Canal (maximum footprint)</td>
<td>-</td>
<td>3.97/0 (^3)</td>
<td>3.97/0 (^3)</td>
</tr>
<tr>
<td>Detention basins at Triangle Properties Borrow Area</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brookfield Borrow Site marsh conversion</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Permanent Conversion</strong></td>
<td>-</td>
<td>42.21/22.57</td>
<td>42.21/22.57</td>
</tr>
<tr>
<td><strong>Temporary Conversion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Fisherman’s Lake Borrow Area</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Triangle Properties Borrow Area (excluding detention basins)</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Temporary Conversion</strong> (^4)</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Notes:**

1. “Active” indicates the property is under contract and the nonrenewal process has not been initiated. “Nonrenewal” indicates that the property owner has filed for nonrenewal and the contract will expire 10 years after the process was initiated.
2. Lands under Williamson Act contract affected by the relocation of the Morrison Canal and Vestal Drain include 12.71 acres within the new alignments and 20.96 acres that are assumed to be unfarmable remnants created by the relocation of the canal and drain. It is assumed that the remnant properties would no longer meet the requirements for enrollment under the Williamson Act.
3. The existing West Drainage Canal would be filled in and would potentially be suitable for cultivation; however, the enrollment of any of the land in the Williamson Act would be at the discretion of the property owner.
4. Potential maximum if all borrow sites are excavated over entire acreage available.

Source: Data compiled by AECOM in 2009

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**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction activities associated with the Phase 4b Project would occur; therefore, no Williamson Act contracts would be terminated. There would be **no impact. (Lesser)**

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding in the Basin, would result in destruction of agricultural land. If flood damage prevented the continued use of contracted lands for agricultural use, the Williamson Act contract would
potentially be subject to nonrenewal or cancellation. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would affect properties under Williamson Act contract in and adjacent to the alignment of the relocated Vestal Drain, Morrison Canal, and West Drainage Canal, and along the widened levee of the NEMDC North. If the Phase 4b Project does not require acquisition of an entire parcel, the contract would be terminated only on the portion of the parcel required for the Phase 4b Project; the remainder of the parcel unaffected by the project would remain under contract. Table 4.2-2 shows the maximum acreage of lands under Williamson Act contract that would be taken out of contract. Additionally, woodland plantings could affect up to 32 additional acres of Williamson Act contract lands, depending upon the sites selected for woodland creation within the Natomas Basin.

The use of Williamson Act contracted lands as borrow sites would require cancellation of Williamson Act contracts. For lands that would be permanently converted to nonagricultural uses or acquired in fee by the project proponent, notice to DOC is required under the Act, as described under Mitigation Measure 4.2-b, below. Those contracted lands that would be returned to agricultural use, could potentially be reenrolled, providing compatibility standards contained in California Government Code Sections 51238–51238.3 are met.

The temporary and permanent cancellation of lands under Williamson Act contract for flood damage reduction features and borrow uses would be a significant impact.

Mitigation Measure 4.2-b: Minimize Impacts on Agricultural Preserve Land and Williamson Act–Contracted Land; Comply with California Government Code Sections 51290–51293; and Coordinate with Landowners and Agricultural Operators

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on under Williamson Act contracts, the project proponent(s) shall implement the measures described below.

(a) The project proponent(s) shall comply with California Government Code Sections 51290–51295 with regard to acquisition of Williamson Act contracted lands as follows:

- The policy of the state, consistent with the purpose of the Williamson Act to preserve and protect agricultural land, is to avoid, whenever practicable, locating public improvements and any public utilities improvements in agricultural preserves. If it is necessary to locate within a preserve, it shall be on land that is not under contract (California Government Code Section 51290[a][b]). More specifically, the basic requirements are:
  - Whenever it appears that land within a preserve or under contract may be required for a public improvement, the public agency or person shall notify the DOC and the city or county responsible for administering the preserve (California Government Code Section 51291[b]).
  - Within 30 days of being notified, DOC and the city or county shall forward comments, which shall be considered by the public agency or person (California Government Code Section 51291[b]).

- The contract shall be terminated when land is acquired by eminent domain or in lieu of eminent domain (California Government Code Section 51295).
► DOC and the city or county shall be notified before project completion of any proposed substantial changes to the public improvement (California Government Code Section 51291[d]).

► DOC shall be notified within 10 working days upon completion of the acquisition (California Government Code Section 51291[c]).

► If, after acquisition, the acquiring public agency determines that the property will not be used for the proposed public improvement, before returning the land to private ownership, DOC and the city or county administering the involved preserve shall be notified. The land shall be reenrolled in a new contract or encumbered by an enforceable restriction at least as restrictive as that provided by the Williamson Act (California Government Code Section 51295).

(b) The project proponent(s) shall coordinate with landowners and agricultural operators to sustain existing agricultural operations, at the landowners’ discretion, within the project area until the individual agricultural parcels are needed for project construction.

(c) Properties that were under Williamson Act contract prior to conversion for borrow use and that are owned or acquired by the project proponent(s) shall be reenrolled under Williamson Act contract upon reclamation to agricultural use.

Responsibility: Project proponent(s)

Timing: Comply with policies regarding the Williamson Act before and during construction; coordinate with landowners and agricultural operators before construction; and reenroll Williamson Act contracted-lands upon reclamation of borrow sites

Implementation of this mitigation measure would potentially reduce the impacts from temporary conversion of Williamson Act–contracted lands used as borrow sources under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, but not to a less-than-significant level, because the project proponent(s) has no regulatory authority over ensuring that parcels are reenrolled. No feasible mitigation is available to lessen or fully avoid the permanent loss of land under Williamson Act contracts converted to nonagricultural use within the flood damage reduction features footprint. For these reasons, this impact would remain significant and unavoidable. (Similar)

4.2.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative; impacts of permanent agricultural land loss due to levee failure would remain uncertain, depending on the location and number of levee breaches. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration.

The implementation of required mitigation measures would partially reduce the impacts of permanent and temporary conversion of Important Farmland to nonagricultural uses, temporary conversion of lands in Agricultural Preserves, and loss of lands under Williamson Act contracts; however, there is no feasible mitigation available that would fully reduce or avoid these losses. Therefore, residual significant and unavoidable impacts would occur under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.
4.3  LAND USE, SOCIOECONOMICS, AND POPULATION AND HOUSING

4.3.1  METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.3.1.1  METHODOLOGY

The Phase 4b Project was evaluated in the context of adopted land use plans and policies. State, regional, and local land use plans and policies contained in adopted planning documents pertaining to the Phase 4b Project site were reviewed, including the Sutter County General Plan (Sutter County 1996) and zoning code, Sacramento County General Plan (Sacramento County 1993) and zoning code, City of Sacramento 2030 General Plan (City of Sacramento 2009a), the Sacramento International Airport Master Plan (Airport Master Plan) (Sacramento County Airport System 2007), the Sacramento International Airport Land Use Compatibility Plan (ALUCP), the Natomas Basin Habitat Conservation Plan (NBHCP), and field review and consultation with appropriate agencies. SAFCA, acting as a joint powers authority pursuant to the Joint Exercise of Power Act (California Government Code 6500 et seq.) and the SAFCA Act (California Water Code App. Section 130-1 et seq.), must consider relevant Federal and state land use policies, but is immune from compliance with local laws, regulations, and ordinances. Although exempt, SAFCA has substantially complied with adopted regional and local plans, policies, and ordinances applicable to the NLIP. Nevertheless, this EIS/EIR provides relevant local plans and policies in order to describe the land use planning and policy context in which the project exists and how local agency plans and policies address resource issues in the NLIP area, including the Phase 4b Project area, and because if USACE implements the Phase 4b Project, USACE would be bound by all regional and local laws and regulations.

The Phase 4b Project was also evaluated for potential impacts related to socioeconomics (required under NEPA), population and housing using data from the 2000 U.S. Census, and a review of land use surveys of the Phase 4b Project area.

4.3.1.2  THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to land use, socioeconomics, and population and housing if they would do any of the following:

► conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental impact;

► conflict with any applicable habitat conservation plan or natural community conservation plan;

► physically divide an established community;

► displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or

► displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.
4.3.2 IMPACTS AND MITIGATION MEASURES

Impact 4.3-a: Inconsistency with Airport Master Plan, Airport Comprehensive Land Use Plan, and Airport Wildlife Hazard Management Plan

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly conflict with adopted Airport plans. This alternative would be consistent with adopted Airport plans. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. In the event that a major flood event affects Airport operations, the Sacramento County Board of Supervisors has approved a Continuity of Airport Operations Flood Contingency Plan that would transfer limited commercial transport operations to Mather Field (Sacramento County Board of Supervisors 2008). Consistency of the No-Action Alternative with the continued implementation of Airport plans would depend on the location of any future levee failure and the extent of subsequent flooding. Assuming that the Airport is still operational after levee failure, Airport north bufferlands could be temporarily altered from managed grassland and idle fields to marsh conditions, a land use considered to be incompatible near airports. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential inconsistency is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Sacramento International Airport Master Plan

The existing alignment of the West Drainage Canal is located on Airport property, and the proposed realignment is located on property that is planned for acquisition by the Airport as part of the Phase 1 (2007–2013) Airport Master Plan implementation. The Airport Master Plan does not include any planned improvements on the property where the West Drainage Canal would be realigned and the footprint of the proposed Phase 4b Project flood reduction facilities would not interfere with implementation of future phases of the Airport Master Plan. Implementation of the Phase 4b Project would be beneficial to completion of the Airport Master Plan because future Airport improvements would be dependent upon completion of flood damage reduction improvements for the Natomas Basin.

The Natomas Levee Class 1 Bike Trail Project is conceptual at this stage and no alignment has been selected; however, it is intended that the bike trail would generally follow the Natomas Basin perimeter levee system (Plate 2-19). If it is infeasible for the bike trail to be placed on the levee south of the Airport, then the bike trail alignment would potentially encroach upon Airport property adjacent to the levee. The Natomas Levee Class 1 Bike Trail Project is considered potentially inconsistent with the Airport Master Plan because of this potential encroachment. The final determination as to whether the Bike Trail would be an allowed use on Airport property would rest with the Airport Land Use Commission, SCAS, and the FAA.
Sacramento International Airport Land Use Compatibility Plan

The Airport Safety Zones (Overflight Zone and Approach-Departure Zone), defined by the Sacramento International Airport Land Use Compatibility Plan (ALUCP) (Sacramento Area Council of Governments [SACOG] 1994) and the Airport Perimeter B (the area within a 10,000-foot radius from the Airport Operations Area) shown in Plate 1-7, would overlap with the Phase 4b Project footprint, specifically with the proposed Natomas Levee Class 1 Bike Trail Project, West Drainage Canal realignment, and West Drainage Canal bank improvements.

As described above, the Natomas Levee Class 1 Bike Trail Project is conceptual at this stage and no alignment has been selected; however, it is intended that the bike trail would generally follow the Natomas Basin perimeter levee system (Plate 2-19). The Overflight Zone (Airport Perimeter B) would overlap with the proposed Natomas Levee Class I Bike Trail Project in Reach B–C:4A–11B and the Approach-Departure Zone would overlap with the Natomas Levee Bike Trail Project in Reach C:4A–4B and B:11A–11B of the Sacramento River east levee. The Approach-Departure Zone is the more restrictive zone with respect to compatible land uses. According to the ALUCP Land Use Compatibility Guidelines for Safety, some recreational uses are compatible in the Approach-Departure Zone, including golf courses, provided that the use does not result in a concentration of more than 25 persons per acre. While the Land Use Compatibility Guidelines for Safety consider streets, roads, and highways to be compatible in both Safety Zones, the Guidelines do not address bicycle paths or trails (SACOG 1994). The final determination of consistency with the ALUCP will be made by the Airport Land Use Commission based on the specific bike trail alignment selected. Because the proposed Natomas Levee Class I Bike Trail would intensify land use in an area where public safety is of critical concern to SCAS and the FAA, the Natomas Levee Class 1 Bike Trail Project is considered potentially inconsistent with the ALUCP.

Wildlife Hazard Management Plan

The Wildlife Hazards Management Plan notes that agricultural crops and open water are the primary wildlife attractants within the Airport Perimeter B; however, according to the ALUCP Land Use Compatibility Guidelines for Safety, field and row crops, open space and natural areas, and natural water areas would be compatible in the Approach-Departure Zone, provided the use does not present a bird hazard (SACOG 1994). (SCAS 2007). Realignment of the portion of the existing West Drainage Canal located immediately south of I-5, would move that portion of the canal farther from the Airport Operations Area; however, the realigned portion of the canal would remain in the Approach-Departure Zone and within Perimeter B. Additionally, the relocated alignment would be approximately 0.25-mile longer than the existing alignment, and slope flattening of the bank to a 3:1 slope and the creation of benches for planting of tules would increase open water within the Approach-Departure Zone and Airport Perimeter B. The increase in open water along with the creation of benches for planting of tules would potentially create additional habitat for hazardous wildlife. (See Impact 4.16-f, “Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport.”) The project proponent(s) would work with SCAS to design the relocated and improved West Drainage Canal to minimize new hazardous wildlife attractants; therefore, the Phase 4b Project would be consistent with the Wildlife Hazards Management Plan.

Impact Summary

The Phase 4b Project would be potentially inconsistent with the Airport Master Plan because the Natomas Levee Class 1 Bike Trail Project could potentially encroach upon Airport Property; and with the ALUCP because the Natomas Levee Class 1 Bike Trail Project would be a potentially incompatible land use within Airport Perimeter B and the Approach-Departure Zone. The Phase 4b Project would be consistent with the Wildlife Hazards Management Plan because the project proponent(s) would work with SCAS to ensure that the design of the relocated and improved West Drainage Canal does not result in a an increase in wildlife attractants. (Similar)
Mitigation Measure 4.3-a: Implement Mitigation Measure 4.16-g, “Consult with SCAS and the FAA during Design of the Proposed Natomas Levee Class I Bike Trail to Implement Appropriate Airport Safety Precautions”

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The Sacramento County Department of Transportation (SacDOT), Sutter County, and the City of Sacramento shall consult with SCAS and the FAA to ensure that the alignment of the Natomas Levee Class I Bike Trail is compatible with the Airport Master Plan and the ALUCP, and that applicable regulations and safety precautions are considered and built into construction of the proposed Natomas Levee Class I Bike Trail. These safety precautions shall include project elements that would reduce opportunities for hazards to the Airport and the public, and may include features such as fencing, increased security personnel, and special consideration of alignment and parking areas near the Airport. The Natomas Levee Class I Bike Trail shall not be opened for use until these elements are completed.

**Responsibility:** SacDOT, Sutter County, and the City of Sacramento

**Timing:** Before the start of construction of the proposed Natomas Levee Class I Bike Trail

SacDOT is responsible for implementing this mitigation measure, which would ensure compatibility of the bike trail with the Airport Master Plan and the ALUCP, and reduce the potential for the Natomas Levee Class I Bike Trail Project to pose an aircraft safety hazard. Site-specific (project-level) impacts of the bike trail would be assessed pursuant to CEQA requirements when the specific alignment has been selected and designed, separate from this EIS/EIR. Any such necessary environmental review would be completed before implementation of the bike trail. The proposed Natomas Levee Class I Bike Trail falls under the jurisdiction of Sacramento (SacDOT) and Sutter Counties and the City of Sacramento, and the final determination as to whether the bike trail would be an allowed use on Airport property would rest with the Airport Land Use Commission, SCAS, and the FAA. Therefore, neither USACE nor SAFCA, as the project proponent(s) would have control over the timing or implementation of the mitigation measure. Thus, this impact would remain significant and unavoidable.

(Similar)

**Impact 4.3-b: Inconsistency with the Natomas Basin Habitat Conservation Plan**

Consistency of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative with the NBHCP is summarized below. Refer to Impact 4.7-l in Section 4.7, “Biological Resources,” for a detailed discussion of the project’s potential physical direct and indirect impacts to biological resources related to implementation of the NBHCP.

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, without Phase 4b Project levee improvements, vegetation removal from the waterside of the levee would be required to conform to USACE guidance regarding levee encroachments, eliminating habitat for several species covered by the NBHCP, including Swainson’s hawk. This habitat supports the majority of Swainson’s hawk nest sites in the Natomas Basin. However, the NBHCP was put in place to promote biological conservation to compensate for habitat loss largely brought about by urban development in the Natomas Basin. Without flood risk reduction provided by the Phase 4b Project, restrictions would be placed on new urban development and remaining habitat would not be at risk for conversion due to development. For these reasons, the No-Action Alternative would not directly conflict with implementation of the NBHCP. This alternative would be generally consistent with the NBHCP. (Lesser)
Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. The Natomas Basin Conservancy’s (TNBC’s) reserve infrastructure would be subject to damage in the event of levee failure; however, the extent of such damage is uncertain. Without flood protection provided by the levee improvements, restrictions would be placed on new urban development and remaining habitat would not be at risk for conversion due to development. Because there would be no habitat loss due to urban development, implementation of this alternative would not directly conflict with the implementation of the NBHCP. Impacts of the No-Action Alternative on special-status species are addressed in Section 4.7, “Biological Resources.” This alternative would be generally consistent with the NBHCP. (Lesser)

Adjacent Levee Alternative (Proposed Action)

Plate 1-8 shows the location of TNBC lands. The Adjacent Levee Alternative (Proposed Action) could encroach onto 6.56 acres of TNBC reserves on the Bolen property located along the West Drainage Canal, and the Betts property located along the NEMDC North. The encroachment onto these properties could potentially threaten the viability of populations of certain covered species, reduce the effectiveness of the NBHCP’s conservation strategy, and adversely affect attainment of the goals and objectives of the NBHCP, which could jeopardize successful implementation of the NBHCP. The Adjacent Levee Alternative (Proposed Action) would not result in the development of land outside the NBHCP permit area, but it would result in land use conversions within the permit area. Land use conversion, however, would not cause a net loss in the habitat values provided by these lands for NBHCP-covered species in the Natomas Basin. Direct and indirect physical habitat impacts of the Adjacent Levee Alternative (Proposed Action) are described in Section 4.7, “Biological Resources.” Although there would be a temporary loss of woodlands in the Phase 4b Project area as the replacement woodland plantings mature within 10–15 years, the retention of the extensive mature waterside riparian woodlands coupled with the creation and preservation of landside woodlands would protect potential nesting habitat for special-status birds. Some Swainson’s hawk foraging habitat would be temporarily affected by the Phase 4b Project borrow activities; however, much of this would be returned to equivalent or higher-quality Swainson’s hawk foraging habitat following borrow activities with the exception of areas that would be converted to marsh or woodland habitat (see Section 2.2.2.4, “Borrow Sites,” and Impact 4.7-f, “Impacts on Swainson’s Hawk and Other Special-status Birds”).

Compensatory habitat creation included in the Phase 4b Project is also part of USACE’s and SAFCA’s overall programmatic conservation strategy for the NLIP that aims to reconfigure habitat and connective corridors in the Basin at a landscape scale to help achieve NBHCP objectives (see Section 2.3.4, “Habitat Creation and Management”). The collective elements of USACE’s and SAFCA’s conservation strategy would aid in NBHCP implementation and provide TNBC with an opportunity to improve its overall performance towards the goals of the NBHCP.

However, without proper implementation of habitat creation/preservation and creation of a management plan in consultation with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (DFG), the Adjacent Levee Alternative (Proposed Action) would have the potential to reduce the effectiveness of the NBHCP conservation strategy and adversely affect attainment of its goals and objectives. Thus, the Adjacent Levee Alternative (Proposed Action) would be potentially inconsistent with the intent of the NBHCP.

Fix-in-Place Alternative

Impacts to the successful implementation of the NBHCP associated with the Adjacent Levee Alternative (Proposed Action) would also occur under the Fix-in-Place Alternative, with the exception that under this alternative, there would also be extensive removal of riparian vegetation on the waterside of the Sacramento River east levee to conform to USACE guidance regarding levee encroachments. This habitat is used by a variety of
species covered by the NBHCP, and supports the majority of Swainson’s hawk nest sites in the Natomas Basin. As described under Impact 4.7-l in Section 4.7, “Biological Resources,” the impact of the loss of this vegetation on Swainson’s hawks would be significant and may not be fully mitigable. Impacts on nesting habitat for Swainson’s hawks in the near term (i.e., before compensation woodland plantings have matured sufficiently to provide replacement nesting habitat) could substantially affect the successful implementation of the NBHCP. Physical direct and indirect impacts of the Fix-in-Place Alternative on biological resources, and mitigation measures required to reduce those impacts, are addressed in Section 4.7, “Biological Resources.” The Fix-in-Place Alternative would be inconsistent with the NBHCP. (Greater)

Mitigation Measure 4.3-b: Implement Mitigation Measure 4.7-l, “Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h”

The project proponent(s) shall implement Mitigation Measure 4.7-l, “Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h,” set forth in Section 4.7, “Biological Resources.” In summary, this mitigation measure requires coordination with TNBC, USFWS, and DFG to identify and implement actions to ensure that the project’s small encroachment onto TNBC reserves does not jeopardize successful implementation of the NBHCP.

**Responsibility:** Project proponent(s)

**Timing:** Before the start of construction activities

With implementation of this mitigation measure, the Adjacent Levee Alternative (Proposed Action) would be consistent with the NBHCP because the referenced mitigation measures would minimize impacts to woodland habitats, jurisdictional waters, and special-status species; provide for habitat improvements for Swainson’s hawk and giant garter snake; and compensate for loss of habitat. Habitat improvements of the Phase 2, 3, and 4a Projects would minimize the Phase 4b Project’s adverse effects on landside woodland habitat because the amount of landside woodlands that would be created and preserved as part of the Phase 2, 3, and 4a Projects along with the Phase 4b Project would result in an increase of landside woodlands in the Natomas Basin.

Under the Fix-in-Place Alternative, these replacement woodlands would not be adequate to compensate for the extensive loss of mature waterside vegetation and would not compensate for loss of SRA habitat along the NEMDC and Sacramento River east levee Reach A:16–20. Therefore, the Fix-in-Place Alternative would remain inconsistent with the NBHCP. This impact would be significant and unavoidable. (Greater)

Impact 4.3-c: Inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur. However, compliance with USACE levee vegetation guidance would be required. Under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted, up to six acres of waterside woodlands would be cleared on the upper two-thirds of the levee, adjacent to the Parkway. This vegetation removal would be potentially inconsistent with Parkway policies for uses adjacent to the Parkway that serve to ensure that adjacent uses are sensitive to the Parkway’s naturalistic setting and scenic values, and protect the Parkway from negative visual impacts. Physical impacts (as well as mitigation measures to help reduce those impacts) associated with vegetation removal are discussed in Sections 4.7, “Biological Resources,” and 4.14, “Visual Resources.”
Additionally, Parkway Plan Policy 4.9, copied below, would not be met if the Phase 4b Project is not constructed:

Flood management agencies should continue to maintain, and improve when required, the reliability of the existing public flood-control system along the lower American River to meet the need to provide a high level of flood protection to the heavily urbanized floodplain along the lower American River consistent with other major urban areas. This effort is expected to include raising and strengthening the levees as necessary to safely contain very high flow in the river (up to 160,000 cubic feet per second) for a sustained period.

As noted above, compliance with USACE levee vegetation guidance would be required under the No-Action Alternative, and could result in up to six acres of waterside woodlands being cleared on the upper two-thirds of the levee, adjacent to the Parkway (under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted). This vegetation removal could affect the American River’s classification under the Wild and Scenic Rivers Act. The determination of consistency with the Wild and Scenic Rivers Act rests with the National Park Service, the Federal agency responsible to ensure that the protections under Section 7(a) of the Federal Wild and Scenic Rivers Act are consistently applied on rivers classified as wild and scenic. A consistency determination would need to be requested from the National Parks Service as to whether compliance with USACE’s levee vegetation guidance would adversely affect the characteristics qualifying the American River for the national system as required under Section 7(a) of the Wild and Scenic Rivers Act.

Therefore, this alternative would be potentially inconsistent with the Parkway Plan and the Wild and Scenic Rivers Act. (Greater)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee breach along the American River north levee would potentially cause scour damage to the Parkway from the force of the outrushing water. Parkway infrastructure would also be subject to damage in the event of a levee failure; however, the extent of such damage is uncertain. Nonetheless, is it assumed that the Parkway would suffer damage during a levee failure and many of the Parkway Plan’s policies would be violated. Similarly, in the event of a levee failure, the classification of the American River under the Wild and Scenic Rivers Act could be jeopardized depending on the magnitude of the event and the resulting damages. A precise determination of consistency is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential inconsistency is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

American River Parkway Plan

Under the Phase 4b Project, no waterside vegetation would be removed from within the Parkway to construct improvements to the American River north levee. Further, construction of cutoff walls and levee slope flattening under the Phase 4b Project would not encroach upon the Parkway. Nonetheless, the Phase 4b Project would be subject to USACE’s levee vegetation guidance, which would require the removal of vegetation on the upper two-thirds of the levee, adjacent to the American River Parkway. SAFCA is requesting a variance from this guidance; however, under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted, up to six acres of waterside woodlands would be cleared on the upper two-thirds of the levee, adjacent to the Parkway. This vegetation removal would be potentially inconsistent with Parkway policies for uses adjacent to the Parkway that serve to ensure that adjacent uses are sensitive to the Parkway’s naturalistic setting and scenic values, and protect the Parkway from negative visual impacts. Physical impacts associated with vegetation removal are discussed in Sections 4.7, “Biological Resources,” and 4.14, “Visual Resources.” It should be noted
that compliance with USACE levee vegetation guidance would be required whether or not the Phase 4b Project is approved (hence, the inclusion of this same discussion under the No-Action Alternative).

The Parkway Plan policies also address flood risk reduction and levee protection policies. The Phase 4b Project is consistent with the majority of the land use management, flood risk reduction, and levee protection policies of the American River Parkway Plan. These policies require that flood management agencies maintain and improve the existing flood control system, and manage vegetation in the Parkway to maintain the structural integrity and conveyance capacity of the flood control system, consistent with the need to provide a high level of flood risk deduction (Sacramento County 2008:4-84). In particular, American River Parkway Plan Flood Control Policy 4.10 states:

Flood control projects, including levee protection projects and vegetation removal for flood control purposes, shall be designed to avoid or minimize adverse impacts on the Parkway, including impacts to wildlife and wildlife corridors. To the extent that adverse impacts are unavoidable, appropriate feasible compensatory mitigation shall be part of the project. Such mitigation should be close to the site of the adverse impact, unless such mitigation creates other undesirable impacts.

The project proponent(s) would comply with the above policy by (1) designing the project to avoid or minimize adverse impacts on the Parkway; (2) to the extent that adverse impacts are unavoidable, incorporating appropriate feasible compensatory mitigation into the project; and (3) locating such mitigation close to the site of the adverse impact, to the extent feasible. (See Sections 4.7, “Biological Resources,” and 4.14, “Visual Resources,” for a description of impacts and required compensatory mitigation.)

Wild and Scenic Rivers Act

It should be noted that compliance with USACE levee vegetation guidance would be required whether or not the Phase 4b Project is approved (hence, the inclusion of this same discussion under the No-Action Alternative). The Phase 4b Project would not be expected to alter the American River’s classification under the Wild and Scenic Rivers Act because no waterside vegetation would be removed along the American River to construct levee improvements, and construction of cutoff walls and levee slope flattening under the Phase 4b Project would not encroach upon the American River or the Parkway.

Impact Summary

The Phase 4b Project would be consistent with the American River Parkway Plan because the project design would adhere to the Parkway Plan policies. However, should USACE require removal of waterside vegetation from the American River north levee, the Phase 4b Project would be potentially inconsistent with the Parkway Plan, as described for the No-Action Alternative. (Similar) (See Section 4.7, “Biological Resources,” and Section 4.14, “Visual Resources,” for the physical impacts that would result from vegetation removal, and the accompanying mitigation measures to help reduce these impacts.)

The Phase 4b Project would be consistent with the Wild and Scenic Rivers Act because the Phase 4b Project would not be expected to alter the American River’s classification under the Wild and Scenic Rivers Act. However, should USACE require removal of waterside vegetation from the American River north levee, the Phase 4b Project would be potentially inconsistent with the Wild and Scenic Rivers Act, as described for the No Action Alternative. (Similar)

Mitigation Measure: No mitigation is available.
Impact 4.3-d: Potential to Physically Divide or Disrupt an Established Community

Table 4.3-1 shows the property acquisitions that would occur under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative.

<table>
<thead>
<tr>
<th>Project Element/Location</th>
<th>Adjacent Levee Alternative (Proposed Action)</th>
<th>Fix-in-Place Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacramento River east levee Reaches B: 15 and A:16–18B</td>
<td>6 property relocations</td>
<td>None</td>
</tr>
<tr>
<td>Sacramento River east levee Reach A:19A–20</td>
<td>1 property relocation</td>
<td>None</td>
</tr>
<tr>
<td>American River north levee Reach I:1–4</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>PGCC west levee (Reach E)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>NEMDC North (Reaches F–G)</td>
<td>14 property relocations/demolitions</td>
<td>5–10 property relocations/demolitions</td>
</tr>
<tr>
<td>NEMDC South (Reach H)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Morrison Irrigation Canal relocation (NCC Reach D area)</td>
<td>3 property relocations along the NCC</td>
<td>3 property relocations along the NCC</td>
</tr>
<tr>
<td>West Drainage Canal realignment (in Sacramento River east levee Reach B)</td>
<td>1 mobile home relocation</td>
<td>1 mobile home relocation</td>
</tr>
<tr>
<td>Triangle Properties, South Fisherman’s Lake, and West Lakeside borrow areas</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25 property relocations/demolitions</strong></td>
<td><strong>9–14 property relocations/demolitions</strong></td>
</tr>
</tbody>
</table>

Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal

1 As of this writing, USACE had not yet inventoried whether the properties in this table are residences or businesses.

Source: Data provided by USACE in 2010

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to divide or disrupt an established community. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Levee failure would have the potential to destroy residences located on or adjacent to the levee, and to isolate residents from nearby communities. The magnitude of the impact cannot be predicted and would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)
Adjacent Levee Alternative (Proposed Action)

The project’s potential to physically divide or disrupt an established community relates to the physical division of a community and also the socioeconomic impact of permanently removing existing residences, businesses, and associated structures to accommodate the Phase 4b Project. Additionally, project construction and resulting temporary road closures and detours would temporarily disrupt the community by limiting access to residences and businesses during construction.

Permanent Community Disruption as a Result of Property Acquisition

Design of the Phase 4b Project includes measures to reduce project footprint impacts to residences and businesses, to the extent feasible given levee design and seepage remediation performance requirements. Nonetheless, along the Sacramento River east levee Reaches B:15 and A:16–20, construction of the proposed adjacent levee, seepage berm, and O&M and utility corridors would require removing properties on the landside of the levee (see Table 4.3-1). In Reaches B:15 and A:16–18B, some of these properties are on large lots and widely spaced, while others are in closer proximity to neighboring properties; in Reach A:19A–20, properties are located within subdivisions north of the levee.

Along the west levee of NEMDC North, several properties may be removed/demolished, depending upon final engineering design. The relocation of the Morrison Irrigation Canal, south of the NCC south levee, may require removal of several properties. Additionally, one mobile home located on the south side of the West Drainage Canal at Powerline Road may require relocation. Residences in these areas are widely scattered and generally associated with farm complexes.

No properties would be removed within the project footprint along the American River north levee Reach I:1–4, PGCC west levee (Reach E), or NEMDC South (Reach H).

A number of residences, farm complexes, and other non-agricultural land uses are located within the approximately 1,809-acre Triangle Properties Borrow Area. Excavation of borrow material would occur on approximately 290 acres within the Triangle Properties Borrow Area, and no demolition of residences or other non-agricultural uses would occur as part of borrow excavation. Excavation sites within the Triangle Properties Borrow Area would be set back at least 100 feet from existing roads, utilities, and irrigation ditches. No residences or businesses are located within the South Fisherman’s Lake or the West Lakeside borrow areas; therefore, there would be no impact related to community division at these borrow areas.

All property acquisitions would be conducted in compliance with Federal and state relocation law, and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 United States Code [USC] Section 4601 et seq.), and implementing regulation, 49 Code of Federal Regulations [CFR] Part 24; and California Government Code Section 7267 et seq., California Code of Civil Procedure Sections 1263.010 to 1263.620 and 1255.010 to 1255.060, California Community and Housing Development Title 25, and State and Caltrans Right-of-Way Manual, Chapter 10. These laws require that appropriate compensation be provided to displaced residential and nonresidential landowners and tenants, and that residents be relocated to comparable replacement housing and receive relocation assistance. This law applies to residential relocations as well as farms and businesses if they would be displaced for any length of time. Refer to Section 3.3, “Land Use, Socioeconomics, and Population and Housing,” and Chapter 6, “Compliance with Federal Environmental Laws and Regulations,” for more details regarding these regulations.

In summary, implementation of the Phase 4b Project would require a number of property acquisitions, some of which are in established communities and others of which may not be (due to widely scattered residences in mostly rural areas). Regardless of the extent to which these communities are “established,” the project’s removal
of residences and businesses would disrupt, but would not physically divide, these communities. This impact would be significant.

**Temporary Community Disruption as a Result of Construction-Related Traffic Impacts**

Temporary disruption to the community would occur during construction of the Phase 4b Project. Portions of the Phase 4b Project area are located immediately adjacent to the established communities of North and South Natomas, within the City of Sacramento, as well as neighborhood communities along Garden Highway and the Valley View Acres community along the NEMDC. Garden Highway provides primary access to the waterside and landside residences and businesses located along the Sacramento River east levee. Some landside residences and at least one business located along the American River north levee also use Garden Highway for their primary access.

Landside impacts, specifically the installation of a cutoff wall, in the Valley View Acres community, located along the west levee of NEMDC South, were described in the Phase 3 EIS and EIR. Under the Phase 4b Project, proposed work in this community would be limited to waterside erosion control, which would not affect residences because all construction would take place on the waterside of the levee. Thus, the Phase 4b Project would not result in community disruption in the Valley View Acres community.

In Reach A:16–19A of the Sacramento River east levee, approximately 39 residences and one business are located on the waterside of the levee and use Garden Highway for access; the driveways of these residences and businesses would remain usable during construction. An apartment complex located on the landside of the levee in Reach A:20 has access from Garden Highway; however, alternate access is available to the apartments from streets to the north.

Approximately six residences are located on the landside of the levee and use Garden Highway for access; the driveways of these residences would be closed during construction. In Reach A:19B–20, approximately 11 residences, a 207-unit condominium complex, and approximately nine businesses are located on the waterside of the levee that use Garden Highway for access. One landside business in Reach A:20 relies on Garden Highway for access. The landside business does not have alternative access; however, a temporary alternative access may be feasible to construct. If alternate access cannot be provided for these residences and businesses that use Garden Highway for access, it may be necessary for residents to relocate for the duration of the construction period, and businesses may need to relocate or suspend business operations for the duration of construction.

The landside lane of Garden Highway would be closed for up to 6 months during project construction to allow for installation of a cutoff wall. The closed portion of Garden Highway would shift along the levee crown as the cutoff wall is installed. In addition, because there may be insufficient room for a two-way haul route at the toe of the existing levee in Reach A:19B–20, the waterside lane of Garden Highway may be used by haul trucks delivering materials to the project sites. This lane would only be open to local traffic, with use of traffic controls. Through-traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. In addition to the closure for cutoff wall construction, Garden Highway would also be closed at several locations, including at the City of Sacramento Sump Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B, to allow for installation of pipes that need to be raised.

This closure of Garden Highway to through-traffic, although temporary, would cause traffic delays for residents traveling to and from North and South Natomas and the vicinity, and in making connections with I-5 and other major travel routes. Businesses such as restaurants, marinas, and boat repair services that use Garden Highway for access could experience reduced activity due to traffic delays, loss of roadside parking, and construction-generated noise and dust. Loss of business activity may result in business relocations or closures, either temporary or permanent. Customers would likely seek out similar businesses in other unaffected areas of Natomas Basin when access to Garden Highway businesses is limited or precluded.
The Garden Highway/Arden-Garden Connector located on the crown of the American River north levee between I-5 and Northgate Boulevard would be closed for up to 6 months to accommodate levee work and modifications to City of Sacramento Sump Pump 58. Through-traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. Along the American River north levee Reach 1:1–4, approximately four residences use Garden Highway for access. These affected residents would be required to temporarily relocate if alternate access could not be provided. The altered traffic pattern resulting from the detour around the construction area may have an effect on nearby businesses that would experience a decrease in business activity as a result of reduced drive-by traffic.

In the Triangle Properties Borrow Area, temporary, traffic-related disruptions to residents in the area would occur for the duration of project construction as a result of borrow excavation and hauling in this area. Residences and associated structures would not be removed; however, borrow activities would expose residents to noise, and haul truck traffic could result in dust and delay access in and out of their properties. Borrow activities would temporarily suspend agricultural activities in the portions of the borrow area being excavated. The farming operation may experience loss of economic activity due to the reduced area available for cultivation. No residences or businesses are located within the South Fisherman’s Lake Borrow Area or the West Lakeside Borrow Site, thus there would be no requirement for relocations; however, current agricultural operations would be suspended during borrow activities, as described above.

Construction activities along the Sacramento River east levee and American River north levee would cause temporary access disruptions for residents and businesses along Garden Highway, the Garden Highway/Arden-Garden Connector, and within the Triangle Borrow Area; borrow excavation would cause temporary disruption to agricultural operations in the Triangle Borrow Area and the Fisherman’s Lake Borrow Area. This would be a significant impact.

Fix-in-Place Alternative

**Permanent Community Disruption as a Result of Property Acquisition**

This alternative would require construction of a landside seepage berm and flattening of the landside levee; the width of the project footprint on the Sacramento River east levee would be approximately 15 feet narrower than the Adjacent Levee Alternative’s (Proposed Action’s) footprint in most reaches. In Reach A:19A–19B, the levee footprint would be 23–73 feet narrower than the Adjacent Levee Alternative’s (Proposed Action’s) footprint.

As shown in Table 4.3-1, the Fix-in-Place Alternative would result in the removal of fewer residences than would occur with the Adjacent Levee Alternative (Proposed Action). Property relocations/demolitions under this alternative would be limited to the west levee of NEMDC North (Reaches F–G), the Morrison Irrigation Canal relocation (in the NCC Reach D area), and the West Drainage Canal realignment (in Sacramento River east levee Reach B). All property acquisition would be conducted in compliance with Federal and state relocation law, and relocation services would be accomplished in accordance with the regulations cited under the Adjacent Levee Alternative (Proposed Action).

In summary, implementation of the Fix-in-Place Alternative would require a number of property acquisitions, some of which are in established communities and others of which may not be (due to widely scattered residences in mostly rural areas). Regardless of the extent to which these communities are “established,” removal of residences and businesses would disrupt, but would not physically divide, these communities. This impact would be significant. *(Lesser)*

**Temporary Community Disruption as a Result of Construction-Related Traffic Impacts**

Under the Fix-in-Place Alternative, temporary effects of construction, including construction-related traffic impacts, would be similar to the Adjacent Levee Alternative (Proposed Action), and the same businesses and
residences would be affected. However, raising the levee and constructing cutoff walls in the existing levee would require full closure of both lanes of Garden Highway in approximately 1,000-foot-long segments that would move along the levee as construction of each segment is completed. This closure would extend for the duration of the construction season—up to 6 months. Local access for residents and businesses along the Sacramento River east levee in this area would be provided, while through-traffic would be detoured around the construction. Businesses such as restaurants, marinas, and boat repair services that use the Garden Highway for access could experience reduced activity due to traffic delays, loss of roadside parking, and construction; however, loss of business activity may result in closures or relocations, either temporary or permanent. Business customers would likely seek out similar businesses in other unaffected areas of Natomas Basin when access to Garden Highway businesses is limited or precluded.

Impacts along the American River north levee, NEMDC North, NCC, PGCC, and in the Triangle Borrow Area would be the same as described under the Adjacent Levee Alternative (Proposed Action).

Temporary disruptions to access for residents and businesses along Garden Highway and the Garden Highway/Arden-Garden Connector would be a significant impact. (Greater)

Mitigation Measure 4.3-d: Notify Residents and Businesses of Project Construction and Road Closure Schedules; and Implement Mitigation Measures 4.10-a, “Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips,” and 4.10-c, “Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers”

The project proponent(s) and its primary contractors for engineering design and construction shall implement Mitigation Measures 4.10-a, “Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips,” and 4.10-c, “Notify Emergency Service Providers about Project Construction and Maintain Emergency Access or Coordinate Detours with Providers,” set forth in full in Section 4.10, “Transportation and Circulation.” Additionally, the following measures shall be implemented; notations are provided to indicate where measures differ depending upon whether the project is implemented by USACE or SAFCA:

a) Provide residents and business owners located adjacent to the construction areas with information regarding construction activities (including road closures, detour information, contact information, and complaint procedures) and a construction timeline, and post the construction schedule on the project proponent’s Web site. The schedule shall be updated on a regular basis.

b) Apply the following measures to power line relocations: To the extent that the main electrical power transmission lines and poles serving Garden Highway must be relocated or replaced to accommodate the project, the relocation or replacement shall occur east of the new adjacent levee and in a manner that appropriately accommodates private landside improvements and properties. Existing main electrical power transmission lines and poles on the waterside of the existing Garden Highway levee that do not need to be relocated or replaced to accommodate the project may be left in place. The project proponent(s) will avoid placing utilities on the waterside of the Garden Highway levee, where feasible. Consistent with sound engineering practices that prioritize the following, individual services shall: (1) use existing configurations and facilities, and (2) place any new poles on the landside of Garden Highway, subject to the approval of the Central Valley Flood Protection Board (CVFPB) and any other relevant regulatory public agencies and utility companies. USACE would also need to approve the implementation of this measure if SAFCA implements the project.
c) Implement the following measures before and during construction:

**Project Implementation by either USACE or SAFCA**

► Provide local residents and businesses with a timeline for the phased completion of the project that indicates the role of the various agencies involved in implementing or permitting the project. The project proponent(s) shall post the construction schedule for the project on the project proponent’s Web site. The schedule shall be updated on a monthly basis. In addition, the project proponent(s) shall post a “60-day notice” of planned construction on the project proponent’s Web site. “Planned construction” shall not include construction in the event of an emergency or construction necessary to remedy a condition discovered after completion of the project. However, the project proponent(s) shall provide whatever notice is possible under the circumstances to affected, adjacent landowners prior to any emergency or remedial work.

**Project Implementation by USACE**

► USACE shall conduct a free preconstruction inspection of the property, but only if requested by the affected property owner. The scope of the inspection and documentation shall be determined by project proponent in consultation with the property owner. For property owners who request prior inspections/documentation, the inspection/documentation must be scheduled prior to the start of construction within the specified reach of the Sacramento River east levee where project construction will commence.

► USACE shall require the contractor(s) to follow the construction specifications, which will include all USACE safety regulations.

**Project Implementation by SAFCA**

► SAFCA shall give property owners within the project area an informational package advising the property owners that pre-project inspections of their properties are important and that project proponent will conduct a free preconstruction inspection of the property, but only if requested by the affected property owner. The scope of the inspection and documentation shall be determined by SAFCA in consultation with the property owner. For property owners who request prior inspections/documentation, the inspection/documentation must be scheduled prior to the start of construction within the specified reach of the Sacramento River east levee where project construction will commence.

► If requested by a property owner within the project area, SAFCA shall test the owner’s domestic well water before and after project construction for the presence of bentonite, concrete, and cement.

► SAFCA shall cooperate with a construction monitoring committee established by local residents and businesses to resolve reasonable complaints regarding the project proponent’s or its contractors’ construction activities in accordance with this provision. A complaint procedure and hierarchy shall be developed by the committee and the project proponent’s Ombudsperson in time to be included in the informational packet referenced in subsection (i), above. In addition, the information packet shall include project proponent’s instructions to its contractors regarding appropriate use of Garden Highway. The project proponent(s) shall resolve all complaints pertaining to dangerous activities immediately, and shall resolve all other reasonable complaints in
an expeditious manner.

- SAFCA shall prohibit the use of earth-moving equipment or haul trucks on Garden Highway in conjunction with project construction to the extent feasible.

d) Where a property owner occupies a residence on property to be acquired for the project, SAFCA, as the local sponsor, shall allow up to 12 months, rather than the statutory allowance of 3 months, for the owner to relocate off the property. The 12-month period shall be counted from the first written offer.

e) Provide notice as feasible for emergency construction or remedial construction.

f) Provide assistance for residents and businesses that are required to relocate during the construction period. The project proponent(s) shall compensate residents for reasonable rent and living expenses incurred due to relocation. Residents will have the right to decent, safe, and sanitary housing in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act.

g) Provide 24-hour security patrols for residences and businesses that must be vacated during the construction period.

**Responsibility:** Project proponent(s)

**Timing:** Before and during the start of construction activities

Implementing these mitigation measures would reduce impacts resulting from temporary community division caused by planned road closures, but not to a less-than-significant level. Because no feasible mitigation measures are available to fully reduce this impact to a less-than-significant level, this impact would remain **significant and unavoidable** under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Because of the full closure of the Garden Highway, impacts under the Fix-in-Place Alternative would be more severe. *(Greater)*

There are no feasible mitigation measures available to fully reduce impacts related to community disruption as a result of removing residences and businesses to a less-than-significant level. This impact would therefore remain **significant and unavoidable** under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Because of the fewer number of residences and businesses that would need to be removed, impacts under the Fix-in-Place Alternative would be slightly reduced compared to the Adjacent Levee Alternative (Proposed Action). *(Lesser)*

**Impact 4.3-e: Displacement of Residences and Businesses**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to displace existing housing or people. There would be **no impact. (Lesser)**

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Levee failure would have the potential to destroy residences located on or adjacent to the levee, and to require relocation of residents to nearby communities. The magnitude of the impact cannot be
predicted and would depend upon the location of the levee breach, severity of the storm, and river flows at the
time of flooding. Therefore, a precise determination of significance is not possible and cannot be made. Because
of this uncertainty, this potential impact is considered too speculative for meaningful consideration. *(Currently
Unknown)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

Project implementation would require removal of residences and business as shown in Table 4.3-1.

As noted in Chapter 3, “Affected Environment,” the project vicinity has housing stock available for sale and rent. The 2000 Census data indicate that the average vacancy rate for Census Tracts in North Natomas was 12.2% and in South Natomas was 7.0%; and 2007 showed the average rental vacancy rate for North Natomas was 7.0% and for South Natomas was 5.2%. *(City of Sacramento 2009b: 5-6)*. Vacancy rates for the Census Tracts adjacent to the Sacramento River east levee were as high as 18.9%, much higher than the overall rate for South Natomas. Additionally, the downturn in the housing market has resulted in additional inventory of for-sale homes in the area *(Long 2008)*.

The project proponent(s) would minimize the project footprint to avoid residences to the extent feasible (see Chapter 2, “Alternatives”), and all relocations of residents would be conducted in compliance with Federal and state relocation law. Acquisition and relocation services would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC Section 4601 et seq.), and implementing regulation, 49 CFR Part 24; and California Government Code Section 7267 et seq., California Code of Civil Procedure Sections 1263.010 to 1263.620 and 1255.010 to 1255.060, California Community and Housing Development Title 25, and State and Caltrans Right-of-Way Manual, Chapter 10. These laws require that appropriate compensation be provided to displaced residential and nonresidential landowners and tenants, and that residents be relocated to comparable replacement housing and receive relocation assistance. This law applies to residential relocations as well as farms and businesses if they would be displaced for any length of time. Refer to Section 3.3, “Land Use, Socioeconomics, and Population and Housing,” and Chapter 6, “Compliance with Federal Environmental Laws and Regulations,” for more details regarding these regulations.

The existing housing stock in the project vicinity has sufficient available and comparable housing for rent and purchase to accommodate displaced residents. Therefore, no new construction of replacement housing would be required to accommodate the relocation of residents and impacts related to housing displacement and relocation of residents are considered less than significant. *(Similar)*

**Mitigation Measure: No mitigation is required.**

### 4.3.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, there would be no direct conflict with implementation of adopted Airport plans. In the event of a levee failure, continued implementation of Airport plans would depend on the location of any future levee failure and the extent of subsequent flooding; therefore, consistency with Airport plans is considered too speculative for meaningful consideration under the potential levee failure scenario.

After mitigation, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would be consistent with the ALUCP and the *Wildlife Hazards Management Plan*, but would remain inconsistent with the Airport Master Plan because the Natomas Levee Class 1 Bike Trail Project could potentially encroach upon Airport Property, and Mitigation Measure 4.3-a(1) would be the responsibility of SacDOT and, therefore, outside the project proponent’s control. This impact would remain significant and unavoidable.

The No-Action Alternative and Adjacent Levee Alternative (Proposed Action) would be consistent with the NBHCP; however, under the Fix-in-Place Alternative, because of the likely loss of a substantial amount of
nesting habitat for Swainson’s hawk, this alternative would remain potentially inconsistent with the NBHCP following mitigation.

Under the No-Action Alternative, compliance with USACE levee vegetation guidance would be required and could result in up to six acres of waterside woodlands being cleared on the upper two-thirds of the levee, adjacent to the Parkway (under a worst-case scenario in which a variance from USACE levee vegetation guidance were not granted). This vegetation removal would render the No-Action Alternative potentially inconsistent with the American River Parkway Plan and Wild and Scenic Rivers Act. Because mitigation cannot be required for the No-Action Alternative, this impact would remain significant and unavoidable. In the event of a levee failure, continued implementation of the American River Parkway Plan and the American River’s designation under the Wild and Scenic Rivers Act would depend on the location of any future levee failure and the extent of subsequent flooding; therefore, consistency with the American River Parkway Plan and Wild and Scenic Rivers Act is considered too speculative for meaningful consideration under the potential levee failure scenario.

The Phase 4b Project would be consistent with the American River Parkway Plan; however, should USACE require removal of waterside vegetation from the adjacent American River north levee, the Phase 4b Project would be potentially inconsistent with the Parkway Plan. (See Section 4.7, “Biological Resources,” and Section 4.14, “Visual Resources,” for the physical impacts that would result from vegetation removal, and the accompanying mitigation measures to help reduce these impacts.) This impact would remain significant and unavoidable.

Under the No-Action Alternative Potential Levee Failure scenario, potential impacts due to community disruption and displacement of residences and businesses are considered too speculative for meaningful consideration, given the uncertainties involved as a result of a levee failure.

The Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would temporarily disrupt established communities in the Phase 4b Project by restricting access to residences and businesses during construction. Even with mitigation, this impact would remain significant and unavoidable because no feasible mitigation measures are available to fully reduce this impact to a less-than-significant level. This impact would be greater for the Fix-in-Place Alternative because, under this alternative, sections of Garden Highway would be fully closed for extended periods of time. Similarly, there are no feasible mitigation measures available to fully reduce impacts related to community disruption as a result of removing residences and businesses to a less-than-significant level. This impact would therefore remain significant and unavoidable under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Because fewer residences and businesses would need to be removed, impacts under the Fix-in-Place Alternative would be slightly reduced compared to the Adjacent Levee Alternative (Proposed Action).

No residual impacts would remain concerning the displacement of residences and businesses under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.
4.4 GEOLOGY, SOILS, AND MINERAL RESOURCES

4.4.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.4.1.1 METHODOLOGY

This section addresses issues related to geologic hazards, specifically seismicity and soil erosion, soils, and mineral resources. Impacts associated with geology, soils, and mineral resources that could result from project-related activities were evaluated based on expected construction practices, materials used to construct the proposed improvements, general locations of improvements, and the nature of proposed operations.

This analysis relies on review of the Soil Survey of Sutter County, California (NRCS 1988), the Soil Survey of Sacramento County (NRCS 1993), Mineral Land Classification: Portland Cement Concrete-Grade Aggregate and Kaolin Clay Resources in Sacramento County, California (Dupras 1999), as well as published geologic maps and literature.

4.4.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) and alternatives under consideration were determined to result in a significant impact related to geology, soils, and mineral resources if they would do any of the following:

- expose people or structures to potential substantial adverse impacts, including risk of loss, injury, or death through the rupture of a known earthquake fault, strong seismic shaking, seismic-related ground failure, soil liquefaction, or landslides;
- result in substantial soil erosion or the loss of topsoil;
- locate project facilities on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed action, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- locate project facilities on expansive soil, creating substantial risks to property;
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- create a substantial flooding risk as a result of a seismic seiche;
- destroy a unique geologic feature;
- result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Because the project area is not located within an Alquist-Priolo Earthquake Fault Zone, fault ground rupture is highly unlikely and, therefore, this issue is not addressed further in this EIS/EIR.
All levee and canal improvements and borrow site excavation and reclamation would be designed based on the results of detailed geotechnical engineering studies performed previously (summarized in Kleinfelder 2008) and would be required to comply with standard engineering practices for levee design. The Central Valley Flood Protection Board’s (CVFPB’s) standards are the primary state standards applicable to the proposed levee improvements; these are stated in Title 23, Division 1, Article 8, Sections 111–137 of the California Code of Regulations. CVFPB’s standards direct that levee design and construction be in accordance with USACE’s Engineering Design and Construction of Levees (USACE 2000), the primary Federal standards applicable to levee improvements. Because the design, construction, and maintenance of levee improvements must comply with the regulatory standards of USACE and CVFPB, it is assumed that the design and construction of all levee modifications under the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would meet or exceed applicable design standards for static and dynamic stability, seismic ground shaking, liquefaction, subsidence, and seepage.

Because the project area is relatively flat, there would be no adverse impacts related to landslides. Therefore, this issue is not addressed further in this EIS/EIR.

Because the project would not involve the use of wastewater disposal systems of any kind, there would be no impact related to the ability of project area soils to support the use of septic systems. Therefore, this issue is not addressed further in this EIS/EIR.

While a seiche in the project area could be damaging, the risk of seiches is low, given the distance from active faults and the anticipated short duration of any seismic ground shaking in the area. Therefore, this issue is not addressed further in this EIS/EIR.

There are no unique geologic features in the project area. Therefore, the project would not destroy such features, and this issue is not discussed further in this EIS/EIR.

4.4.2 IMPACTS AND MITIGATION MEASURES

Impact 4.4-a: Potential Temporary Localized Soil Erosion during Construction

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for construction-related soil erosion. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of the flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Any levee failures would likely result in soil scouring and permanent loss of topsoil in localized areas within several hundred feet of a levee breach. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Therefore, a precise determination of significance is not possible and cannot be made. This impact could be offset by soil deposition resulting from inundation of the Natomas Basin by sediment-laden flood waters. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)
Implementation of the Phase 4b Project would include a substantial amount of construction activity along the Sacramento River east levee Reach A:16–20, the American River north levee Reach I:1–4, the northern portion of the NEMDC west levee from just south of Elkhorn Boulevard to Sankey Road, the PGCC west levee, the NCC south levee, at the Brookfield borrow site (conversion to managed marsh), at the Chappell Ditch and Drain, at the West Drainage Canal, at the proposed new borrow sites listed in Table 2-23, at bank protection sites in the NEMDC and PGCC, and at pumping plants throughout the Phase 4b Project area. Construction activities would be conducted continuously, to the extent feasible, between April and November.

Borrow activity is subject to regulation under SMARA, which is administered by the county in which the borrow site is located (i.e., Sacramento and Sutter Counties) (see “California Surface Mining and Reclamation Act” under Section 3.4.1, “Regulatory Setting”). Soil excavation from borrow sites would involve preserving and replacing topsoil on these parcels. Upon completion of soil excavation, the excavated parcels would be reclaimed as agricultural land, natural habitat, or detention basins (see Table 2-23 for a list of the new borrow sites proposed as part of the Phase 4b Project, as well as their proposed post-reclamation use).

As part of the borrow operations, the upper 6–12 inches of topsoil from the borrow sites would be set aside and replaced on-site after project construction in each construction season. After the project is complete, the borrow sites would be recontoured and reclaimed. These borrow operations would support levee construction involving soil stripping and site grading in the footprint of the adjacent levee and seepage berms along the Sacramento River east levee.

Structures and trees would need to be removed from a portion of the Phase 4b Project footprint of the adjacent levee and berms along the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, the west levee of NEMDC North, and the PGCC west levee. In addition, power poles adjacent to the Sacramento River east levee Reach A:16–20 and the American River north levee Reach I:1–4 would need to be removed and relocated. Both of these activities would temporarily disturb soil.

Borrow site excavation; conversion of the Brookfield borrow site to managed marsh; and improvements to levees, canals, and pumping plants would result in the temporary disturbance of soil, and could expose disturbed areas to erosion due to wind or early-season rainfall events. Wind or rainfall of sufficient intensity could dislodge soil particles from the soil surface. Once particles are dislodged, substantial localized erosion could occur. The potential for substantial erosion or loss of topsoil during construction of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative is considered a potentially significant impact. (Similar)

Mitigation Measure 4.4-a(1): Implement Mitigation Measure 4.6-a, “Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions”

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement Mitigation Measure 4.6-a, “Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions,” set forth in full in Section 4.6, “Water Quality.” The final design and construction specifications for all project components, including borrow sites, shall include implementation of standard erosion, siltation, and soil stabilization Best Management Practices (BMPs). In summary, this mitigation measure requires filing a Notice of Intent (NOI) with the Central Valley Regional Water Quality Control Board (RWQCB); implementing standard erosion, siltation, and BMP measures; preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP); and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity.
Implementing this mitigation measure would reduce the impacts related to erosion from construction activities to a less-than-significant level because a SWPPP and BMPs to prevent erosion and siltation would be implemented. (Similar)

Mitigation Measure 4.4-a(2): Secure and Implement the Conditions of the California Surface Mining and Reclamation Act Permit or Exemption

Adjacent Levee Alternative
In the event that any activity is defined as surface mining (under PRC Section 2735, 14 California Code of Regulations Section 3501) and determined to be subject to SMARA (PRC Section 2714), the project proponent(s) shall either seek an exemption or secure, and implement the conditions contained in the SMARA permit as administered and issued by the local agency (applicable county).

Responsibility: Project proponent(s)
Timing: Before the start of construction activities

Implementing this mitigation measure would reduce the impacts related to erosion from construction activities on borrow sites to a less-than-significant level because the project proponent(s) would secure a SMARA permit (if required) and implement its conditions, or would seek an exemption, if applicable. (Similar)

Impact 4.4-b: Potential Soil Erosion During Project Operations

No-Action Alternative

No Phase 4b Project Construction
Under the No-Action Alternative, no Phase 4b Project activities would occur and levee operations would remain the same as existing conditions. Soil erosion is an existing threat to the structural integrity of the Natomas perimeter levee system due to seepage issues and riverbank erosion. If left unrepaired, erosion sites may become larger, increasing the chances of levee failure. In addition, because there is currently inadequate levee height within the Phase 4b Project footprint, the risk of levee overtopping during a flood event remains high. Levee overtopping would likely result in soil erosion and the loss of topsoil in localized areas within several hundred feet of a levee breach. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. Because implementation of the No-Action Alternative would result in continued soil erosion, this impact is considered potentially significant. (Greater)

Potential Levee Failure
Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of the flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Potential levee failure could result from further deterioration of existing erosion sites, levee overtopping, or seepage issues, as described above under “No Phase 4b Project Construction.” Levee failure could result in soil scouring and permanent loss of topsoil in localized areas within several hundred feet of a levee breach. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. While a precise determination of significance is not possible, soil erosion within the Phase 4b Project footprint is an existing condition and is expected to continue. This impact would be potentially significant for the same reasons as described above. (Greater)
Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would address inadequate levee height, through-seepage and underseepage, and riverbank erosion—issues that are directly related to soil erosion and/or the loss of topsoil (see Chapter 2, “Alternatives,” for detailed information). Overtopping and wind wave action could cause substantial soil erosion and the loss of topsoil within the Natomas Basin.

Additional levee height is required along the NCC south levee and Reaches C:1–4B and B:5A–11 of the Sacramento River east levee to meet the minimum requirements established by FEMA as part of the Natomas Flood Insurance Program or the minimum requirements established by the State. As part of these requirements, 3 feet of levee height would be constructed to reduce the potential of overtopping and erosion from wind-induced waves. Implementation of the Phase 4b Project would bring the levees surrounding the Natomas Basin into compliance with applicable standards and requirements, and substantially reduce the potential for substantial soil erosion and/or the loss of topsoil during elevated water events.

As described in Section 1.4.2.1, “Flood Problems and Needs,” seepage beneath and through segments of the Natomas levee system has been identified as a substantial risk to the stability and reliability of the system. Seepage is characterized as either underseepage or through-seepage, both of which result in soil erosion. Underseepage problems occur in locations where levees are constructed on low-permeability foundation soil (silt and clay) underlain by higher-permeability layers (sand and gravel). Under these conditions, seepage travels horizontally under the levee and then is forced vertically upward through the low-permeability foundation layer, often referred to as the “blanket.” Failure of the blanket can occur either by uplift, a condition in which the blanket does not have enough weight to resist the confined pressure acting upon the bottom of the blanket, or by piping (internal erosion) caused by water flowing under high vertical gradients through the erodible blanket and carrying fine soil particles out of the foundation materials. Soil erosion can also occur as through-seepage, which is seepage through a levee embankment that can occur during periods of high river stage. When through-seepage occurs, soil erosion on the landside of the levee may result. Implementation of the Phase 4b Project would address seepage issues along the Sacramento River east levee Reach A:16–20, American River north levee Reach 1:1–4, and NEMDC west levee (Reaches F–G). With these improvements, the potential for through-seepage and underseepage, thus potential for soil erosion, would be substantially reduced.

Riverbank erosion, caused by bed or toe scour and wave wash, is a current problem within the Phase 4b Project footprint. Implementation of the Phase 4b Project would include construction of bank protection structures along the west levee of NEMDC South (Reach H) and the PGCC (Reach E). Riverbank erosion sites are located within the Phase 4b Project footprint; however, these erosion sites are not anticipated to intrude into the projected levee slope of the new adjacent levee. Thus, project elements of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would decrease riverbank erosion issues existing within the Natomas Basin levee system.

As discussed above, implementation of the Phase 4b Project would bring the levees surrounding the Natomas Basin into compliance with applicable standards and requirements. These standards and requirements include repairs that would address inadequate levee height, seepage, and riverbank erosion, and thus the potential for soil erosion and the loss of topsoil. This impact would be beneficial and, therefore, less than significant. (Similar)

Mitigation Measure: No mitigation is required.
Impact 4.4-c: Potential Loss of Mineral Resources

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for loss of mineral resources. There would be no impact. *(Lesser)*

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of the flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Within those areas of the Natomas Basin that are zoned MRZ-1, where no mineral resources are present, there would be no impact as a result of a flood event. For those areas that are zoned MRZ-3, where it is unknown whether mineral resources exist, a precise determination of significance is not possible. Because of this uncertainty, this potential impact to areas of the Natomas Basin that are zoned MRZ-3 is considered too speculative for meaningful consideration. *(Currently Unknown)*

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Phase 4b Project would include excavation of soil from the West Lakeside borrow site, which contains a small area zoned MRZ-3 by the California Department of Conservation (DOC), Division of Mines and Geology. As discussed in Section 3.4, “Geology, Soils, and Mineral Resources,” the MRZ-3 designation indicates that the significance of mineral deposits in that area cannot be evaluated from existing data. Excavation of borrow materials from the West Lakeside borrow site would not be expected to exceed a depth of 2 feet. Because the depth at which an economically viable source of aggregate is unknown in areas designated MRZ-3, mineral deposits could be encountered during borrow activities within the West Lakeside borrow site.

Borrow materials needed for project implementation, however, would be limited to earthen materials (i.e., soils) and would not consist of sediments that would be considered aggregate resources. As described in Section 2.3.3.8, “Environmental Commitments for Borrow Sites,” suitable borrow material would be classified as soil based upon geotechnical data obtained before the start of borrow activities and the Phase 4b Project would not excavate material considered to be construction aggregate. Thus, economically valuable minerals, if present in the West Lakeside borrow site, would not be considered suitable material, and would be avoided. Therefore, this impact would be less than significant. *(Similar)*

Mitigation Measure: No mitigation is required.

4.4.3 Residual Significant Impacts

In the event of levee failure under the No-Action Alternative, the magnitude of impacts due to temporary soil erosion from construction and potential loss of mineral resources is uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be fully mitigated.

Without construction of the Phase 4b Project, soil erosion within the project area would continue and could be exacerbated by factors such as wind and wave runoff and severe storms. Implementation of the Phase 4b Project would reduce soil erosion associated with levee operation.
Implementation of Mitigation Measures 4.4-a(1) and 4.4-a(2) would reduce to less-than-significant levels the temporary potentially significant impacts associated with soil erosion due to construction activities under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative.
4.5 HYDROLOGY AND HYDRAULICS

4.5.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.5.1.1 METHODOLOGY

This section addresses flood management as a defining element of the physical environment in the project area and evaluates the potential hydraulic impacts of the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration on the operations of the Sacramento River Flood Control Project (SRFCP) and interior drainage within the Natomas Basin. It also evaluates the potential impact of proposed cutoff walls on existing groundwater wells.

Technical Planning Studies

This analysis relies on information provided by various public agencies, as well as the following site-specific technical planning studies generated to support the Adjacent Levee Alternative (Proposed Action) and alternatives under consideration in this EIS/EIR:

► Sacramento Area Flood Control Agency, Natomas Levee Improvement Program, Summary Report on Hydraulic Impact Analyses, Phase 4b Project, MBK Engineers 2010 (Appendix C1);

► Shaded Riverine Aquatic Habitat Mitigation Memo for SAFCA NLIP Phase 2 and 3 Projects, AECOM 2009 (Appendix C1);

► Evaluation of Potential Groundwater Impacts Due to Proposed Construction for Natomas Levee Improvement Program, Luhdorff & Scalmanini Consulting Engineers 2009 (Appendix C2);

► Evaluation of Cutoff Walls Impacts on Groundwater Recharge, Sacramento East Levee, Natomas Levee Improvement Program, Kleinfelder 2007, revised 2009 (Appendix C3);

► Potential Impacts of Slurry Cutoff Walls Proposed for Phase 4B of the Natomas Levee Improvement Program, Luhdorff & Scalmanini Consulting Engineers 2010 (Appendix C4);

► Natomas East Main Drainage Canal Erosion Protection Design, Northwest Hydrologic Consultants 2009 (Appendix C5); and

► Draft Pleasant Grove Creek Canal Erosion Analysis, Northwest Hydrologic Consultants 2008 (Appendix C5).

These reports have been updated to include datum conversion from National Geodetic Vertical Datum of 1929 (NGVD29) to North American Vertical Datum of 1988 (NAVD88) in accordance with USACE’s requirement that all vertical datum for USACE inland levee projects and Federal levees within USACE’s Inspection of Completed Works be in NAVD88.

Hydraulic Modeling

The surface hydrology analysis evaluates the potential flood-related impacts of the action alternatives on water surface elevations in the stream and river channels in the project area and in the larger watershed within which the project is situated. Specifically, a UNET hydraulic computer model was used to compare existing conditions in the waterways surrounding the Natomas Basin and in the larger SRFCP both with and without the Adjacent Levee Alternative (Proposed Action) (with-project and without-project [i.e., No-Action Alternative], respectively) assuming no levee failure and other reasonably foreseeable improvements to Folsom Dam and the urban levees.
outside the Natomas Basin. A sensitivity analysis was also performed to show impacts assuming that levees would fail if water reaches the top of the levee. These analyses were conducted by MBK Engineers and are contained in a summary report in Appendix C1.

The existing conditions analysis provided in Tables 4.5-3 through 4.5-8 is based on an evaluation of the levee and reservoir system as it existed in December 2009. The No-Action (without-project) condition assumed implementation of Federally authorized improvements to Folsom Dam and anticipated “early implementation” improvements to the levees protecting existing urban areas outside the Natomas Basin (i.e., American River Basin, West Sacramento, Yuba Basin, and Sutter Basin) so as to provide these areas with 200-year flood risk reduction (0.005 annual exceedance probability [AEP]). The with-project condition added the improvements proposed as part of the entire NLIP, including the Phase 4b Project, to the No-Action condition to display the individual and cumulative impacts of the Adjacent Levee Alternative (Proposed Action) when added to the other reasonably foreseeable urban levee improvement projects in the Sacramento Valley. The NLIP includes additional levee raising already evaluated in the Phase 2 EIR, Phase 2 EIS, Phase 3 EIS and EIR, and Phase 4a EIS and EIR. The Phase 4b Project (both action alternatives) include levee raising above the 0.005 AEP water surface profile along the NEMDC and PGCC (Plates 2-11 and 2-13).

In addition to levee raising, the Phase 4b Project is designed to address several waterside erosion sites and to reduce damage to the levee from burrowing animals through construction of bank protection features along the PGCC and NEMDC South at the locations shown on Plates 2-13 and 2-14. The details of the proposed erosion repairs on the NEMDC and the details of the analysis of erosion potential on the PGCC are included in Appendix C5. Erosion repair and rock slope protection would be constructed at locations where erosion around the outfall structures has been observed. Construction of bank protection features would increase channel roughness and may contribute to a minor amount of channel constriction from the addition of rock protection. Erosion repair and rock bank protection on the PGCC and NEMDC, and low-flow channel realignment in the NEMDC at I-80, were addressed in the UNET hydraulic computer model. In addition, the model assumed creation of shaded riverine aquatic (SRA) habitat mitigation on the Sacramento River (Reach C1), which was in the Phase 3 FEIS. The NEMDC erosion repair sites, which would include rock berms along the low-flow channel, were modeled by modifying the affected cross-sections in the model to reflect these improvements. SRA habitat mitigation along the Sacramento River east levee Reach C:1 (Appendix C1), which consists of increased bank vegetation, was modeled by increasing the bank’s roughness coefficient. PGCC erosion repair was not included in the hydraulic model because it is in an area that is controlled by backwater from the Sacramento River during large flood events and therefore would not affect peak flood stages on the PGCC. Likewise, low-flow channel realignment was not included in the hydraulic model because it would not change the cross-sectional areas of the NEMDC and therefore would not affect the hydraulic capacity of the NEMDC.

The analysis consisted of calibrating the hydraulic model to historic flood events using high-water marks and stream gauge data gathered in connection with the 1997 flood, and modeling the existing Adjacent Levee Alternative (Proposed Action) and No-Action conditions under the following flood scenarios: (1) the 1957 water surface profiles that serve as the minimum design standard for the SRFCP; (2) the 0.01 AEP (100-year) design flood elevation that affects management of SRFCP-protected floodplains under the National Flood Insurance Program (33 CFR Section 65.10); (3) the 0.005 AEP (200-year) design flood elevation that is likely to affect implementation of the floodplain management standards recently adopted by the California Legislature (Chapter 364, Statutes of 2008 [adding Water Code Section 9602(i)]); and (4) the 0.002 AEP (500-year) design flood elevation that represents an extreme flood event and is the largest flood event for which hydrologic input data have been developed for the hydraulic simulation model. Each of these scenarios was modeled assuming that levees outside the project area would not fail when overtopped. However, for comparison purposes, an additional sensitivity analysis was conducted to estimate impacts with the assumption that levee failures would occur if water reaches the top of levee.
4.5.1.2 **Thresholds of Significance**

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to hydrology and hydraulics if they would do any of the following:

- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;

- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

- place housing within a 100-year flood hazard area (0.01 AEP) or place within a 100-year flood hazard area (0.01 AEP) structures that would impede or redirect flood flows;

- expose people or structures to a significant risk of loss, injury, or death involving flooding; or

- substantially alter the existing drainage pattern of a site or an area, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site.

In determining whether a project would expose people or structures to a significant risk as a result of flooding, the project proponent(s) use the following thresholds:

- whether the project would cause encroachment on SRFCP design levee height for the SRFCP design flow for a project levee outside the project area, or

- whether the project would cause a significant increase in flooding in an area that is outside the protection of the SRFCP.

For purposes of these thresholds, “flood hazard area” means an area that does not meet the minimum level of flood protection required by Federal or state law, whichever is more stringent. The 0.01 AEP (100-year flood risk reduction) will be the standard applicable until 2015, or perhaps earlier, depending on when the Central Valley Flood Protection Plan takes effect. At that point, the applicable standard would be governed by Senate Bill 5, namely, either 0.005 AEP protection (200-year flood risk reduction) or “adequate progress” towards meeting this standard by 2025.

4.5.2 **Impacts and Mitigation Measures**

Impact 4.5-a: Hydraulic Impacts on Other Areas and Exposure to Flood Risk

Table 4.5-1 summarizes the conditions and assumptions associated with each of the UNET model runs. Modeling was conducted under existing conditions, future conditions without the Phase 4b Project, and future conditions with construction of the Phase 4b Project. Table 4.5-2 shows the number of levee failures predicted by the model under these conditions for three design floods: 0.01 AEP (100-year), 0.005 AEP (200-year), and 0.002 AEP (500-year). Tables 4.5-3 through 4.5-8 show the modeling outputs (predicted water surface elevations) generated by conditions expected under the target flood scenarios analyzed.
### Table 4.5-1
**Definition of Hydraulic Model Assumptions for Various Conditions**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Top of Levee Assumption</th>
<th>Levee Failure Assumption</th>
<th>Reservoir Operations Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>Existing top of levee grade December 2009 (including California Levee Database information)</td>
<td>Levees overtop without failing</td>
<td>Existing reservoirs and current (2009) operation criteria</td>
</tr>
<tr>
<td>Without-project</td>
<td>Same as the Existing Condition with the following changes: Federally authorized improvements to Folsom Dam are implemented and urban area levees outside the Natomas Basin are assumed to have levees at 200-year (0.005 AEP) water surface +3 feet of levee height; NLIP levees same as the existing condition</td>
<td>Levees overtop without failing</td>
<td>Same as the existing condition except Folsom Dam would be operated in accordance with the Joint Federal Project currently under construction</td>
</tr>
<tr>
<td>With-project ¹</td>
<td>Same as the without-project condition except NLIP levees raised to design level</td>
<td>Levees overtop without failing</td>
<td>Same as the without-project condition</td>
</tr>
<tr>
<td>Existing Sensitivity Analysis</td>
<td>Same as the existing condition</td>
<td>Levees fail when water reaches top of levee</td>
<td>Same as the existing condition</td>
</tr>
<tr>
<td>Without-project Sensitivity Analysis</td>
<td>Same as the without-project condition except that SRFCP levees with top elevations below SRFCP design standard are assumed to be raised to meet this standard</td>
<td>Levees fail when water reaches the top of the levee</td>
<td>Same as the without-project condition</td>
</tr>
<tr>
<td>With-project Sensitivity Analysis</td>
<td>Same as the with-project condition except that SRFCP levees with top elevations below SRFCP design standard are assumed to be raised to meet this standard</td>
<td>Levees fail when water reaches the top of the levee</td>
<td>Same as the without-project condition</td>
</tr>
</tbody>
</table>

Notes: AEP = Annual Exceedance Probability; NLIP = Natomas Levee Improvement Program; SRFCP = Sacramento River Flood Control Project

¹ With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition, including levee raises on the Sacramento River, NCC, PGCC and NEMDC in the locations shown in Figure 3 of Appendix C1. Levee raises as part of the Phase 4b Project would be located on the PGCC and NEMDC (Plates 2-11 and 2-13 in this EIS/EIR).

Source: Appendix C1
### Table 4.5-2
Extent of Levee Overtopping, Without-Project Conditions
(Levees Overtop Without Failing, All Values Approximate)

<table>
<thead>
<tr>
<th>River</th>
<th>Leveed Length (miles)</th>
<th>Approximate Length of Overtopped Levee (miles)</th>
<th>Left Bank(^1)</th>
<th>Right Bank(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.01 AEP (100-Year)</td>
<td>0.005 AEP (200-Year)</td>
</tr>
<tr>
<td>American River</td>
<td>13</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Feather River</td>
<td>50</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Natomas Cross Canal</td>
<td>5</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sacramento Bypass</td>
<td>1.7</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sacramento River upstream of Natomas Cross Canal</td>
<td>90</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sacramento River adjacent to Natomas</td>
<td>18</td>
<td></td>
<td>0</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Sacramento River downstream of American River</td>
<td>60</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sutter Bypass</td>
<td>30</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tisdale Bypass</td>
<td>4</td>
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<td>0</td>
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<tr>
<td>Wadsworth Bypass</td>
<td>4</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yolo Bypass</td>
<td>37</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: AEP = Annual Exceedance Probability
\(^1\) Left and right bank reference based on downstream-facing orientation.
Source: Appendix C1
### Table 4.5-3

0.01 AEP (100-Year) Maximum Water Surface Elevation Summary (No Levee Failures)

<table>
<thead>
<tr>
<th>Location</th>
<th>Maximum Water Surface Elevation (Feet NAVD88(^1))</th>
<th>Change (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Without-project</td>
</tr>
<tr>
<td>Sacramento River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Knight’s Landing (90.22)</td>
<td>44.55</td>
<td>44.53</td>
</tr>
<tr>
<td>at Fremont Weir, west end (84.75)</td>
<td>42.60</td>
<td>42.56</td>
</tr>
<tr>
<td>at Natomas Cross Canal (79.21)</td>
<td>43.44</td>
<td>43.38</td>
</tr>
<tr>
<td>at I-5 (71.00)</td>
<td>39.18</td>
<td>38.94</td>
</tr>
<tr>
<td>at Sacramento Bypass (63.82)</td>
<td>34.27</td>
<td>33.69</td>
</tr>
<tr>
<td>at NEMDC (61.0)</td>
<td>34.81</td>
<td>34.25</td>
</tr>
<tr>
<td>at I Street (59.695)</td>
<td>35.54</td>
<td>33.97</td>
</tr>
<tr>
<td>at Freeport Bridge (46.432)</td>
<td>28.19</td>
<td>27.78</td>
</tr>
<tr>
<td>Natomas Cross Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at SR 99/70 (4.82)</td>
<td>43.50</td>
<td>43.44</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Sankey Road (3.65)</td>
<td>43.36</td>
<td>43.30</td>
</tr>
<tr>
<td>at Fifield Road (1.49)</td>
<td>43.50</td>
<td>43.44</td>
</tr>
<tr>
<td>at Howsley Road (0.40)</td>
<td>43.51</td>
<td>43.45</td>
</tr>
<tr>
<td>Natomas East Main Drainage Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Elverta Road (10.35)</td>
<td>34.26</td>
<td>34.26</td>
</tr>
<tr>
<td>at Elkhorn Boulevard (8.35)</td>
<td>33.47</td>
<td>33.48</td>
</tr>
<tr>
<td>at Main Avenue (6.09)</td>
<td>39.71</td>
<td>39.69</td>
</tr>
<tr>
<td>at West El Camino Avenue (2.96)</td>
<td>36.85</td>
<td>36.18</td>
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<tr>
<td>Feather River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Nicolaus Gage (8.00)</td>
<td>50.98</td>
<td>50.97</td>
</tr>
<tr>
<td>Yolo Bypass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Woodland Gage (51.10)</td>
<td>35.59</td>
<td>35.48</td>
</tr>
<tr>
<td>American River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at H Street (6.471)</td>
<td>45.40</td>
<td>43.11</td>
</tr>
</tbody>
</table>

Notes:
- AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal;
- NAVD88 = North American Vertical Datum of 1988; SR = State Route
- Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
- With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: Appendix C1

---

1 Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
2 With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.
<table>
<thead>
<tr>
<th>Location</th>
<th>Maximum Water Surface Elevation (Feet NAVD88)</th>
<th>Change (Feet)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Without-project</td>
<td>With-project</td>
<td>Existing to without-project</td>
</tr>
<tr>
<td><strong>Sacramento River</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Knight’s Landing (90.22)</td>
<td>45.20</td>
<td>45.20</td>
<td>45.20</td>
<td>0</td>
</tr>
<tr>
<td>at Fremont Weir, west end (84.75)</td>
<td>44.04</td>
<td>44.02</td>
<td>44.03</td>
<td>-0.02</td>
</tr>
<tr>
<td>at Natomas Cross Canal (79.21)</td>
<td>44.91</td>
<td>44.89</td>
<td>44.92</td>
<td>-0.02</td>
</tr>
<tr>
<td>at I-5 (71.00)</td>
<td>40.66</td>
<td>40.35</td>
<td>40.35</td>
<td>-0.31</td>
</tr>
<tr>
<td>at Sacramento Bypass (63.82)</td>
<td>37.19</td>
<td>35.76</td>
<td>35.76</td>
<td>-1.43</td>
</tr>
<tr>
<td>at NEMDC (61.0)</td>
<td>37.97</td>
<td>36.34</td>
<td>36.34</td>
<td>-1.63</td>
</tr>
<tr>
<td>at I Street (59.695)</td>
<td>37.68</td>
<td>36.05</td>
<td>36.05</td>
<td>-1.63</td>
</tr>
<tr>
<td>at Freeport Bridge (46.432)</td>
<td>30.76</td>
<td>29.64</td>
<td>29.64</td>
<td>-1.12</td>
</tr>
<tr>
<td><strong>Natomas Cross Canal</strong></td>
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<td></td>
<td></td>
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<tr>
<td>at SR 99/70 (4.82)</td>
<td>44.94</td>
<td>44.92</td>
<td>44.95</td>
<td>-0.02</td>
</tr>
<tr>
<td><strong>Pleasant Grove Creek Canal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Sankey Road (3.65)</td>
<td>44.69</td>
<td>44.68</td>
<td>44.70</td>
<td>-0.01</td>
</tr>
<tr>
<td>at Fifield Road (1.49)</td>
<td>44.89</td>
<td>44.88</td>
<td>44.90</td>
<td>-0.01</td>
</tr>
<tr>
<td>at Howsley Road (0.40)</td>
<td>44.93</td>
<td>44.91</td>
<td>44.94</td>
<td>-0.02</td>
</tr>
<tr>
<td><strong>Natomas East Main Drainage Canal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Elverta Road (10.35)</td>
<td>38.25</td>
<td>38.23</td>
<td>38.33</td>
<td>-0.02</td>
</tr>
<tr>
<td>at Elkhorn Boulevard (8.35)</td>
<td>38.11</td>
<td>38.09</td>
<td>38.19</td>
<td>-0.02</td>
</tr>
<tr>
<td>at Main Avenue (6.09)</td>
<td>44.18</td>
<td>41.05</td>
<td>41.05</td>
<td>-3.13</td>
</tr>
<tr>
<td>at West El Camino Avenue (2.96)</td>
<td>42.28</td>
<td>38.44</td>
<td>38.44</td>
<td>-3.84</td>
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<tr>
<td><strong>Feather River</strong></td>
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<td></td>
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<tr>
<td>at Nicolaus Gage (8.00)</td>
<td>53.32</td>
<td>53.32</td>
<td>53.32</td>
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<tr>
<td><strong>Yolo Bypass</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Woodland Gage (51.10)</td>
<td>36.93</td>
<td>36.87</td>
<td>36.88</td>
<td>-0.06</td>
</tr>
<tr>
<td><strong>American River</strong></td>
<td></td>
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<td></td>
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<tr>
<td>at H Street (6.471)</td>
<td>49.61</td>
<td>46.72</td>
<td>46.72</td>
<td>-2.89</td>
</tr>
</tbody>
</table>

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route

1 Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
2 With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: Appendix C1
<table>
<thead>
<tr>
<th>Location (USACE Comprehensive Study River Mile)</th>
<th>Maximum Water Surface Elevation (Feet NAVD88)</th>
<th>Change (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Without-project</td>
</tr>
<tr>
<td>Sacramento River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Knight’s Landing (90.22)</td>
<td>45.49</td>
<td>45.51</td>
</tr>
<tr>
<td>at Fremont Weir, west end (84.75)</td>
<td>44.91</td>
<td>44.95</td>
</tr>
<tr>
<td>at Natomas Cross Canal (79.21)</td>
<td>45.57</td>
<td>45.59</td>
</tr>
<tr>
<td>at I-5 (71.00)</td>
<td>41.54</td>
<td>41.55</td>
</tr>
<tr>
<td>at Sacramento Bypass (63.82)</td>
<td>38.66</td>
<td>38.71</td>
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<tr>
<td>at NEMDC (61.0)</td>
<td>39.57</td>
<td>39.68</td>
</tr>
<tr>
<td>at I Street (59.695)</td>
<td>39.24</td>
<td>39.38</td>
</tr>
<tr>
<td>at Freeport Bridge (46.432)</td>
<td>31.74</td>
<td>31.91</td>
</tr>
<tr>
<td>Natomas Cross Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at SR 99/70 (4.82)</td>
<td>45.54</td>
<td>45.55</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal</td>
<td></td>
<td></td>
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<tr>
<td>at Sankey Road (3.65)</td>
<td>45.35</td>
<td>45.35</td>
</tr>
<tr>
<td>at Fifeil Road (1.49)</td>
<td>45.59</td>
<td>45.60</td>
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<tr>
<td>at Howsley Road (0.40)</td>
<td>45.60</td>
<td>45.61</td>
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<tr>
<td>Natomas East Main Drainage Canal</td>
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<tr>
<td>at Elverta Road (10.35)</td>
<td>41.90</td>
<td>41.90</td>
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<td>at Elkhoron Boulevard (8.35)</td>
<td>41.75</td>
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<tr>
<td>at Main Avenue (6.09)</td>
<td>47.03</td>
<td>47.09</td>
</tr>
<tr>
<td>at West El Camino Avenue (2.96)</td>
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<td>45.41</td>
</tr>
<tr>
<td>Feather River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Nicolaus Gage (8.00)</td>
<td>55.79</td>
<td>55.93</td>
</tr>
<tr>
<td>Yolo Bypass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Woodland Gage (51.10)</td>
<td>38.03</td>
<td>38.08</td>
</tr>
<tr>
<td>American River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at H Street (6.471)</td>
<td>50.54</td>
<td>50.61</td>
</tr>
</tbody>
</table>

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route
1 Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
2 With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.
Source: Appendix C1
## 0.01 AEP (100-Year) Maximum Water Surface Elevation Summary
(Levees Fail When Water Reaches Top of Levee—Sensitivity Analysis)

<table>
<thead>
<tr>
<th>Location Description</th>
<th>Location (USACE Comprehensive Study River Mile)</th>
<th>Maximum Water Surface Elevation (Feet NAVD88)¹</th>
<th>Change (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Without-project</td>
</tr>
<tr>
<td>Sacramento River</td>
<td>at Knight’s Landing (90.22)</td>
<td>43.95</td>
<td>43.95</td>
</tr>
<tr>
<td></td>
<td>at Fremont Weir, west end (84.75)</td>
<td>42.22</td>
<td>42.19</td>
</tr>
<tr>
<td></td>
<td>at Natomas Cross Canal (79.21)</td>
<td>42.87</td>
<td>42.82</td>
</tr>
<tr>
<td></td>
<td>at I-5 (71.00)</td>
<td>38.74</td>
<td>38.50</td>
</tr>
<tr>
<td></td>
<td>at Sacramento Bypass (63.82)</td>
<td>34.04</td>
<td>33.43</td>
</tr>
<tr>
<td></td>
<td>at NEMDC (61.0)</td>
<td>34.55</td>
<td>33.96</td>
</tr>
<tr>
<td></td>
<td>at I Street (59.695)</td>
<td>34.28</td>
<td>33.69</td>
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<tr>
<td></td>
<td>at Freeport Bridge (46.432)</td>
<td>28.00</td>
<td>27.51</td>
</tr>
<tr>
<td>Natomas Cross Canal</td>
<td>at SR 99/70 (4.82)</td>
<td>42.94</td>
<td>42.94</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal</td>
<td>at Sankey Road (3.65)</td>
<td>42.80</td>
<td>42.82</td>
</tr>
<tr>
<td></td>
<td>at Fifield Road (1.49)</td>
<td>42.91</td>
<td>42.92</td>
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<tr>
<td></td>
<td>at Howsley Road (0.40)</td>
<td>42.91</td>
<td>42.93</td>
</tr>
<tr>
<td>Natomas East Main Drainage Canal</td>
<td>at Elverta Road (10.35)</td>
<td>34.26</td>
<td>34.34</td>
</tr>
<tr>
<td></td>
<td>at Elkhorn Boulevard (8.35)</td>
<td>33.47</td>
<td>33.49</td>
</tr>
<tr>
<td></td>
<td>at Main Avenue (6.09)</td>
<td>39.70</td>
<td>39.74</td>
</tr>
<tr>
<td></td>
<td>at West El Camino Avenue (2.96)</td>
<td>36.81</td>
<td>36.16</td>
</tr>
<tr>
<td>Feather River</td>
<td>at Nicolaus Gage (8.00)</td>
<td>50.87</td>
<td>50.86</td>
</tr>
<tr>
<td>Yolo Bypass</td>
<td>at Woodland Gage (51.10)</td>
<td>35.22</td>
<td>35.13</td>
</tr>
<tr>
<td>American River</td>
<td>at H Street (6.471)</td>
<td>45.39</td>
<td>43.08</td>
</tr>
</tbody>
</table>

Notes:
1. Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
2. With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: Appendix C1
### Table 4.5-7
0.005 AEP (200-Year) Maximum Water Surface Elevation Summary
(Levees Fail When Water Reaches Top of Levee—Sensitivity Analysis)

<table>
<thead>
<tr>
<th>Location</th>
<th>Maximum Water Surface Elevation (Feet NAVD88)</th>
<th>Change (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Without-project</td>
</tr>
<tr>
<td>Sacramento River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Knight’s Landing (90.22)</td>
<td>43.96</td>
<td>43.96</td>
</tr>
<tr>
<td>at Fremont Weir, west end (84.75)</td>
<td>42.80</td>
<td>42.82</td>
</tr>
<tr>
<td>at Natomas Cross Canal (79.21)</td>
<td>43.29</td>
<td>43.28</td>
</tr>
<tr>
<td>at I-5 (71.00)</td>
<td>39.58</td>
<td>39.30</td>
</tr>
<tr>
<td>at Sacramento Bypass (63.82)</td>
<td>36.39</td>
<td>35.10</td>
</tr>
<tr>
<td>at NEMDC (61.0)</td>
<td>37.13</td>
<td>35.66</td>
</tr>
<tr>
<td>at I Street (59.695)</td>
<td>36.84</td>
<td>35.38</td>
</tr>
<tr>
<td>at Freeport Bridge (46.432)</td>
<td>30.02</td>
<td>28.88</td>
</tr>
<tr>
<td>Natomas Cross Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at SR 99/70 (4.82)</td>
<td>43.42</td>
<td>43.45</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Sankey Road (3.65)</td>
<td>43.43</td>
<td>43.48</td>
</tr>
<tr>
<td>at Fifield Road (1.49)</td>
<td>43.52</td>
<td>43.57</td>
</tr>
<tr>
<td>at Howsley Road (0.40)</td>
<td>43.49</td>
<td>43.53</td>
</tr>
<tr>
<td>Natomas East Main Drainage Canal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Elverta Road (10.35)</td>
<td>34.66</td>
<td>34.66</td>
</tr>
<tr>
<td>at Elkhorn Boulevard (8.35)</td>
<td>33.78</td>
<td>33.78</td>
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<td>at Main Avenue (6.09)</td>
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<td>41.03</td>
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<tr>
<td>at West El Camino Avenue (2.96)</td>
<td>42.28</td>
<td>38.31</td>
</tr>
<tr>
<td>Feather River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Nicolaus Gage (8.00)</td>
<td>52.42</td>
<td>52.48</td>
</tr>
<tr>
<td>Yolo Bypass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Woodland Gage (51.10)</td>
<td>35.91</td>
<td>35.85</td>
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<td>American River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at H Street (6.471)</td>
<td>49.28</td>
<td>46.62</td>
</tr>
</tbody>
</table>

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route
1 Water surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
2 With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.

Source: Appendix C1
## Table 4.5-8
0.002 AEP (500-Year) Maximum Water Surface Elevation Summary
(Levees Fail When Water Reaches Top of Levee—Sensitivity Analysis)

<table>
<thead>
<tr>
<th>Location</th>
<th>Location</th>
<th>Maximum Water Surface Elevation (Feet NAVD88)</th>
<th>Change (Feet)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing Without-project With-project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento River</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Knight’s Landing (90.22)</td>
<td></td>
<td>44.10</td>
<td>+0.01</td>
<td>+0.01</td>
</tr>
<tr>
<td>at Fremont Weir, west end (84.75)</td>
<td></td>
<td>43.62</td>
<td>+0.02</td>
<td>0</td>
</tr>
<tr>
<td>at Natomas Cross Canal (79.21)</td>
<td></td>
<td>44.21</td>
<td>+0.03</td>
<td>0</td>
</tr>
<tr>
<td>at I-5 (71.00)</td>
<td></td>
<td>39.92</td>
<td>-0.47</td>
<td>+0.02</td>
</tr>
<tr>
<td>at Sacramento Bypass (63.82)</td>
<td></td>
<td>37.10</td>
<td>-0.39</td>
<td>-0.01</td>
</tr>
<tr>
<td>at NEMDC (61.0)</td>
<td></td>
<td>37.93</td>
<td>-0.53</td>
<td>-0.02</td>
</tr>
<tr>
<td>at I Street (59.695)</td>
<td></td>
<td>37.62</td>
<td>-0.52</td>
<td>-0.02</td>
</tr>
<tr>
<td>at Freeport Bridge (46.432)</td>
<td></td>
<td>30.49</td>
<td>-0.33</td>
<td>-0.01</td>
</tr>
<tr>
<td>Natomas Cross Canal</td>
<td>at SR 99/70 (4.82)</td>
<td>44.42</td>
<td>+0.01</td>
<td>+0.01</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Sankey Road (3.65)</td>
<td></td>
<td>44.45</td>
<td>0</td>
<td>+0.01</td>
</tr>
<tr>
<td>at Fifield Road (1.49)</td>
<td></td>
<td>44.59</td>
<td>0</td>
<td>+0.01</td>
</tr>
<tr>
<td>at Howsley Road (0.40)</td>
<td></td>
<td>44.57</td>
<td>0</td>
<td>+0.01</td>
</tr>
<tr>
<td>Natomas East Main Drainage Canal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Elverta Road (10.35)</td>
<td></td>
<td>34.46</td>
<td>+0.26</td>
<td>+0.32</td>
</tr>
<tr>
<td>at Elkhorn Boulevard (8.35)</td>
<td></td>
<td>35.97</td>
<td>+0.38</td>
<td>+0.40</td>
</tr>
<tr>
<td>at Main Avenue (6.09)</td>
<td></td>
<td>45.62</td>
<td>-0.34</td>
<td>0</td>
</tr>
<tr>
<td>at West El Camino Avenue (2.96)</td>
<td></td>
<td>43.49</td>
<td>-0.24</td>
<td>0</td>
</tr>
<tr>
<td>Feather River</td>
<td>at Nicolaus Gage (8.00)</td>
<td>54.27</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yolo Bypass</td>
<td>at Woodland Gage (51.10)</td>
<td>36.57</td>
<td>+0.05</td>
<td>0</td>
</tr>
<tr>
<td>American River</td>
<td>at H Street (6.471)</td>
<td>49.39</td>
<td>+0.72</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: AEP = Annual Exceedance Probability; I-5 = Interstate 5; NEMDC = Natomas East Main Drainage Canal; NAVD88 = North American Vertical Datum of 1988; SR = State Route
1 WATER surface elevations originally calculated in National Geodetic Vertical Datum of 1929 (NGVD29). Converted to NAVD88 by adding 2.3 feet (0 NGVD29 = 2.3 NAVD88).
2 With-project condition adds the improvements proposed as part of the NLIP regardless of levee construction alternative (i.e., the Adjacent Levee Alternative [Proposed Action] or the Fix-in-Place Alternative) to the without-project condition.
Source: Appendix C1

The 0.002 AEP (500-year), no levee failure flood scenario represents the worst-case scenario for the Sacramento River and the NCC under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. Under the much more likely assumption that upstream levees would fail when water reaches the top of the levee, the water surface elevations around the Natomas Basin would be the same or dramatically lower than the 200-year (0.005 AEP) (no levee failure) and 500-year (0.002 AEP) (no levee failure) water surface elevations that were
used for the design of the NLIP, with the one exception of a predicted 0.05-foot water surface elevation increase on the NEMDC at Elkhorn Boulevard during a 500-year (0.002 AEP) profile. The 500-year (0.002 AEP) (with levee failures) water surface elevations predicted in the Sacramento River channel under the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative are essentially the same as the 200-year (0.002 AEP) (no levee failure) water surface elevations predicted in the Sacramento River channel without the project (No-Action Alternative).

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction or operational activities would occur; therefore, hydrology or hydraulics within water bodies within the project area would not be altered. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Wind and wave run-up or seepage conditions could cause portions of this system to fail, triggering widespread flooding and extensive damage to property within the Basin. Residences on the waterside of the Sacramento River levee in the vicinity of a levee breach could be engulfed, access to residences on the waterside of the levee and within the Basin could be cut off, and interior roadways and other infrastructure damaged. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time of flooding. While a precise determination of significance is uncertain, due to the uncontrolled consequences of levee failure, this impact is still assumed to be significant because nearly any type of levee failure in the Natomas Basin would have a high potential for substantial effects on channel hydrology, hydraulics, and flooding. As discussed in Section 4.1, “Approach to the Environmental Analysis,” no mitigation is required. This impact would remain significant and unavoidable. *(Greater)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

Under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, levee raises would occur on the west levees of the PGCC and NEMDC (Plates 2-11, 2-13, and 2-14) to provide the required 3 feet of levee height above the 0.005 AEP (200-year) design water surface profile. This levee height requirement originates in National Flood Insurance Program regulations and the engineering practice of the California Department of Water Resources, and this requirement has been established by FEMA to develop design standards for providing a 0.005 AEP (200-year) level of flood damage reduction for urban areas protected by levees in the Central Valley. Analysis of hydraulic impacts of these levee raises is cumulative and includes the levee raises on the Sacramento River east levee and NCC south levee that were analyzed as part of the Phase 2, Phase 3, and Phase 4a Projects.

**Tables 4.5-3 through 4.5-5** show the change in water surface elevations from “without-project to with-project” that would result from construction of the Phase 4b Project in the 0.01 AEP (100-year), 0.005 AEP (200-year), and 0.002 AEP (500-year) model runs. In the 0.01 AEP (100-year) and 0.005 AEP (200-year) model simulations, most locations in the waterways around the Natomas Basin would see little or no change in maximum water surface elevations, with most increases ranging from 0.01 feet to 0.03 feet (less than one-half inch). In the 0.005 AEP (200-year) event, the results show a slight increase (0.1 feet or slightly over one inch) in the NEMDC at Elverta Road and Elkhorn Boulevard. In this section of the NEMDC, there is no east levee, and flood waters back up into a largely undeveloped area between the NEMDC and a railroad berm. This change in water surface elevation would be too small to affect the few structures located on high ground in this area. It should be noted
that changes in water surface elevations of 0.1 feet are not detectable in typical conditions of major flood events, where waves of several feet can be generated by wind or turbulence caused by currents.

In the 0.002 AEP (500-year) event (Table 4.5-5), predicted water surface elevation increases would range up to 0.18 feet along the Natomas reach of the Sacramento River, up to 0.21 feet in the NCC, up to 0.18 feet in the PGCC, and up to 0.35 feet in the NEMDC. However, this event, with the assumption of no levee failures in non-urban areas, is extremely unlikely, given that the predicted number of levee failures in the system for the 500-year event (with-project) would be 133 (Table 4.5-2). With the reasonable and more defensible assumption that levees fail when water reaches to the levee top, predicted changes in water surface elevations are lower (Tables 4.5-7 through 4.5-9), with some water surface elevations reduced slightly in relation to the “existing without-project” condition for the 0.01 AEP (100-year) event. However, in the NEMDC at Elverta Road and Elkhorn Boulevard, water surface elevations would increase to 0.32 and 0.40 feet (approximately 4 to 5 inches, respectively) in the 0.002 AEP (500-year) event under the Proposed Action or Fix-in-Place Alternative when compared to the No-Action Alternative.

In summary, implementation of the action alternatives would not measurably alter water surface elevations except in the most extreme circumstances [0.002 AEP (500-year) flood event] and only at the NEMDC at Elverta Road and Elkhorn Boulevard. The action alternatives would not change the existing geometry of the channels surrounding the Natomas Basin and therefore would not cause significant changes to water flow in these channels, or cause adverse hydraulic effects upstream or downstream of the project area during peak flows. In addition, these alternatives would not expose people or structures to a significant risk of flooding. Rather, this risk would be alleviated because seepage remediation measures would reduce the potential for seepage-induced failure, the waterside erosion repair measures would address existing and potential future erosion to protect levee stability, and additional remediation measures would protect against risks to levee integrity caused by beavers and burrowing animals. Because the action alternatives would replace or upgrade existing levees using up-to-date design and construction standards, implementation of either of these action alternatives would substantially reduce the risk of flooding of the Natomas Basin, which would be a **less-than-significant (beneficial)** impact. *(Similar)*

**Mitigation Measure: No mitigation is required.**

**Impact 4.5-b: Alteration of Local Drainage**

**No-Action Alternative**

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, construction activities related to the project would not alter the local drainage systems described in Chapter 2.0, “Alternatives.” There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could alter local drainage systems. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related effects on local drainage systems cannot be predicted. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration. (Currently Unknown)**
Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The primary source of soil borrow material that would be used for the Phase 4b Project levee improvements along the Sacramento River east levee and the American River north levee would be the South Fisherman’s Lake Borrow Area and the West Lakeside School Site, with the Fisherman’s Lake Borrow Area as a back-up source. The primary source of borrow material for levee improvements along the PGCC and NEMDC North would be the Triangle Properties Borrow Area, the Krumenacher Borrow Site, and the Twin Rivers Unified School District Stockpile Site as back-up borrow sources. The Krumenacher Borrow Site and the Twin Rivers Unified School District Stockpile Site were previously analyzed as part of the Phase 3 Project EIS and EIR (see Section 4.1.3, “Summary of Previous NEPA and CEQA Analyses of Borrow Sites”). After excavation of the borrow material, these sites would be graded to allow positive draining by gravity, with no ponded open water, then returned to agricultural uses. Portions of the Triangle Properties Borrow Area, however, could be converted to detention basins to provide replacement storage for stormwater drainage for properties east of the PGCC, as shown on Plate 2-13. Five culverts underneath the PGCC currently allow some stormwater to drain from the area east of the PGCC into the northeast corner of the Natomas Basin. The Phase 4b Project includes an option to remove these culverts to address a potential risk to the integrity of the PGCC west levee.

Depending on the design of the detention basins, pumping stations may be needed to discharge water out of the basins and into the PGCC. Installation of culverts under Pierce-Roberts drain, Pleasant Grove Creek, and Curry Creek may also be needed to interconnect drainage subbasins. If constructed, detention basins would be located in the Triangle Properties Borrow Area after it is excavated to provide soil borrow materials for levee improvements. The detention basins and pumping facilities would be sized to handle runoff volumes of a 10-day storm event with a 0.01 AEP to protect structures, although temporary flooding of agricultural fields may be allowed during such an event.

A 200-acre managed marsh would be developed within the Brookfield Borrow Site (Plate 2-13), which was previously excavated to provide soil borrow for construction of the NCC south levee. To provide irrigation to the site following the marsh creation and to eliminate the need to replace all of the on-site wells, the Chappell Ditch and Drain would be upgraded and extended to provide surface water to the Brookfield marsh and adjacent rice fields to the south and east (see Plate 2-13). The marsh would be managed to maintain a relatively consistent water level within the confines of the marsh and would not interrupt irrigation or drainage services to adjacent properties or change the route water levels in surrounding irrigation and drainage canals.

In addition to the Chappell Ditch discussed above, several other irrigation infrastructure components would be relocated or realigned to accommodate levee improvements and reduce underseepage potential: the West Drainage Canal, the Riego Road Canal, the Vestal Drain, the Morrison Canal, and private irrigation ditches and buried piping. The NEMDC low-flow channel would also be realigned at the I-80 overcrossing. As noted above, an NCMWC irrigation canal south of the Brookfield Borrow Site would supply water to the proposed managed marsh. The canal would be widened and extended to the east to service the marsh and increase availability of irrigation service in the area. This expansion could potentially affect the function of an adjacent drainage canal (Plate 2-13). Drainage would need to be rerouted to new replacement canals before the existing canals are decommissioned to ensure that local drainage and ponding areas would not be adversely affected as a result of project construction. To prevent disruption of irrigation service, the private irrigation systems would be replaced with in-kind facilities. Detailed engineering and design plans for these replacements are still under development.

Up to 40 acres of woodlands, consisting of native riparian and valley oak woodland species, would be planted in the Lower Dry Creek drainage immediately east of the NEMDC (Plate 2-14). During major storm events, portions of this area fill with runoff from Dry and Robla Creeks that backs up as it drains into the NEMDC downstream of the NEMDC Stormwater Pumping Station. Without careful selection of planting areas to avoid adverse hydraulic effects, such as increased channel roughness or displacement of flood storage capacity, this component of the Phase 4b Project could potentially contribute to local flooding of surrounding residential and
commercial areas during periods when the Lower Dry Creek drainage is acting as a floodway and/or flood storage area.

As part of the extension of the adjacent levee raise in Reach B:10–12A (Station 632+00 to Station 662+00), the drainage swale would be constructed between the levee and Garden Highway. No new waterside drainage outlets would be needed beyond the range of 7–10 outlets that were analyzed as part of the Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f), but the spacing between the outlets would increase, and one of the outlets would be located downstream of Powerline Road.

Because the action alternatives would temporarily or even potentially permanently alter the existing drainage pattern of the project area, localized flooding could occur, resulting in a potentially significant impact. (Similar)

Mitigation Measure 4.5-b(1): Coordinate with Landowners and Drainage Infrastructure Operators, Prepare Final Drainage Studies as Needed, and Implement Proper Project Design

<table>
<thead>
<tr>
<th>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative</th>
<th>During project design, the project proponent’s project engineers shall coordinate with owners and operators of local drainage systems and landowners served by the systems. This coordination shall enable the project engineers to evaluate the preproject and postproject drainage needs and the design features to consider in project design to prevent any substantial project-related drainage disruption or alteration in runoff that would increase the potential for local flooding. If substantial alteration of runoff patterns or disruption of a local drainage system could result from a project feature, a final drainage study shall be prepared to identify alternative means to provide equivalent irrigation and drainage services that would be implemented as part of project design. The study shall consider the design flows of any existing facilities that would be crossed by project features and shall develop appropriate plans for relocation or other modification of these facilities and construction of new facilities, as needed, to ensure that the altered systems provide drainage services during and after construction that are equivalent to the drainage services that were provided prior to construction. Any necessary features to remediate project-induced drainage problems shall be constructed before the project is completed or as part of the project, depending on site-specific conditions. Any additional coordination with landowners and drainage infrastructure operators related to future selection of borrow sites in the Fisherman’s Lake Area shall be completed by the Project Proponent(s) before commencement of any earth-moving activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility:</td>
<td>Project proponent(s)</td>
</tr>
<tr>
<td>Timing:</td>
<td>Before construction</td>
</tr>
</tbody>
</table>

Implementing this mitigation would reduce the potentially significant impacts to local drainage to a less-than-significant level by enabling the project engineers to evaluate the preproject and postproject drainage needs and ensuring that the project is designed appropriately to prevent a substantial project-related drainage disruption, alteration of runoff patterns, or disruption of the local drainage system. (Similar)

Mitigation Measure 4.5-b(2): Prepare Hydraulic Study, and Design and Implement Lower Dry Creek Woodland Planting Areas to Avoid Adverse Hydraulic Effects

| Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative | During project design, the project proponent(s) shall conduct a hydraulic analysis of the Lower Dry Creek Drainage. Woodlands shall only be planted in areas determined by the hydraulic analysis to have no adverse effects on the function of the drainage to provide flood services or otherwise contribute to local flooding in the surrounding areas. |
Implementing this mitigation would reduce adverse hydraulic impacts of woodland plantings in the Lower Dry Creek Drainage through the preparation of a hydraulic study and the implementation of its recommendations to a less-than-significant level. *(Similar)*

**Impact 4.5-c: Effects on Groundwater**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly disturb groundwater recharge or flow. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding of the Basin, should it occur in the absence of improvements to the perimeter levee system, would not inhibit groundwater recharge. Therefore, there would be no impact. *(Lesser)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

**Effects of Groundwater Well Relocations**

A total of 18 private irrigation wells would need to be relocated outside of the Phase 4b Project levee improvements footprint. One well is located in the Sacramento River east levee Reach A:18B, nine wells are located along the west levee of the NEMDC, and eight wells are located along the west levee of the PGCC. Before levee construction commences, these existing wells would be abandoned, and replacement wells would be drilled at least 100 feet from the landside toe of the widened levees. Existing wells would be abandoned in accordance with the applicable state, county requirements to prevent future groundwater contamination. Because the replacement wells would be drilled in close proximity to the existing wells, and would be drilled to a similar depth within the aquifer, impacts to groundwater levels and yields would be negligible. The replacement wells would also have the same capacity as the existing wells and would be operated in a similar fashion. As a result, no substantial decrease in groundwater levels or well yields, or increase in pumping costs are expected to be caused by the relocation of the 18 private irrigation wells; therefore, this impact is considered less than significant.

**Effects of Cutoff Walls on Existing Groundwater Wells**

Cutoff walls would be installed in Sacramento River east levee Reach A:19B–20B (and potentially in Reach A:16–19A), American River north levee Reach I:1–4, and the west levees of the PGCC and NEMDC North. The cutoff wall in the PGCC west levee was originally proposed as part of the AEP 0.01 (100-year) levee raise analyzed as part of the Phase 3 Project, but would be constructed as part of the AEP 0.005 (200-year) levee addressed in the Phase 4b Project. The presence of cutoff walls could restrict the movement of groundwater in either direction (away from or toward the Sacramento River or NCC), potentially increasing or decreasing localized near-surface groundwater levels in areas immediately adjacent to the cutoff wall. A significant drop in groundwater levels could decrease the yields of nearby wells or increase the pumping costs of those wells. The combined effect of all of the NLIP construction activities (including the contribution of the Phase 4b Project) on the overall groundwater budget for the Natomas Basin under both existing and future conditions is discussed in Chapter 5, “Cumulative and Growth-Inducing Impacts, and Other Statutory Requirements.”
Luhdorff & Scalmanini Consulting Engineers (LSCE) conducted an analysis of the potential effect of the proposed cutoff walls on existing wells located within the Phase 4b Project area (Appendix C4). Along the NEMDC North, 13 domestic wells, 11 irrigation wells, and 2 industrial wells are located within the project footprint (Mead and Hunt 2009). The domestic wells mapped along the NEMDC North are 96–220 feet deep, with an average of 153 feet deep. The irrigation and industrial wells are 133–952 feet deep, with an average of 358 feet deep. Most of the drillers’ logs available for these domestic wells do not show the perforated intervals, but the top of the perforations would likely be below the tip of the adjacent cutoff wall for almost all wells. The proposed cutoff walls would be about 20–60 feet deep from the toe of the levee, with a maximum depth of 110 feet. Most of the cutoff wall depths would be above the estimated average water table elevation. The combination of relatively deep wells and relatively shallow cutoff walls signifies that no impacts to nearby domestic wells would be expected.

Cutoff walls are proposed for Sacramento River east levee Reach A:19B–20. Seepage berms are the preferred method of seepage remediation in Reach A:16–19A, as shown on Plate 2-7a. However, use of cutoff walls in Reach A:16–19A has not been ruled out because geotechnical analysis and recommendations have not been finalized. As shown in Table 7 of the LSCE technical memorandum (Appendix C4), 18 domestic wells have been mapped along Sacramento River east levee Reach A:16–20, and these wells would potentially be in the vicinity of cutoff walls constructed as part of the Phase 4b Project. These wells range in depth from 90–180 feet, with an average of depth of 131 feet. Measurable impacts from installation of cutoff walls are considered unlikely in this portion of the Phase 4b Project area based on one or more of the following criteria for each well analyzed:

- the well is considerably deeper than the tip of the adjacent cutoff wall,
- the top of the perforated interval is below or only slightly above the tip of the proposed cutoff wall,
- the well is located relatively far away from the levee,
- the well is unused, or
- the well is scheduled for replacement because it is within the footprint of proposed levee improvements.

Most of the wells mapped along Sacramento River east levee Reach A:16–20 would not be affected by proposed cutoff walls because the wells would be deeper than the bottom of the cutoff walls, or the wells would be located far enough away from the cutoff wall that they would not experience any changes in local groundwater conditions. One irrigation well, located in Reach A:18 is within the proposed levee construction footprint and is currently scheduled for replacement. The replacement well would be drilled deep enough to avoid potential cutoff wall impacts. Some of the other wells within the construction footprint (see Figure 3 of the LSCE technical memorandum in Appendix C4) may also be replaced, although this has not yet been determined.

A few of the mapped and unmapped wells could be affected by planned slurry cutoff walls because they do not meet at least one of the above criteria. However, any decreases in well yield or other impacts to private wells as a result of cutoff wall installation would be expected to be small and not significantly affect well production. Well capacity data are limited in Sacramento River east levee Reach A:16–20, but the capacities of domestic wells located further north along the Sacramento River east levee average more than 60 gallons per minute (gpm) based on initial well test results shown on well completion reports contained in Appendix C4. The only well capacity estimate available for a domestic well in Reach A:16–20 is also 60 gpm. With such high capacities, domestic wells only need to pump for a few minutes a day to meet normal water demands. Therefore, very localized individual cones of depression for these wells would most likely not reach the adjacent cutoff wall, and no interference with pumping would occur. If a well’s cone of depression were to reach the cutoff wall, there could be some additional drawdown and decrease in pumping capacity. However, because of the short pumping cycles, impacts would not be expected to be measurable.

As a result, no substantial decrease in well yields or increase in pumping costs is expected to be caused by the cutoff walls along the Sacramento River east levee and the west levee of NEMDC North; therefore, this impact is considered less than significant. (Similar)
Mitigation Measure: No mitigation is required.

4.5.3 RESIDUAL SIGNIFICANT IMPACTS

Because mitigation would not be required for the No-Action Alternative, impacts related to the continued exposure of the Natomas Basin to a significant residual risk of flooding are assumed to be significant and unavoidable. Under the No-Action Alternative, impacts to local drainage systems are uncertain. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration.

Implementation of the mitigation measures described in this section for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would reduce residual hydraulic impacts to a less-than-significant level.

As noted in Section 2.5.1, “Residual Risk of Flooding,” implementation of the Phase 4b Project would substantially lessen the probability of a flood in the Natomas Basin due to a levee failure. However, the Basin would remain subject to a residual risk of flooding, which would be the same under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. The project proponent(s) would be required to maintain a safety plan, as detailed in Section 2.5.1.
4.6 WATER QUALITY

4.6.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.6.1.1 METHODOLOGY

Water quality impacts that could result from project construction activities and project operation were evaluated based on the construction practices and materials that would be used, the location and duration of the activities, and the potential for degradation of water quality or beneficial uses of project area waterways.

4.6.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to water quality if they would violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality.

4.6.2 IMPACTS AND MITIGATION MEASURES

Impact 4.6-a: Temporary Impacts on Water Quality from Stormwater Runoff, Erosion, or Spills

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to directly degrade water quality from stormwater runoff. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Potential flooding and inundation of the Natomas Basin could introduce large quantities of agricultural pesticides, oil, gasoline, and other hazardous materials into waters and subsequently into stream channels and groundwater. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related impacts on water quality cannot be predicted. A precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Project implementation would include extensive ground-disturbing activities during construction, many of them near local drainages and waterways that could become contaminated by soil or construction substances. These waterways include the Sacramento River, the American River, the NEMDC, the PGCC, the NCC, and the West Drainage Canal. The Sacramento River is a receiving water for much of the drainage from the Natomas Basin (including agricultural drainage).

The Adjacent Levee Alternative (Proposed Action) would involve construction of an adjacent levee and seepage remediation along Reach A:16–20 of the Sacramento River east levee (including construction of cutoff walls,
seepage berms, relief wells, and landside slope flattening); installation of cutoff walls and slope flattening along Reach I:1–4 of the American River north levee; levee raising, levee widening, and seepage remediation (including installation of cutoff walls) along the west levee of the NEMDC between the NEMDC Stormwater Pumping Station and Sankey Road; and levee raising and slope flattening along the west levee of the PGCC. The Fix-in-Place Alternative would be the same as the Adjacent Levee Alternative (Proposed Action), but the width of the adjacent levee along Reach A:16–20 of the Sacramento River east levee would be reduced by 15 feet.

Both action alternatives would also involve waterside erosion protection improvements along the PGCC and NEMDC South; conversion of the Brookfield borrow site to managed marsh and improvements to the adjacent Chappell Ditch and Drain; West Drainage Canal realignment and bank improvements; relocation of the Riego Road Canal and Vestal Drain; modifications to RD 1000 Pumping Plant Nos. 1A,1B, 6, and 8 and City of Sacramento Sump Pumps 58, 102, and 160; borrow site excavation and reclamation at the South Fisherman’s Lake Borrow Area, West Lakeside School Site, and the Triangle Properties Borrow Area; and landside vegetation removal in preparation for the levee improvements described above. The Fix-in-Place Alternative would require removal of vegetation on the waterside of the Sacramento River east levee in Reach A:16–20.

Fill material for levee construction would be excavated from sites in the South Fisherman’s Lake Borrow Area, the West Lakeside School Site borrow area, and the Triangle Properties Borrow Area (see Plates 2-7a, 2-17, and 2-13, respectively). Following excavation, the South Fisherman’s Lake Borrow Area would be returned to agricultural production. The Triangle Properties Borrow Area would be returned to agricultural production, although portions adjacent to the PGCC east levee would be converted to detention basins to store PGCC overflow. The West Lakeside School Site would be used for agricultural production or habitat. Some of these lands are bordered by active agricultural canals or ditches.

Planned construction activities would coincide with part of the rainy season. These activities have the potential to temporarily impair water quality if disturbed and eroded soil, petroleum products, or construction-related wastes (e.g., cement and solvents) are discharged into receiving waters or onto the ground where they can be carried into receiving waters. Soil and associated contaminants that enter receiving waters through stormwater runoff and erosion can increase turbidity, stimulate algae growth, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Accidental spills of construction-related substances such as oils and fuels can contaminate both surface water and groundwater. The extent of potential impacts on water quality would depend on the following factors: tendency for erosion of soil types encountered, types of construction practices, extent of the disturbed area, duration of construction activities, timing of particular construction activities relative to the rainy season, proximity to receiving water bodies, and sensitivity of those water bodies to construction-related contaminants.

Slurry that would be used for construction of new cutoff walls in the Sacramento River east levee, American River north levee, and the west levee of NEMDC North has a fluid consistency when being placed. Improper handling or storage could result in releases to nearby surface water, thereby degrading water quality.

Replacement of discharge pipes at the RD 1000 pumping plants and City of Sacramento sump pumps listed above would involve excavation and grading on the waterside of the Sacramento River east levee, American River north levee, and NEMDC west levee. These activities could result in discharge of sediment and construction-related substances such as oils and fuels into these waterways.

Excavated areas that fill with surface or groundwater during project construction (such as areas along the NEMDC west levee, the American River north levee, and the Sacramento River east levee) would require dewatering. Surface or groundwater extracted from dewatering operations typically contains high levels of suspended sediment and often high levels of petroleum products and other construction-related contaminants. This extracted water could be directly released to local receiving waters, thereby degrading water quality.
The potential for release of soil or construction-related materials into the NEMDC, the PGCC, the NCC, the West Drainage Canal, local drainages, and ultimately the American or Sacramento Rivers could adversely affect river water quality. This temporary construction-related impact is considered potentially significant. (Similar)

Mitigation Measure 4.6-a: Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions

The project proponent(s) shall file a Notice of Intent (NOI) to discharge stormwater associated with construction activity with the Central Valley RWQCB. Final design and construction specifications shall require the implementation of standard erosion, siltation, and good housekeeping BMPs. Construction contractors shall be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) and comply with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity (Order No. 2009-0009-DWQ). The SWPPP shall describe the construction activities to be conducted, BMPs that will be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that shall be conducted.

The SWPPP shall include the following:

► pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills),
► demonstration of compliance with all applicable Central Valley RWQCB standards and other applicable water quality standards,
► demonstration of compliance with regional and local standards for erosion and sediment control,
► identification of responsible parties,
► detailed construction timelines, and
► a BMP monitoring and maintenance schedule.

BMPs shall include the following:

► conduct all work according to site-specific construction plans that identify areas for clearing, grading, and revegetation so that ground disturbance is minimized;
► install silt fences near riparian areas or streams to control erosion and trap sediment, and reseed cleared areas with native vegetation;
► stabilize disturbed soils of the new or raised levees, existing levee removal areas, and borrow sites before the onset of the winter rainfall season; and
► stabilize and protect stockpiles from exposure to rain and potential erosion.

The SWPPP also shall specify appropriate hazardous materials handling, storage, and spill response practices to reduce the possibility of adverse impacts from use or accidental spills or releases of contaminants. Specific measures applicable to the project include, but are not limited to, the following:

► develop and implement strict on-site handling rules to keep potentially contaminating construction and maintenance materials out of drainages and other waterways;
conduct all refueling and servicing of equipment with absorbent material or drip pans underneath to contain spilled fuel, and collect any fluid drained from machinery during servicing in leak-proof containers and deliver to an appropriate disposal or recycling facility;

- maintain controlled construction staging and fueling areas at least 100 feet away from channels or wetlands to minimize accidental spills and runoff of contaminants in stormwater;

- prevent substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses;

- maintain spill cleanup equipment in proper working condition. Clean up all spills immediately according to the spill prevention and response plan;

- develop a slurry spill contingency plan to respond to a potential for bentonite slurry spill and prevent slurry from entering the Sacramento River, American River, the NEMDC, or the NCC; and

- immediately notify the California Department of Fish and Game (DFG) and the Central Valley RWQCB of any spills and cleanup procedures.

BMPs shall be applied to meet the “maximum extent practicable” and “best conventional technology/best available technology” requirements and to address compliance with water quality standards. A monitoring program shall be implemented during and after construction to ensure that the project is in compliance with all applicable standards and that the BMPs are effective.

The project proponent(s) shall also file an NOI to discharge construction wastewater from dewatering operations with the Central Valley RWQCB. Construction contractors shall be required to comply with the conditions of the general NPDES permit for construction dewatering and other low threat discharges to surface waters (Order No. R5-2008-0081).

The project proponent(s) shall demonstrate compliance with applicable City of Sacramento stormwater management and erosion control regulations:

- The City’s Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code), which includes preparing erosion, sediment, and pollution control plans for each construction phase and postconstruction, if necessary. The project’s grading plans shall be approved by the City of Sacramento Utilities Department.

- The City’s Stormwater Management and Discharge Control Code (Chapter 13.16 of the City Code), which regulates stormwater and prohibits nonstormwater discharges except where regulated by a NPDES permit.

Responsibility: Project proponent(s)

Timing: Prepare NOI and SWPPP before the start of project construction; implement SWPPP and BMPs during construction; and monitor effectiveness of measure during and at completion of construction

Enforcement: Central Valley RWQCB and City of Sacramento

Several technical studies have been conducted regarding water-quality control feature impacts on groundwater (e.g., California Stormwater Best Management Practices Handbooks prepared by the California Stormwater
Quality Association [DWR 2007]) and surface water (e.g., Truckee River Basin Stormwater Management Program-Program Years 2007–2012 [Lahontan RWQCB 2007]). These studies have determined that water-quality control features such as revegetation, erosion control measures, and detention and infiltration basins have been successful in avoiding water quality impacts (e.g., metals and organic compounds associated with stormwater are typically lost within the first few feet of the soil of the retention basins associated with groundwater). Technical studies associated with the Lahontan Development (residential and golf course development) demonstrated that the use of a variety of BMPs (e.g., source control, detention basins, revegetation, and erosion control) have been able to maintain surface water quality conditions in adjacent receiving waters (Martis Creek). Implementation of Mitigation Measure 4.6-a would reduce water quality impacts from temporary construction activities under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative because the project proponent(s) would conform with applicable local and state regulations regulating construction discharges, which would reduce temporary potentially significant impacts to a less-than-significant level. (Similar)

Impact 4.6-b: Impacts to Sacramento River Water Quality from Pleasant Grove Creek Canal Detention Basin Discharges

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, the detention basins and pumping stations in the area between the PGCC east levee and the Union Pacific Railroad would not be constructed and operated; therefore, no potential exists for the Phase 4b Project to degrade the water quality of the Sacramento River from area drainage water and agricultural tailwater runoff. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Impacts to water quality as a result of levee failure would be the same as described in Impact 4.6-a under the No-Action Alternative (Potential Levee Failure). The potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would involve upgrades to or the removal of five culverts that currently drain the area east of the PGCC by passing water under the canal to drainage ditches along the landside of the PGCC west levee. The purpose of these culverts is to drain the area east of the PGCC when the PGCC is experiencing high flows. To mitigate for the loss of a drainage outfall area for properties east of the PGCC, five detention basins would be constructed in the area between the PGCC east levee and the Union Pacific Railroad to provide replacement storage for drainage (as shown on Plate 2-13). Depending on the design of the detention basins, pumping stations may be needed to discharge water out of the basins and into the PGCC. The detention basins and pumping facilities would be sized to handle runoff volumes of a 10-day storm event to protect structures, although temporary flooding of agricultural fields may be allowed during such events. The PGCC conveys drainage water south to the NEMDC, which conveys drainage water from Dry Creek, Arcade Creek, and the PGCC to an outfall on the Sacramento River near the confluence of the Sacramento and American Rivers.

Depending upon the time of year, water that would be pumped from the detention basins into the PGCC would be either agricultural tailwater or stormwater from areas east of the PGCC. These waters may contain excessive concentrations of pesticides, herbicides, nutrients, disease-carrying microorganisms, or salts. Without treatment,
discharges from the detention basin pumping stations could degrade the water quality of the Sacramento River. This impact would be potentially significant. (Similar)

Mitigation Measure 4.6-b: Implement Best Management Practices and Comply with NPDES Permit Conditions for a Point-Source Discharge

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Prior to operation of the detention basin pumping stations for discharge of water into the PGCC (and ultimately the Sacramento River), the project proponent(s) shall file a report of waste discharge with the Central Valley RWQCB and comply with NPDES permit conditions for a point-source discharge.

Responsibility: Project proponent(s)

Timing: File report of waste discharge prior to operation of the detention basin pumping stations; implement BMPs during construction; and monitor effectiveness of BMPs during and at completion of construction.

Enforcement: Central Valley RWQCB

Implementing this mitigation measure would reduce to a less-than-significant level the potential impact of detention basin pump discharges violating waste discharge requirements or substantially degrading water quality in the Sacramento River. (Similar)

Impact 4.6-c: Effects on Water Quality from Groundwater Discharged by Relief Wells

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no relief wells would be installed; therefore, no potential exists for the Phase 4b Project to degrade water quality from groundwater discharged by relief wells. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Impacts to water quality as a result of levee failure would be the same as described in Impact 4.6-a under the No-Action Alternative (Potential Levee Failure). The potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

During major storm events, groundwater from relief wells used for seepage remediation under both action alternatives would be directed to existing RD 1000 or City of Sacramento pumping stations via pipes that would collect this drainage near the landside toe of seepage berms along Sacramento River east levee Reach A:16–19A. The water from the drainage pipe system, including the groundwater released from the relief wells, would ultimately be pumped into the Sacramento River. Groundwater may exceed contaminant levels under the Basin Plan’s water quality objectives. Information about the quality of the groundwater in the areas where the wells are proposed is limited, although DWR has reported that an area between the Airport and the Bear River to the north has high levels of TDS, chloride, sodium, bicarbonate, manganese, and arsenic. It should be noted that relief wells are typically drilled to a shallower depth (approximately 50 feet) than the groundwater wells used by DWR for
water sampling (200 feet deep or greater); therefore, the data from the sample wells in the Natomas Basin may not reflect the quality of water at the shallow depths that would be in contact with the proposed relief wells. In addition, during the high surface-water events in which the relief wells discharge, the groundwater would be highly diluted with water that has seeped under the levee from the Sacramento River. The actual quality of groundwater released by the relief wells would not be known until tests at or in the vicinity of potential well sites are conducted. Because the release of untreated groundwater into the Sacramento River could adversely affect river water quality, this impact would be **potentially significant.** *(Similar)*

**Mitigation Measure 4.6-c: Conduct Groundwater Quality Tests, Notify the Central Valley RWQCB, and Comply with the Central Valley RWQCB’s Waste Discharge Requirements and NPDES Permit**

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The project proponent(s), in coordination with RD 1000, shall ensure that groundwater in the vicinity of potential relief well locations near the Sacramento River east levee is tested during project design and before well construction to ensure that discharge of extracted groundwater does not exceed maximum contaminant levels specified in Title 22. The project proponent(s) shall provide the Central Valley RWQCB with the results of these water quality tests and a conceptual plan for how the relief wells will be used (e.g., extracting and discharging groundwater), and shall comply with any waste discharge requirements and the NPDES permit issued by the Central Valley RWQCB.

- **Responsibility:** Project proponent(s)
- **Timing:** During project design and before well construction
- **Enforcement:** Central Valley RWQCB

Implementing this mitigation measure would reduce the potential impact on water quality in the Sacramento River from relief well discharges to a **less-than-significant** level because groundwater quality tests would be conducted, notification to the Central Valley RWQCB would be provided, and the project proponent(s) would comply with the Central Valley RWQCB’s Waste Discharge Requirements and NPDES permit. *(Similar)*

**4.6.3 RESIDUAL SIGNIFICANT IMPACTS**

Because mitigation cannot be required for the No-Action Alternative, water quality impacts related to the continued exposure of the Natomas Basin to a significant risk of flooding are uncertain. Because of this uncertainty, the potential impacts remain too speculative for meaningful consideration.

With implementation of Mitigation Measures 4.6-a, 4.6-b, and 4.6-c, there would be no residual significant impacts associated with the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative related to temporary and short-term stormwater runoff, erosion or spills, long-term discharges from PGCC detention basins, and long-term relief well discharges because the project proponent(s) would comply with applicable NPDES permit conditions and conduct groundwater quality tests.
4.7 BIOLOGICAL RESOURCES

4.7.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.7.1.1 METHODOLOGY

This section presents the methodology used to assess the potential impacts of the Phase 4b Project on biological resources, including sensitive habitats, terrestrial special-status species, and fisheries and aquatic resources.

Impacts to biological resources resulting from implementation of the Phase 4b Project were analyzed based on data collected during field surveys and review of existing documentation that addresses biological resources on or near the Phase 4b Project area. Biologists conducted multiple reconnaissance-level surveys of the project area during 2004–2009 as part of NLIP-related studies and planning efforts. Specific documents reviewed to support the analysis in this section include the NBHCP (City of Sacramento, Sutter County, and TNBC 2003); TNBC’s annual monitoring reports; and multiple draft and USACE-verified wetland delineation reports that cover portions of the Phase 4b Project area (see Section 3.7.2.2, “Sensitive Biological Resources,” under “Sensitive Aquatic Habitats”).

The methodology used to preliminarily identify irrigation, drainage, and field canals and ditches within the Phase 4b Project area is consistent with the USACE-approved delineation methodology. Consistent with the overall approach to this document and for purposes of NEPA and CEQA compliance, the analysis of jurisdictional wetlands presented below encompasses all known potential borrow sites for the Phase 4b Project, including some that may not be used for the project. In addition to the potential impacts at the identified borrow sites, if any additional borrow sites are needed, they would need to be analyzed under separate supplemental environmental compliance documentation.

The California Natural Diversity Database ([CNDDB] 2009), the NBHCP, and TNBC monitoring reports were used as the primary sources to identify previously reported occurrences of special-status species in the project area and vicinity.

Impacts resulting from levee improvement activities were based on the assumption that disturbance could occur within a worst-case levee corridor footprint in Sacramento River east levee Reach A:16–20 that would be up to 460 feet wide under the Adjacent Levee Alternative (Proposed Action) and up to 445 feet wide under the Fix-in-Place Alternative. Worst-case footprints for the Phase 4b Project are shown in Plates 2-7a, 2-7b, 2-9, 2-11, 2-13, 2-14, 2-16, and 2-17. It is likely that in many cases, however, engineering refinements, including measures to minimize habitat impacts, would reduce these worst-case levee corridor footprints further. Therefore, impacts in this section likely overestimate the magnitude of impacts associated with the levee footprint, which is permitted under NEPA and CEQA to ensure that the EIS/EIR does not underestimate the magnitude and intensity of anticipated impacts.

Natomas Levee Improvement Program Programmatic Conservation Strategy

The impact analysis methodology also considers the NLIP’s programmatic conservation strategy developed by USACE and SAFCA, in consultation with other affected regulatory agencies, to offset impacts to sensitive habitats and special-status species that may be temporarily or permanently affected by the overall NLIP (Phase 1–4b Projects).

As discussed in Section 2.3.4, “Habitat Improvements,” the programmatic conservation strategy would, in its entirety, substantially contribute toward the establishment of a valuable habitat reserve in the increasingly urbanized landscape of the Natomas Basin. The conservation strategy takes advantage of a unique opportunity provided by the NLIP, including the Phase 4b Project, to reconfigure and protect large nodes of habitat and connective corridors in the Basin at a landscape scale that would help to advance the goals and objectives of the
The conservation strategy has four primary goals:

1. Increase the amount of protected habitat and habitat corridors available for NBHCP-covered species.
2. Consolidate large areas of habitat to assist in the expansion of TNBC reserve blocks in the northwestern and southwestern regions of the Basin.
3. Improve the connectivity between core habitat reserves and other existing natural habitats distributed throughout the Basin, improve linkages between isolated wildlife populations, and substantially increase acreage and patch size of these critical habitats.
4. Meet regulatory compensatory mitigation requirements.

To meet these goals, managed marsh, managed grasslands, canals and associated uplands, valley oak woodlands and savannah, rice fields, and agricultural field crops would be preserved and/or created as part of the NLIP, including the Phase 4b Project. These elements provide important habitat for NBHCP-covered species, including aquatic and upland habitat for giant garter snake and other aquatic species, nesting and foraging habitat for Swainson’s hawk and other raptors, and potential habitat for valley elderberry longhorn beetle.

Key programmatic conservation strategy elements relating to giant garter snake include:

► creating the GGS/Drainage Canal and improvements to the West Drainage Canal to enhance habitat functionality by linking known concentration of giant garter snakes in the Basin and TNBC properties in the northern and southern reserve areas that are managed for giant garter snake habitat,

► reclaiming and preserving existing rice fields within the Basin to compensate for any temporary losses of habitat, and

► creating managed marsh in the vicinity of Fisherman’s Lake to expand and consolidate marsh habitat on TNBC preserves in the area and to compensate for permanent effects to rice fields and aquatic and upland features considered giant garter snake habitat.

Key programmatic conservation strategy elements relating to Swainson’s hawk include:

► retaining the mature riparian tree corridor along the Sacramento River east levee and the NCC, which provide important nesting habitat for Swainson’s hawk;

► increasing woodland acres, patch size, and connectivity (including creation of potential nesting habitat near Swainson’s hawk foraging habitat); and

► preserving and creating foraging habitat (including grassland and agricultural upland).
Implementation of the NLIP conservation strategy would result in a net gain in aquatic habitat for giant garter snake (including canals, rice, and managed marsh); a net gain in foraging habitat (overall acreage of grassland and upland agriculture) for Swainson’s hawk; and a net gain in woodlands that would provide more potential nesting and perching habitat for Swainson’s hawk in the Basin than currently exists, and bring potential nesting and perching sites in closer proximity to areas that are managed as foraging habitat for this species in the Basin.

Although land acquisition and habitat preservation is a key component of the NLIP, including the Phase 4b Project, the primary benefit of the NLIP programmatic conservation strategy is the increased functionality and connectivity of habitat in the Natomas Basin. The NLIP, including the Phase 4b Project, would contribute to the large-scale conservation planning and substantial Basin-wide benefits to NBHCP-covered species through providing substantially better quality habitat. Examples include:

- designing new and replacement canals that require less maintenance, and thus less disturbance, through increased canal flow capacity and reduced erosion resulting from higher stability 3H:1V slopes;
- securing water supply for managed marshes and canals through long-term contracts with NCMWC;
- installing rock pile refugia and expanding upland banks along the new GGS/Drainage Canal providing giant garter snake habitat;
- improving precise and dependable water level control for managed marshes and canals provided by check structures and operational criteria;
- enhancing the West Drainage Canal, which currently provides low-quality habitat;
- preserving rice and agricultural field crops to the benefit of NBHCP-covered species in the Basin;
- creating landside woodland corridors; and, most of all,
- creating permanent linkages between giant garter snake populations in the southern and northwestern portions of the Basin.

These benefits would substantially reduce the collective impacts of the NLIP, including the Phase 4b Project, and would create a larger contiguous area protected and managed for giant garter snake, valley elderberry longhorn beetle, Swainson’s hawk, and other NBHCP-covered species than currently exists.

Table 4.7-1 provides, by project phase, the habitat acreages that would be temporarily and permanently affected by implementation of the NLIP, and also shows the habitat acreages that would be preserved and/or created to compensate for temporary construction-related and permanent project footprint impacts. This information provides context to the overall impact assessment. The acreage estimates in Table 4.7-1 are summarized for the Adjacent Levee Alternative (Proposed Action) only; impacts to habitat for all alternatives under consideration are addressed in Section 4.7.2 for each impact area.

As discussed in Section 2.3.4, “Habitat Improvements,” the NLIP includes overall habitat conservation goals and strategies and improvements specific to each project phase. The following analysis considers the Phase 4b Project at a project level, as well as implementation of the NLIP programmatic conservation strategy covering all of the project phases. The programmatic biological opinion (BO) and project-level amended BO issued by the USFWS (Appendix D1), and the Phase 2 Project California Fish and Game Code Section 2081 incidental take permit issued by DFG, considered the entire NLIP habitat conservation strategy. Specific elements of the Phase 2 Project were included in the programmatic permitting documents, and subsequent project-level permits have been issued for the Phase 3 Project and will be issued for the Phase 4a and 4b Projects. The Phase 4b Project will require issuance of a project-level BO and a Section 2081 incidental take permit. This approach was used because elements of the conservation strategy implemented in earlier phases of the NLIP included compensation for
### Table 4.7-1

Habitat Impacts, Creation, and Preservation for the Natomas Levee Improvement Program by Project Phase

<table>
<thead>
<tr>
<th>Species/Habitat Type</th>
<th>Temporary Habitat Loss</th>
<th>Permanent Habitat Loss</th>
<th>Permanant Habitat Creation/Preservation</th>
<th>Permanant Habitat Net Gain/Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project Phase</td>
<td>Project Phase</td>
<td>Project Phase</td>
<td>Project Phase</td>
</tr>
<tr>
<td></td>
<td>2 3 4a 4b</td>
<td>2 3 4a 4b</td>
<td>2 3 4a 4b</td>
<td>2 3 4a 4b</td>
</tr>
</tbody>
</table>

#### Giant Garter Snake Habitat

<table>
<thead>
<tr>
<th></th>
<th>2 3 4a 4b</th>
<th>2 3 4a 4b</th>
<th>2 3 4a 4b</th>
<th>2 3 4a 4b</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canals – aquatic</td>
<td>0.5 5.5 4 35 9 9 6 23</td>
<td>12.5 12.5 10.2 13</td>
<td>3.5 3.5 4.2 10</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>Canals – associated upland</td>
<td>21 36 1 48 3 6 - 58</td>
<td>9 27 48 10</td>
<td>26 21 48 42</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>Non-canal aquatic/upland habitat (i.e., temporary impacts to rice)</td>
<td>180 - 48 145</td>
<td>23 45 1 259</td>
<td>100</td>
<td>Up to 90</td>
<td></td>
</tr>
<tr>
<td>Non-canal aquatic/upland habitat (i.e., permanent impacts to rice or created detention basins and managed marsh)</td>
<td>- - -</td>
<td>- - 23</td>
<td>55</td>
<td>-59</td>
<td></td>
</tr>
</tbody>
</table>

#### Swainson’s Hawk Habitat

<table>
<thead>
<tr>
<th></th>
<th>2 3 4a 4b</th>
<th>2 3 4a 4b</th>
<th>2 3 4a 4b</th>
<th>2 3 4a 4b</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field/row crop</td>
<td>- - - - 309 163 111 473 82</td>
<td>90</td>
<td>Up to 60</td>
<td>127</td>
<td>- -73</td>
</tr>
<tr>
<td>Grassland/ruderal</td>
<td>- - - 27 370 162 65 66 171</td>
<td>330 260 287 161</td>
<td>168 195 221</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>Landside woodlands</td>
<td>- - - - 15 35 18 36</td>
<td>61 21 78 72</td>
<td>46 -14 60 35</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>Waterside riparian woodland</td>
<td>- - - - 0.5 1.4 3.64 7</td>
<td>- - - -</td>
<td>-0.5 -1.4 -3.64</td>
<td>Up to -7</td>
<td></td>
</tr>
</tbody>
</table>

#### Notes:

- Net gain = acres permanent habitat loss – acres permanent habitat creation/preservation
- GGS = giant garter snake; NEMDC = Natomas East Main Drainage Canal; O&M = operations and maintenance; PGCC = Pleasant Grove Creek Canal
- Assumes up to 200 acres of rice would be converted to managed marsh at the Brookfield property; excavation of the Brookfield borrow site was analyzed in the Phase 2 EIR and EIS.
- No-net-loss of habitat function because of concurrent conversion to managed marsh and subsequent long-term management, as part of the Phase 4a Project.
- 147 acres of detention basin would be created from rice habitat in the Triangle Properties Borrow Area; total impacts to rice within the Natomas Basin would be 84.45 acres.
- The combined total acreage for field/row crop created/preserved as part of the Phase 3 and 4a Projects (which could occur as part of one or both of these project phases) would be 60 acres, which would combine with the 90 acres created/preserved as part of the Phase 2 Project to reach a total of 150 acres for the Phase 2, 3, and 4a Projects.
- Grassland/ruderal habitat created includes levee slopes and seepage berm along the Sacramento River east levee Reach A:16–18B and the newly created levee slopes along the NEMDC. Swainson’s hawk foraging habitat does not include the O&M corridor at the levee toe. No Swainson’s hawk foraging habitat would be created along the PGCC because the impacts to habitat are calculated only on the Phase 4b Project, subtracting out the Phase 3 Project footprint. The O&M corridor along the PGCC would encroach on the Phase 3 Project footprint, resulting in only developed habitat (the new O&M corridor) within the Phase 4b Project footprint along the PGCC.
- Waterside riparian woodland removal would occur along the west levee of NEMDC North and NEMDC South; and within the project footprint for RD 1000 Pump Plant Nos. 1A and 1B, and City Sumps 160, 120, and 58.

Source: Estimates calculated by AECOM in 2010
impacts from future project phases (including the Phase 4a and 4b Projects), and habitat creation and preservation that is part of the Phase 4b Project may provide compensation for impacts to habitat disclosed in environmental documents for the previous project phases.

4.7.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact if they would do any of the following:

► interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

► have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS;

► substantially reduce the habitat of a fish species or cause a fish species to drop below self-sustaining levels;

► have a substantial adverse effect on native woodland habitats;

► have a substantial adverse effect on waters of the United States, including wetlands; or

► conflict with the provisions of the NBHCP.

4.7.2 IMPACTS AND MITIGATION MEASURES

Impact 4.7-a: Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, there would be no Phase 4b Project improvements to the Natomas perimeter levee system. Conformance with USACE guidance regarding levee encroachments, however, could require removal of riparian vegetation and woodlands (see Table 4.7-2 for acreage) on the waterside of the Sacramento River east levee Reach A:16–20 and the NEMDC west levee; waterside riparian woodlands are not present along the PGCC. In addition, compliance with this guidance would also require removal of landside vegetation along Sacramento River east levee Reach A:16–20, American River north levee Reach I:1–4, and the NEMDC west levee. These woodland habitats provide important wildlife habitat and movement corridors and contribute to Shaded Riverine Aquatic (SRA) habitat functions important for fish. Removal of waterside riparian woodland habitat would adversely affect important SRA habitat, including moderation of water temperatures, recruitment of woody debris, and introduction of insects that provide food for aquatic species. Removal of this habitat would also adversely affect terrestrial wildlife that use riparian woodlands, including Swainson’s hawks that frequently nest in waterside woodlands. This impact would be potentially significant. (Greater)
<table>
<thead>
<tr>
<th>Location</th>
<th>No-Action Alternative (acres)</th>
<th>Adjacent Levee Alternative (Proposed Action) (acres)</th>
<th>Fix-in-Place Alternative (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Landside Woodland Removal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento River east levee (Reach A:16–20)</td>
<td>0.05</td>
<td>25.62</td>
<td>24.42</td>
</tr>
<tr>
<td>American River north levee (Reach 1:1–4)</td>
<td>6.91</td>
<td>6.91</td>
<td>6.91</td>
</tr>
<tr>
<td>West levee of NEMDC North</td>
<td>0.11</td>
<td>0.46</td>
<td>0.46</td>
</tr>
<tr>
<td>West levee of NEMDC South</td>
<td>1.98</td>
<td>1.98</td>
<td>1.98</td>
</tr>
<tr>
<td>Alignment of relocated West Drainage Canal</td>
<td>No impact</td>
<td>1.02</td>
<td>1.02</td>
</tr>
<tr>
<td>Subtotal</td>
<td>9.05</td>
<td>35.99</td>
<td>34.79</td>
</tr>
<tr>
<td><strong>Waterside (SRA) Woodland Removal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento River east levee (Reach A:16–20)</td>
<td>19.2</td>
<td>No impact</td>
<td>19.2</td>
</tr>
<tr>
<td>American River north levee – without variance (Reach 1:1–4; Reach H from Northgate Boulevard to Arden-Garden Connector)</td>
<td>6.11</td>
<td>6.11</td>
<td>6.11</td>
</tr>
<tr>
<td>American River north levee – with variance (Reach 1:1–4; Reach H from Northgate Boulevard to Arden-Garden Connector)</td>
<td>No impact</td>
<td>No impact</td>
<td>No impact</td>
</tr>
<tr>
<td>West levee of NEMDC North</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>West levee of NEMDC South – without variance</td>
<td>1.15</td>
<td>1.31</td>
<td>1.31</td>
</tr>
<tr>
<td>West levee of NEMDC South – with variance</td>
<td>0.57</td>
<td>0.73</td>
<td>0.73</td>
</tr>
<tr>
<td>City Sump 160</td>
<td>No impact</td>
<td>0.28</td>
<td>0.28</td>
</tr>
<tr>
<td>City Sump 102</td>
<td>No impact</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>City Sump 58</td>
<td>No impact</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>RD 1000 Pumping Plant Nos. 1A and 1B</td>
<td>No impact</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Subtotal</td>
<td>25.89</td>
<td>7.32</td>
<td>26.52</td>
</tr>
<tr>
<td><strong>Total Losses (approximate)</strong></td>
<td>35 acres</td>
<td>43 acres</td>
<td>61 acres</td>
</tr>
</tbody>
</table>

Notes: NEMDC = Natomas East Main Drainage Canal; RD = Reclamation District; SRA = Shaded Riverine Aquatic habitat; USACE = U.S. Army Corps of Engineers

1 All entries under No-Action Alternative assume that woodlands within 15 feet of the existing levee toe would be removed to comply with USACE levee vegetation requirements. All entries under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative assume that woodlands along the landside would be removed within the project footprint, including 15 feet from the landside toe of the widened levee.

2 Assumes a variance is granted and woodlands are only removed from the crown of the levee to the upper 1/3 of the waterside slope, unless otherwise noted.

3 Assumes that by moving the designated levee section landward, the adjacent levee design would create a hypothetical waterside levee slope that has a perpendicular separation of at least 5 feet from the waterside slope of the existing levee. The zone created by this separation contains the root structure of the woody vegetation on the waterside slope of the existing levee and allows the adjacent levee section to retain the safety, structural stability and functionality of a traditionally designed vegetation free levee section. The adjacent levee design thus reduces the conflicts between applicable USACE levee operation and maintenance requirements and waterside vegetation and structural encroachments.

4 Assumes a worst-case scenario that no variance from USACE levee vegetation guidance is granted and the upper 2/3 of the waterside levee slope must be cleared.

5 Assumes a variance from USACE Engineering Technical Letter such that no waterside vegetation removal would be required.

6 Assumes removal of riparian woodlands from the waterside levee crown to within 15 feet of the waterside levee toe. Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, an additional 0.16-acre of woodland would be removed from the waterside of NEMDC South as required for the placement of erosion protection.

7 Assumes a variance from the USACE engineering technical letter regarding levee vegetation such that only the waterside slope to the levee toe would have to be cleared. Approximately 18 trees would be removed. Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, an additional 0.16-acre of woodland would be removed from the waterside of NEMDC South as required for the placement of erosion protection.

8 Assumes the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, an additional 0.16-acre of woodland would be removed from the waterside of NEMDC South as required for the placement of erosion protection.

9 Assumes a worst-case scenario of woodland removal with no variance along the NEMDC South west levee.

10 Approximate losses are calculated using the worst-case scenario for waterside woodland removal.

Source: Estimates calculated by AECOM in 2010 based on construction data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009.
Potential Levee Failure

Without Phase 4b improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely or beneficially affect woodland habitats and SRA habitat, depending on timing, location, and duration of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of the impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

Landside woodlands and waterside (riparian) woodlands in and adjacent to the Natomas Basin are considered sensitive habitats. They provide important nesting and roosting habitat for a wide variety of wildlife species (including special-status species such as Swainson’s hawk) and serve as movement corridors for these species within the Basin. Waterside woodlands in particular are rich in biological fauna and flora and provide the primary source of nesting habitat for Swainson’s hawk in the Natomas Basin. Waterside woodlands on the Sacramento River also provide SRA habitat function, which is important for fish and other Sacramento River aquatic resources.

SRA habitat includes the near shore aquatic habitat occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this cover type are: (1) an adjacent bank composed of natural, eroding substrates supporting riparian vegetation that either overhangs or protrudes into the water; and (2) water that contains variable amounts of woody debris, such as leaves, logs, branches, and roots and has variable depths, velocities, and currents. SRA habitat provides structure and food for various fish species. Shade decreases water temperatures, while low overhanging branches can provide sources of food by attracting terrestrial insects. As riparian areas mature, the vegetation sloughs off into the rivers, creating structurally complex habitat consisting of large woody debris that furnishes refugia from predators, creates higher water velocities, and provides habitat for aquatic invertebrates. For the Phase 4b Project, SRA loss is estimated as the acreage of canopy coverage from any trees or shrubs (woodlands) on the waterside of the existing Sacramento River east levee, American River north levee, or NEMDC waterside levee that would be affected by construction activities or compliance with USACE guidance regarding levee encroachments. Woody vegetation along the waterside of the PGCC and NCC does not qualify as SRA habitat because special-status fish species (i.e., anadromous salmonids) have limited access to these channels because of passage obstacles and the channels do not serve as migration pathways to upstream habitat areas. Further, the habitat quality in these waterways is limited by several other factors including water quality and warm water temperatures.

The Adjacent Levee Alternative (Proposed Action) would include removal of woodlands as follows: (1) on the landside of the Sacramento River east levee in the proposed adjacent levee footprint (Reach A:16–20); (2) on the landside and waterside of the American River north levee Reach I:1–4 and (3) on the landside and waterside along the NEMDC west levee as required for the levee modifications; (4) Sacramento River east levee, NEMDC west levee, and PCGG southwest levee as required for pumping plant modifications; and (5) in the footprint of the realigned West Drainage Canal. Table 4.7-2 presents these impacts.

Impacts from loss of woodlands include short-term effects that would occur during the period it takes replacement plantings to mature. Although woodland habitat would be created to compensate for the loss of woodlands, replacement plantings do not provide habitat functions equivalent to the mature woodlands that would be removed for a minimum of 10–15 years. In the case of Heritage oaks, it would take several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed, which in some cases are likely 100 years old or older. Long-term impacts take into consideration compensation provided by replacement plantings, once created woodlands provide functional replacement habitat.
Temporal Loss (Minimum 10–15 Years) of Landside and Waterside Woodland Habitats (Except Heritage Oaks)

Construction of the adjacent levee under the Adjacent Levee Alternative (Proposed Action) would reduce the potential need to remove waterside woodlands (including those that provide SRA habitat function) along Sacramento River east levee Reach A:16–20 to meet USACE levee guidelines on vegetation clearance because it would shift the Sacramento River east levee prism landward. The Adjacent Levee Alternative (Proposed Action) would nevertheless result in the need for removal of several landside woodland groves and individual trees (see Table 4.7-2 for acreages). It is anticipated that the small areas of woodlands that occur in the Triangle Properties Borrow Area can be avoided and that borrow activities would not result in loss of woodlands. In addition, as described in Section 2.3.1, “Flood Risk Reduction Components,” the project proponent(s) would take measures to reduce and avoid impacts to Heritage oaks where feasible under levee design and seepage remediation performance requirements.

On the waterside of the levees that are part of the proposed Phase 4b Project, modifications to RD 100 Pump Plant Nos. 1A and 1B and City Sump 160 along the existing Sacramento River east levee, City Sump 58 along the American River, and RD 1000 Pump Plant Nos. 6 and 8, and City Sump 102 along the NEMDC would require removal of small amounts of riparian vegetation or woody material (see Table 4.7-2 for acreages). Removal of riparian vegetation or woody material would also occur at erosion sites location on the NEMDC. Additionally, riparian vegetation and woody material along the waterside of the NEMDC west levee could potentially be removed to satisfy vegetation removal requirements of USACE encroachment policy. If implemented, this would result in the loss of individual trees that may provide SRA habitat function. The potential loss of trees (and associated potential SRA habitat) would result in reduced quality and quantity of important habitat for fish species and/or their prey species and potential nest trees for Swainson’s hawks.

The Phase 4b Project would offset the loss of landside woodlands by preserving and creating landside woodlands (see Table 4.7-3 for acreages); however, there would be a temporal loss of woodland habitat as the replacement plantings mature within a minimum 10–15 years, not including Heritage oaks, which require up to 100 years to reach maturity. This temporal impact due to loss of existing woodland habitat while the replacement plantings are maturing would be significant.

Long-Term and Permanent Impacts Due to Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats

The plan for compensation for impacts to landside woodland would include transplanting suitable trees from the Phase 4b Project area, where feasible, as well as planting a variety of native tree species to create woodland habitat. Potential sites for plantings to compensate for landside woodland impacts would include locations along Reach A:16 of the Sacramento River east levee, and along Lower Dry Creek, immediately east of the NEMDC.

These proposed compensatory measures would complement woodland preservation and creation activities carried out as part of the programmatic compensation strategy for the NLIP as shown in Table 4.7-3. When completed, the programmatic conservation strategy would result in a net gain in the amount of woodland habitat in the Natomas Basin. In addition, the conservation strategy would result in increased woodland grove size and connectivity, which would provide higher-quality habitat for fish and wildlife species that depend on woodlands and oak savannah. However, if habitat creation/preservation is not effectively implemented, the long-term loss of woodlands (including Heritage oaks) would result in a potentially significant impact.
### Table 4.7-3

Estimated Phase 4b Project Impacts on Woodlands and Shaded Riverine Aquatic Habitats Following Compensation

<table>
<thead>
<tr>
<th>Project Activity</th>
<th>Phase 4b Project Alternatives (acres)</th>
<th>Programmatic NLIP (Proposed Action–All Project Phases)¹ (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No-Action Alternative</td>
<td>Adjacent Levee Alternative (Proposed Action)</td>
</tr>
<tr>
<td>Landside</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodlands removed</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>Woodlands preserved</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Woodlands created</td>
<td>0</td>
<td>72</td>
</tr>
<tr>
<td><strong>Total Compensation</strong></td>
<td>0</td>
<td>Up to 72</td>
</tr>
<tr>
<td><strong>Net Gain or (Loss)</strong></td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Waterside</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodlands removed²</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total Compensation³</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Net (Loss)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Net Gain = Woodland Loss - (woodlands preserved + woodlands created)
NEMDC = Natomas East Main Drainage Canal; NLIP = Natomas Levee Improvement Program

¹ Programmatic NLIP acreages are based on impacts calculated in Table 6 of the Phase 4a Biological Assessment for impacts resulting from the Phase 2, 3, and 4a Projects; and includes impacts from the Phase 4b Project.

² Includes removal of waterside riparian woodland (assumes worst-case) that could potentially be affected by implementation of the USACE encroachment policy for the NEMDC west levee (approximately 17.35 acres) and project-related impacts. This portion of the impact would not result from construction-related impacts. Assumes that the Sacramento River east levee, American River north levee, and the portion of the NEMDC west levee between Northgate Boulevard and the Arden-Garden Connector would be wide enough under the Adjacent Levee Alternative (Proposed Action) that waterside woodland removal would not be required.

³ Waterside woodlands (SRA) would not be created under the Phase 4b Project. However, 3.5 acres of waterside woodlands (SRA) was planted as part of the Phase 3 Project.

Source: Data compiled by AECOM in 2010

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**Fix-in-Place Alternative**

The Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action), except that no adjacent levee would be constructed along Sacramento River east levee Reach A:16–20; instead, the existing levee would be widened in place. Under this alternative, however, in addition to the removal of landside woodland on the Sacramento River east levee, mature riparian woodland vegetation (i.e., trees and shrubs) along the waterside of the levee that provides SRA function would likely be removed to degrade the levee crown to construct cutoff walls and to conform with USACE guidance regarding levee encroachments (see Table 4.7-2 for acreages).

The adverse effects of vegetation removal for the Fix-in-Place Alternative would be greater than under the Adjacent Levee Alternative (Proposed Action), particularly in terms of the quality of the habitat lost, but also in the amount of habitat lost. The loss of waterside riparian woodlands, including those that provide SRA habitat functions on the Sacramento River, would be much greater compared to that under the Adjacent Levee Alternative (Proposed Action).
The extensive riparian vegetation removal associated with the Fix-in-Place Alternative could substantially and adversely affect the wildlife that depend on waterside riparian woodlands for foraging and nesting habitat and could substantially adversely affect SRA habitat functions important for fish, including special-status fish. This impact would be significant. (Greater)

Mitigation Measure 4.7-a: Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code

To reduce impacts on woodland habitat, the project proponent(s) shall implement the following measures, which shall be in compliance with USACE levee vegetation guidance:

- Native woodland areas shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing shall be used during construction to prevent disturbance of native trees that are located adjacent to construction areas but can be avoided.

- The project proponent(s) shall coordinate with USFWS, National Marine Fisheries Service (NMFS), DFG, and the Sacramento County Airport System (SCAS) (if on Airport property) to ensure that all woodland habitat improvements of the NLIP are created and managed. The project proponent(s) shall prepare a project-specific Mitigation and Monitoring Plan (MMP) and append the programmatic Long-Term Management Plan (LTMP) to ensure the creation and long-term management of these components before construction commences. The project proponent(s) shall enter into agreements with the appropriate local entity responsible for long-term management of these created woodland habitats and shall coordinate with USFWS, NMFS, and DFG to ensure that performance criteria and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the MMP and LTMP. All performance criteria and long-term management goals will be in full compliance with the Endangered Species Act (ESA) and California Endangered Species Act (CESA). The project proponent(s) shall implement all terms and conditions of the agreements.

- Waterside riparian woodland along the Sacramento River, American River (e.g., Lower American River Mile 0.5 mitigation site), and NEMDC that provide SRA habitat functions shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of such areas to the extent feasible. Temporary fencing shall be used during construction to prevent disturbance of trees and shrubs that are located adjacent to construction areas but can be avoided.

- Waterside riparian forest and scrub (canopy acreage) shall be replaced using ratios established by NMFS. Mitigation shall be 1:1 for in-kind mitigation and 3:1 for out-of-kind mitigation. For example, if waterside removal of vegetation occurs on the lower portion of the levee slope below the ordinary high water mark (OHWM) and mitigation planting sites are only available above the levee bench hinge (located at the top of the lower slope), then mitigation shall increase to 3:1. Mitigation shall be conducted using native plant species, including an assemblage of grasses, sedges, shrubs, and trees. At
The riparian vegetation community would provide SRA functions. The project proponent(s) shall develop a detailed woodland planting design and management protocols in coordination with USFWS, NMFS, and DFG. A monitoring plan with performance criteria shall be developed and implemented to determine the progress of the woodland habitats towards providing adequate mitigation.

- The criteria for measuring performance shall be used to determine if the habitat improvement is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria shall be developed in consultation with USFWS, NMFS, and DFG, and shall include, but not be limited to:
  - percent survival of planted trees (from 65–85%),
  - percent survival of transplanted trees (from 60–85%), and
  - percent relative canopy cover (from 5–35%).

- The project proponent(s) shall also enter into agreements with entities responsible for long-term management of created SRA habitats to ensure that performance criteria and long-term management goals are met. The project proponent(s) shall provide assurances for habitat creation and management goals that are required by regulatory agencies with jurisdiction over these resources, and these assurances will be specifically detailed and outlined in the LTMP and MMP. Such agreements shall be coordinated with USFWS, NMFS, and DFG. The project proponent(s) shall implement all terms and conditions of the agreements.

- If SRA mitigation requirements cannot be met through restoration on-site, credits shall be purchased at a mitigation bank approved by the resource agencies (e.g., USFWS, NMFS, and DFG) for selling SRA credits.

- A Section 1602 Streambed Alteration Agreement from DFG shall be obtained before any trees within a stream zone under DFG jurisdiction are removed. The project proponent(s) shall comply with all terms and conditions of the streambed alteration agreement including measures to protect fish habitat or to restore, replace, or rehabilitate any SRA habitat on a no-net-loss basis.

- USACE shall initiate Section 7 consultation with NMFS under Section 7 of the Federal ESA, and the project proponent(s) shall consult or coordinate with DFG under CESA regarding potential impacts of the loss of SRA habitat on Federally listed fish species and state-listed fish species, respectively. The project proponent(s) shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes, including Section 2081 permit conditions, to ensure no net loss of SRA habitat functions.

**Responsibility:** Project proponent(s)  
**Timing:** Before construction

Implementing this mitigation measure, along with the habitat improvements included as part of the Phase 2, 3, and 4a Projects, would reduce the Phase 4b Project’s adverse effects on landside woodland habitat because the amount of landside woodlands that would be created and preserved as part of the Phase 2, 3, and 4a Projects along with woodland created as part of the Phase 4b Project would increase landside woodlands in the Basin (see Table...
The habitat improvements from mitigation implementation would reduce long-term impacts to landside woodland habitats loss to a less-than-significant level. However, this impact would remain significant and unavoidable for many years before reaching a less-than-significant level because replacement plantings would require a minimum of 10–15 years before providing important habitat components such as shade and structure and decades to replace old growth trees, such as Heritage oaks.

Impacts to woodlands and SRA habitat would remain significant and unavoidable for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because (1) replacement plantings would not reduce the temporary loss of mature trees to a less-than-significant level, and no feasible mitigation is available to fully reduce the magnitude of this impact; (2) replacement woodlands on the landside would not compensate for the extensive loss of mature waterside vegetation or for the loss of SRA habitat along the NEMDC and a portion of the American River north levee (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative), as well as along the waterside of Sacramento River east levee Reach A:16–20 under the Fix-in-Place Alternative; and (3) it may not be possible to create enough suitable SRA habitat to compensate for SRA losses, especially under the Fix-in-Place Alternative.

Impact 4.7-b: Disruption to and Loss of Existing Wildlife Corridors

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, there would be no Phase 4b Project improvements to the Natomas perimeter levee system. However, extensive removal of woodland located on the waterside of the Sacramento River east levee and NEMDC west levee would be required to conform with USACE guidance regarding levee encroachments (see Table 4.7-2). Removing a large portion of this riparian vegetation would adversely affect existing wildlife corridors by disrupting the movement and dispersal of the native birds and wildlife species that depend on woodland cover. This impact would be potentially significant. (Greater)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely affect wildlife corridors by direct mortality to migrating species or the destruction rearing locations, including den and nest sites. Levee failure could also result in beneficial affects to wildlife corridors by increasing debris piles which may provide forage or resting locations for some species. The impact of flood waters on wildlife corridors is dependent upon the timing, location, and duration of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether adverse or beneficial, is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

Disruption to and Loss of Aquatic Movement Corridors for Giant Garter Snake

Irrigation/drainage ditches and canals within the Phase 4b Project area and larger Natomas Basin serve as critical corridors for movement of aquatic species, particularly the giant garter snake. Adverse impacts on these corridors under the Adjacent Levee Alternative (Proposed Action) would consist of temporary disturbance and permanent loss of canals, ditches, and their associated habitat values due to filling, redesigning, and reconfiguring these facilities to accommodate project improvements.
Under the Adjacent Levee Alternative (Proposed Action), a small amount of canal habitat would be temporarily affected or permanently lost as a result of construction of proposed levee improvements along the Sacramento River east levee, NEMDC west levee, and PGCC west levee; and filling and relocating West Drainage Canal, Riego Road Canal, Vestal Drain, Morrison Drain, and portions of associated lateral supply pipes and private irrigation ditches (see Table 4.7-1). Along the PGCC west levee, the proposed levee raise overlaps with the footprint of the raise that was addressed as part of the Phase 3 Project, as shown in Plate 2-13. Only impacts from the increment of the Phase 4b Project footprint are addressed in Table 4.7-1. The relocation of the Riverside Canal was addressed as part of the Phase 4a Project EIS and EIR; however, the filling of the Riverside Canal to construct the adjacent levee along the Sacramento River east levee south of where the Phase 4a project ended is proposed as part of the Phase 4b Project and analyzed in this EIS/EIR. SAFCA, in consultation with USACE, proposes to offset temporary impacts to the existing West Drainage Canal, Riego Road Canal, Vestal Drain, and Morrison Drain through creation of the realigned and extended West Drainage Canal and the relocated Riverside Canal, which were analyzed under the Phase 4a Project in the Phase 4a EIS and EIR. The West Drainage Canal is expected to provide a higher habitat value relative to the canal that would be filled. The realigned West Drainage Canal would be designed to reduce maintenance requirements and resulting habitat degradation, and snake injury and mortality that could occur.

New canal habitat created as part of the programmatic conservation strategy of the NLIP (including creation of the GGS/Drainage Canal under the Phase 2 and Phase 3 Projects and proposed improvements to the West Drainage Canal as part of the Phase 4b Project) would provide new movement corridors for giant garter snake, partially offsetting the permanent loss of canal habitat. The configuration and preliminary design of these new corridors were specifically formulated to enhance giant garter snake movement opportunities between populations in the northern and southern portions of the Natomas Basin (see Section 2.3.4 for additional details). This is anticipated to provide an overall, long-term enhancement in the quality of aquatic movement corridors throughout the Basin. A detailed design of the West Drainage Canal is being developed by SAFCA, in consultation with USACE, and will be provided to USFWS and DFG for agency review. Protective mechanisms and specific management protocols are currently being prepared by SAFCA, in consultation with USACE and in coordination with USFWS and DFG. To provide adequate compensation for the canal habitat that would be lost, new canal and managed marsh habitat must be created and managed in a manner that provides the essential functions of habitat that would be lost. If this objective is not achieved, project impacts on aquatic movement corridors would be considered significant.

**Disruption to and Loss of Movement Corridors for Bird Species**

The existing woodland corridor along the landside of the Sacramento River east levee (Reach A:16–20), the waterside and landside of the American River north levee (I:1–4), and the waterside of the NEMDC west levee provides valuable nesting and rearing habitat for a variety of bird species. Under the Adjacent Levee Alternative (Proposed Action), substantial landside and waterside woodland would be removed (see Table 4.7-2 for acreages).

To offset this impact from the loss of landside woodlands, the Phase 4b Project would plant up to 60 acres of woodland in mitigation planting sites described in Section 2.3.4.2, “Woodland Compensation,” which would complement the woodlands created as part of NLIP programmatic conservation strategy, as shown in Table 4.7-3. However, this compensatory vegetation would not mature for a minimum of 10–15 years (and as long as 100 years for Heritage oaks), and its habitat value would therefore be limited in the near term when compared with the value of the existing landside woodlands that would be removed. The Adjacent Levee Alternative (Proposed Action) would leave the higher-quality waterside riparian woodland along Sacramento River east levee Reach A:16–20 largely undisturbed; thus, substantially preserving the integrity of the existing woodland corridors during the interim 10- to 15-year period while the new woodland plantings mature. The result of the Adjacent Levee Alternative (Proposed Action) (both at the project level and when considered in combination with the NLIP programmatic conservation strategy) would be a net increase in landside woodland habitat (see Table 4.7-3). Nevertheless, because of the time required for the woodland plantings to mature, especially to the level that would
replace Heritage oaks, and because the Phase 4b Project woodland planting program would not address the loss of waterside woodlands along the NEMDC, this impact would be potentially significant.

Fix-in-Place Alternative

Disruption to and Loss of Aquatic Movement Corridors for Giant Garter Snake

Impacts on the amount and quality of canal habitat under the Fix-in-Place Alternative would be the same as described for the Adjacent Levee Alternative (Proposed Action). Therefore impacts associated with the disruption to and loss of aquatic movement corridors is the same as described under the Adjacent Levee Alternative (Proposed Action). (Similar)

Disruption to and Loss of Movement Corridors for Bird Species

Under the Fix-in-Place Alternative, the loss of landside woodlands would be slightly less than under the Adjacent Levee Alternative (Proposed Action). However, because the adjacent levee would not be constructed under the Fix-in-Place Alternative, extensive removal of large woody vegetation from the riparian corridor on the waterside of the Sacramento River east levee (Reach A:16–20) would be required to conform with USACE guidance regarding levee encroachments. As a result, the total amount of woodland acreage removed in Reach A:16–20 of the Sacramento River east levee would be greater under the Fix-in-Place Alternative. The impacts to large woody vegetation under the Fix-in-Place Alternative along the American River north levee and NEMDC west levee would be the same as the Adjacent Levee Alternative (Proposed Action) (see Table 4.7-2). The American River north levee is overbuilt and it is expected that vegetation removal along the watershed would not be required under either the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative.

Removal of a substantial portion of riparian vegetation would adversely affect the movement and dispersal of the native birds and wildlife species that depend on woodland cover. Therefore, the Fix-in-Place Alternative could adversely affect wildlife movement corridors and this impact would be significant. (Greater)

Mitigation Measure 4.7-b: Implement Mitigation Measures 4.7-a, “Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code,” and 4.7-e, “Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Improvements and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, and Obtain Incidental Take Authorization”

To reduce impacts on wildlife corridors, the project proponent(s) shall implement Mitigation Measures 4.7-a, above, and 4.7-e, below.

<table>
<thead>
<tr>
<th>Mitigation Measures</th>
<th>Responsibility:</th>
<th>Timing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.7-a, above</td>
<td>Project proponent(s)</td>
<td>See Mitigation Measures 4.7-a and 4.7-e</td>
</tr>
<tr>
<td>4.7-e</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Implementing Mitigation Measure 4.7-a would ensure that significant adverse impacts on woodlands that provide wildlife movement corridors are minimized through the creation and preservation of landside woodlands, which would facilitate wildlife movement. These replacement woodlands would reduce effects on wildlife movement and dispersal to a less-than-significant level.

Implementing Mitigation Measure 4.7-e would ensure that significant adverse impacts on irrigation/drainage ditches and canals that provide wildlife movement corridors are minimized through the creation of replacement...
aquatic corridors, which would facilitate wildlife movement. Created canals that would serve as aquatic corridors would reduce effects on wildlife movement and dispersal to a **less-than-significant** level.

Implementing Mitigation Measures 4.7-a and 4.7-e would ensure that adverse effects on landside woodlands and irrigation/drainage ditches and canals that provide wildlife movement corridors are minimized through the creation of replacement woodland and aquatic corridors, which would facilitate wildlife movement. Created woodlands and canals along the landside would partially reduce the effects of wildlife movement and dispersal, but not to a less-than-significant level for impacts to landside woodlands and irrigation/drainage ditches and canals. However, because there is no known feasible mitigation that would adequately and fully compensate for the likely loss of waterside vegetation along the NEMDC South west levee under the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative and the Sacramento River east levee under the Fix-in-Place Alternative this impact would remain **significant and unavoidable. (Greater)**

**Impact 4.7-c: Direct and Indirect Impacts on Jurisdictional Waters of the United States**

Potential temporary and permanent impacts on jurisdictional waters of the United States resulting from the Phase 4b Project are identified in **Table 4.7-4**.

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, the Natomas perimeter levee system would not be improved as a result of the Phase 4b Project and the proposed landscape and irrigation/drainage system modifications would not be implemented. There would be **no impact** on waters of the United States under USACE jurisdiction. **(Lesser)**

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely or beneficially affect waters of the United States that occupy approximately 930 acres, or 1.7%, of the Basin (TNBC 2007). Because the exact level of impact would be dependent on the flooding duration, depth, rate, timing, and location, this impact is considered uncertain and a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration. (Currently Unknown)**

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

Three primary borrow sources have been identified for the Phase 4b Project: West Lakeside School Site, the South Fisherman’s Lake Borrow Area, and the Triangle Properties Borrow Area. The Phase 4b Project could also use borrow material from sources analyzed as part of the Phase 4a Project in the Phase 4a EIS and EIR—the Twin River Unified School District Stockpile Site, the Krumenacher Borrow Site, and the Fisherman’s Lake Borrow Area (see Section 4.1.3, “Summary of previous NEPA and CEQA Analyses of Borrow”). Under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, use of new Phase 4b Project borrow sites would require the permanent fill of waters of the United States including drainage ditches, irrigation canals, and irrigated wetlands. The total acreage of fill is not known at this time. Impacts associated with haul road construction across various drainage canals would be temporary, and these resources would be restored to pre-project conditions after project completion.
### Table 4.7-4
Estimated Potential Direct and Indirect Impacts of the Phase 4b Project on Jurisdictional Waters of the United States

<table>
<thead>
<tr>
<th>Project Feature</th>
<th>Functional Value</th>
<th>Adjacent Levee Alternative (Proposed Action)</th>
<th>Fix-in-Place Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Temporary Impact (acres)</td>
<td>Permanent Impact (acres)</td>
</tr>
<tr>
<td>Construction of Sacramento River east levee, American River north levee, NEMDC west levee(^2), and PGCC west levee(^2) Improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation and drainage ditches (fill)(^2)</td>
<td>Low</td>
<td>-</td>
<td>1.40</td>
</tr>
<tr>
<td>Wetlands (fill)(^2)</td>
<td>Low</td>
<td>-</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Construction of Erosion Repair</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation and drainage ditches (fill)(^2)</td>
<td>Low</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PGCC waterside erosion control rip rap (fill)</td>
<td>High</td>
<td>-</td>
<td>14.50</td>
</tr>
<tr>
<td>NEMDC waterside erosion control rip rap (fill)</td>
<td>High</td>
<td>-</td>
<td>5.49</td>
</tr>
<tr>
<td>Erosion repair (dewatering of PGCC)</td>
<td>High</td>
<td>14.50</td>
<td>-</td>
</tr>
<tr>
<td>Erosion repair (dewatering of NEMDC)</td>
<td>High</td>
<td>5.49</td>
<td>-</td>
</tr>
<tr>
<td><strong>Construction of Relocated West Drainage Canal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation and drainage ditches (fill)</td>
<td>Low</td>
<td>-</td>
<td>0.19</td>
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<tr>
<td>Irrigation ditches (Dewater of Existing West Drainage)(^3)</td>
<td>Low</td>
<td>12.96</td>
<td>-</td>
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<tr>
<td><strong>Construction of Relocated Riego Road Canal Vestal Drain, Morrison Canal, Chappell Ditch, and Private Irrigation</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation and drainage ditches (fill)</td>
<td>Low</td>
<td>-</td>
<td>0.02</td>
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<tr>
<td>Dewater of existing Riego Road canal</td>
<td>Low</td>
<td>-</td>
<td>0.68</td>
</tr>
<tr>
<td><strong>Construction of Flood Protection at SR 99</strong></td>
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<td></td>
</tr>
<tr>
<td>Dewater and fill of NCC</td>
<td>Low</td>
<td>0.69</td>
<td>0.69</td>
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<tr>
<td>Fill of seasonal wetland</td>
<td>Low</td>
<td>-</td>
<td>0.43</td>
</tr>
<tr>
<td>Fill of irrigated wetland(^4)</td>
<td>Low</td>
<td>&lt;27</td>
<td>&lt;27</td>
</tr>
<tr>
<td><strong>Replacement of RD 1000’s Pumping Plant Nos. 6 and 8 and City Sump Pumps 102 and 160</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake channel modification (dewater)</td>
<td>High</td>
<td>-</td>
<td>0.50</td>
</tr>
<tr>
<td>Sacramento River watershed outfall construction (fill)(^5)</td>
<td>High</td>
<td>-</td>
<td>0.03</td>
</tr>
<tr>
<td>NEMDC watershed outfall construction (fill)</td>
<td>High</td>
<td>-</td>
<td>0.76</td>
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<tr>
<td><strong>Borrow Site and Haul Road Construction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Fisherman’s Lake drainage ditches and canals (fill/dewater)</td>
<td>Low</td>
<td>-</td>
<td>1.38</td>
</tr>
<tr>
<td>West Lakeside School Site Borrow Area</td>
<td>Low</td>
<td>0.26</td>
<td>-</td>
</tr>
<tr>
<td>Irrigated wetlands in Triangle Properties Borrow Area (fill)(^6)</td>
<td>Low</td>
<td>&lt;290</td>
<td>&lt;147</td>
</tr>
<tr>
<td><strong>Total (approximate)</strong></td>
<td>324</td>
<td>199</td>
<td>324</td>
</tr>
</tbody>
</table>

Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; SR = State Route

1 Functional value definitions: High = Natural structure and function of biotic community maintained, with minimal changes evident. Moderate = Moderate changes in structure and function of biotic community—i.e., moderate level of disturbance. Low = Severe changes in structure and/or function of biotic community evident—i.e., high level of disturbance. See Section 3.3.7 in Chapter 3, “Affected Environment,” for additional information.

2 A portion of the Phase 4b Project area along the PGCC west levee overlaps within the previously analyzed Phase 3 EIS and EIR. Only impacts unique to the Phase 4b Project are reported here.

3 The entire West Drainage Canal would be dewatered for improvements; however, only a 3.99-acre/4,700-foot-long section would be relocated.

4 Chappell Ditch and Drain improvements would occur in areas that are currently in rice production; irrigated wetlands are generally a small component of actively farmed rice fields.

5 Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act authorizations are required for work on the waterside of the levee.

6 Approximately 290 acres of rice is present on the Triangle Properties Borrow Area; irrigated wetlands are generally a small component of actively farmed rice fields. Permanent impact assumes the worst-case scenario that 147 acres of shallow detention basins could not be returned to rice production.

Source: Data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009; data compiled by AECOM in 2010
A wetland delineation has not been completed for the Triangle Properties Borrow Area; however, it is expected that the rice fields in the Triangle Properties Borrow Area could contain irrigated wetlands. For the purposes of this analysis, the impacts described above are considered permanent. Vernal pools are present within the Triangle Properties Borrow Area on approximately 85 acres; areas with vernal pool complex would not be used for borrow source material and this habitat would remain undisturbed. The total acreage for temporary impacts noted in Table 4.7-4 is the potential acreage of temporary impacts if all borrow sites are completely disturbed within their excavation footprints, which is up to 290 acres (worst-case) within the larger borrow area.

Construction of the adjacent levee along Sacramento River east levee Reach A:16–20 under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would result in potential impacts to waters of the United States, including wetlands (fill of irrigation and drainage ditches). Impacts to waters of the United States, including wetlands, would also occur from:

- raising and widening the west levee of NEMDC North;
- bank protection in the PGCC and NEMDC (including relocation of the low-flow channel in NEMDC South);
- relocating irrigation ditches along the NCC south levee and the west levees of PGCC and NEMDC North; and
- removing culverts under the PGCC.

Fill associated with levee modifications would occur in irrigated wetlands along the PGCC and NEMDC. Fill of seasonal wetlands and vernal pools would occur along NEMDC North as a result of levee raising and widening. Relocation and extension of the West Drainage Canal, Riego Road Canal, Vestal Drain, and Morrison Canal would result in permanent fill of drainage and irrigation ditches, and irrigated wetlands in rice fields.

Under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, the discharge pipes associated with RD 1000’s Pumping Plant Nos. 1A and 1B along the Sacramento River east levee, Pumping Plant No. 6 along the NEMDC North, Pumping Plant No. 8 along the NEMDC South, City Sump 160 along the Sacramento River east levee, City Sump 102 along the NEMDC South, and City Sump 58 along the American River north levee would be replaced. Additionally, dewatering and new outfall construction would be required for all pumping plants except RD 1000 Pumping Plant Nos. 1A and 1B. Most of the outfalls would be placed above the OHWM and would not be expected to qualify as fill of waters of the United States under Section 404 of the CWA. Outfall installation, however, would result in temporary impacts due to dewatering within waters of the United States. The installation of these outfalls would result in the removal of some minor amounts of riparian vegetation (see Impact 4.7-a, above).

Replacement of the discharge pipes would consist of raising the pumping plants’ discharge pipes, extending the pipes to tie into existing discharge pipes within the waterside bench, and replacing or modifying pumps and motors. Seepage remediation in these locations may be required, including relocating the landside stations away from the levee to accommodate the raised discharge pipes. Modifications to the landside intake channel of RD 1000 Pumping Plant Nos. 6 and 8 may also be required. The waterside levee slope of RD 1000 Pumping Plant No. 8 would require partial regrading to accommodate the raised pump discharge pipes.

Lower Dry Creek, located east of the NEMDC, has been identified as a planting area to compensate for the Phase 4b Project’s removal of landside trees. Seasonal wetlands, vernal pools, freshwater marsh, and intermittent drainages are present within the planting area. Woodland mitigation plantings would not result in fill to waters of the United States; however, temporary impacts may occur from hauling woodland plantings and associated materials to planting sites.

A detailed design of aquatic habitat for the realigned and enhanced portion of the West Drainage Canal would be developed, and protective mechanisms and specific management protocols are currently being prepared by SAFCA, in consultation with USACE, USFWS, and DFG. To provide adequate compensation, these aquatic habitats would need be created and managed in a manner that would provide the essential functions of the habitats that would be lost. Therefore, an overall adverse impact on waters of the United States could occur if habitat
creation and management are not properly implemented. This impact is considered potentially significant.

(Similar)

Mitigation Measure 4.7-c: Minimize Effects on Jurisdictional Waters of the United States; Complete Detailed Design of Habitat Creation Components and Secure Management Agreements to Ensure Compensation of Waters Filled or Dewatered; and Comply with Section 404, Section 401, Section 10, and Section 1602 Permit Processes

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce impacts related to loss or fill of waters of the United States, including wetlands:

- Waters of the United States, including wetlands, shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist(s), that construction is implemented in a manner that minimizes disturbance of canals, ditches, and seasonal wetlands. Temporary fencing shall be used during construction to prevent disturbance of waters of the United States that are located adjacent to construction areas, but can be avoided.

- To mitigate for permanent impacts to sensitive aquatic resources, at least 1 acre of aquatic habitat (irrigation/drainage canal) or 1 acre of seasonal wetland/vernal pool shall be created for every acre that is lost to ensure no-net-loss of sensitive aquatic habitat. The mitigation ratio that is ultimately required will be determined by USACE through the Section 404 permitting process or USACE internal equivalent process. Features planned in the Phase 4b Project (under both action alternatives), would provide aquatic habitat that has been designed to offset the effects described above. These features include the creation of aquatic habitat resulting from construction of the relocated West Drainage Canal; creation of managed marsh at the Brookfield borrow site; and creation of managed marsh at Fisherman’s Lake, which was included as part of the Phase 4a Project and analyzed in the Phase 4a EIS and EIR. Most acreage associated with the relocated West Drainage Canal, the managed marsh habitat at the Brookfield borrow site, and at Fisherman’s Lake would meet the criteria for waters of the United States, including wetlands.

- Develop and implement a Mitigation and Monitoring Plan and Long-Term Management Plan in coordination with and subject to approval of USACE (only if SAFCA implements the Phase 4b Project), USFWS, and DFG. The MMP and LTMP shall provide complete detailed designs of habitat creation components, performance criteria, and management protocols. The project proponent(s) shall also enter into agreements with entities responsible for long-term management of created canals and marsh habitats to ensure that performance criteria and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be met and specifically detailed and outlined in the LTMP and MMP. All performance criteria and long-term management goals will be in full compliance with ESA and CESA.

The project proponent(s) shall secure all such agreements and implement all conditions of the agreements as follows: obtain the following applicable permits before the start of construction activities that would affect the resources covered by these permits: an individual permit pursuant to Section 404 of the CWA and Section 10 of the Rivers and Harbors Act from USACE (if the Phase 4b Project is implemented by SAFCA), Section 401 certification from the Central Valley RWQCB, and a Section 1602 Streambed Alteration Agreement from DFG (which applies to either USACE or SAFCA). All requirements of these permitting processes shall be implemented by the project proponent(s), as identified above.
Responsibility: Project proponent(s)
Timing: Before construction

Overall, the action alternatives would include creating waters of the United States that are expected to be more extensive than those filled by the Phase 4b Project, and implementing this mitigation measure, including coordination with and issuance of the permits by the aforementioned resource/regulatory agencies, would ensure no-net-loss of sensitive aquatic habitats occurs and that new jurisdictional waters would be managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost. Therefore, both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, with implementation of this mitigation measure, would have a less-than-significant (beneficial) impact on the overall acreage and function of waters of the United States in the Natomas Basin. (Similar)

Impact 4.7-d: Potential Loss of or Disturbance to Special-Status Plant Species and Their Habitats

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project improvements would occur; therefore, there would be no impact on special-status plant species and their habitats. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natoma perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could adversely or beneficially affect special-status plants and their habitats, depending on timing, location, and duration of flooding. For example, flooding could destroy existing marsh habitats but at the same time create new riparian habitats. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether beneficial or adverse is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Of the six special-status plant species that were determined to have the potential to occur in the Phase 4b Project area (rose mallow, Delta tule pea, Sanford’s arrowhead, dwarf downingia, Bogg’s Lake hedge-hyssop, and legenere), all would occur in aquatic habitats (see Section 3.7.2.2, “Special-Status Plant Species,” for further discussion). Focused surveys were conducted by AECOM botanists in July 2009 within the Phase 4a and 4b Project areas for rose mallow, Delta tule pea, and Sanford’s arrowhead. No special-status plants were found in the areas surveyed; however, the survey was conducted outside of the blooming period for dwarf downingia, Bogg’s Lake hedge-hyssop, and legenere. Habitat quality for these three species is considered low within the Phase 4b Project area. The Triangle Properties Borrow Area (Plate 2-13) has not been surveyed for special-status plants. Because no surveys have been conducted within the Triangle Properties Borrow Area, the potential for special-status plant species occurrence cannot be entirely dismissed. Therefore, this impact is considered potentially significant. (Similar)
Mitigation Measure 4.7-d: Minimize Impacts on Special-Status Plant Species

The project proponent(s) shall implement the following measures to reduce impacts to special-status plant species:

- Areas that have the potential to support special-status plant species shall be surveyed by a qualified botanist. To identify special-status species in accordance with DFG and CNPS protocol, the focused rare plant survey shall be conducted during the appropriate time of year when the target species would be clearly identifiable. If no evidence of special-status plants is found in the survey area, no further mitigation is necessary.

- If special-status plants are found, information on the special-status plant populations shall be recorded in the field on CNDDB data forms. These forms shall be submitted to the CNDDB upon completion of the survey. If the populations can be avoided, they shall be clearly marked in the field by a qualified botanist for avoidance during construction activities. If special-status plant populations cannot be avoided, consultations with USFWS and/or DFG may be required depending on the listing status of the species present. These consultations shall determine appropriate mitigation measures for any special-status species populations that would be affected by the implementation of the project. Appropriate measures may include the creation of off-site populations through seed collection or transplanting, preservation and enhancement of existing populations, or restoration or creation of suitable habitat in sufficient quantities to compensate for the impact. Performance criteria would include replacement ratios and rate of survival for replacement populations designed to achieve no net loss of the special-status plant population. The project proponent(s) shall implement all mitigation measures determined necessary during this consultation.

Responsibility: Project proponent(s)
Timing: Before construction

Implementation of Mitigation Measure 4.7-d would reduce the impact of the Phase 4b Project on potential special-status plant species that may be encountered in the Triangle Properties Borrow Area to a less-than-significant level because focused rare plant surveys would be conducted to determine presence/absence and appropriate measures to avoid or reduce impacts to such species would be implemented. (Similar)

Impact 4.7-e: Giant Garter Snake Mortality, Injury, and/or Disturbance to Habitat

Table 4.7-5 summarizes the Phase 4b Project’s permanent impacts on giant garter snake habitat.

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project improvements would occur. Because no habitat would be affected, there would be no impact on giant garter snake. (Lesser)
### Table 4.7-5
Permanent Impacts of the Phase 4b Project on Giant Garter Snake Habitat

<table>
<thead>
<tr>
<th>Location</th>
<th>No-Action Alternative</th>
<th>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal/ditch (Sacramento River east levee, NEMDC west levee, PGCC west levee, Vestal Drain, Morrison Canal, West Drainage Canal, and NCC)</td>
<td>Unknown, but losses of The Natomas Basin Conservancy preserve habitat and other agricultural habitats in the event of flooding could be substantial</td>
<td>23</td>
</tr>
<tr>
<td>Rice (PGCC west levee, NEMDC west levee, West Drainage Canal, Vestal Drain, Morrison Canal, Riego Road Canal, Chappell Ditch, private irrigation relocation, and creation of detention basins within the Triangle Properties Borrow Area)</td>
<td>Unknown, but losses of rice in the event of flooding could be substantial</td>
<td>259¹</td>
</tr>
<tr>
<td><strong>Total Permanent Impacts</strong></td>
<td>Unknown, but potentially substantial</td>
<td><strong>Canal/Ditch: 23</strong> Rice: 259</td>
</tr>
<tr>
<td><strong>Habitat Creation (Phase 4b Project)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Drainage Canal improvements and realignment²</td>
<td>-</td>
<td>Up to 13</td>
</tr>
<tr>
<td>Creation of managed marsh at Brookfield borrow site³</td>
<td>-</td>
<td>Up to 200</td>
</tr>
<tr>
<td><strong>Total Habitat Creation</strong></td>
<td>-</td>
<td>Up to 213</td>
</tr>
<tr>
<td><strong>Net Habitat Gain</strong></td>
<td>Unknown</td>
<td><strong>GGS/Drainage Canal: 13 Managed Marsh: up to 200</strong></td>
</tr>
</tbody>
</table>

Notes: EIR = environmental impact report; EIS = environmental impact statement; GGS = giant garter snake; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal

¹ Assumes worst-case scenario that excavated detention basins cannot be returned to rice. If detention basins can be returned to rice, impacts would be substantially reduced (by approximately 147 acres).
² Created canal habitat is considered to provide higher quality habitat than rice or canals for giant garter snake.
³ Excavation of the Brookfield borrow site was analyzed in the Phase 2 EIS and EIR and Phase 3 EIS and EIR. As part of the Phase 4b Project, up to 200 acres of this property may be converted from rice to managed marsh habitat to compensate for the Phase 4b Project’s impacts to 112 acres of rice. Creation of managed marsh is considered to provide higher quality habitat than rice for giant garter snake.

Source: Construction data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009; data compiled by AECOM in 2010

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**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure could result in an adverse impact on the Natomas Basin giant garter snake population. Giant garter snakes require upland refugia and may not be able to escape flood waters during their inactive season (October–April), depending on the velocity and depth of the floodwaters and the speed with which the floodwaters inundate the Basin. A catastrophic flood of the Natomas Basin could result in direct mortality of a substantial portion of the Basin’s giant garter snake population, as well as extensive damage to habitat for the species, including TNBC preserves and the infrastructure that supports operation of the preserves. The magnitude of the impacts would depend upon the flooding duration, depth, rate, timing, and location; therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration. (Currently Unknown)**
Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction-Related Impacts to Giant Garter Snake

Project construction and implementation would result in permanent and temporary loss and disturbance of potential giant garter snake habitat. Temporary loss of habitat is defined as habitat being unavailable or unusable for one giant garter snake active season. Fill, temporary and permanent dewatering, land conversion, and staging and other construction disturbances could disturb, injure, or kill snakes using affected habitats, including irrigation ditches, drainage canals, rice fields, and associated uplands. Project construction activities in areas of potentially suitable habitat, as well as geotechnical and cultural resource investigations conducted near suitable habitat, could also result in direct disturbance and loss of individual giant garter snakes. Construction-related adverse impacts on giant garter snake habitat within the Phase 4b Project footprint would occur along Sacramento River east levee Reach A:16–18B as a result of the realignment of a portion of the West Drainage Canal and bank improvements to the rest of the canal; along the NCC, PGCC, and NEMDC as a result of relocation of Riego Road Canal, Vestal Drain, and Morrison Canal; and within the South Fisherman’s Lake and Triangle Properties Borrow Areas.

Permanent loss of aquatic giant garter snake habitat in the Phase 4b Project area would include the loss of lateral canals that would be abandoned as a result of the realignment of a portion of the West Drainage Canal (Plate 2-17), as well as a small area of cultivated rice within the relocated West Drainage Canal alignment. The relocation of the Vestal Drain and the Riego Road Canal would result in permanent impacts to cultivated rice along the south levee of the NCC and the west levee of NEMDC North, respectively. Levee widening would result in a permanent loss of cultivated rice habitat along the west levees of the PGCC and NEMDC North. Permanent loss of aquatic giant garter snake habitat would also occur in the Triangle Properties Borrow Area from creation of detention basins in cultivated rice (Plate 2-13). Six erosion sites have been identified on the waterside of the PGCC and NEMDC for levee slope erosion repair, placement of rip rap, and/or channel realignment (Plates 2-13 and 2-14). The low-flow channel of the NEMDC south of City Sump Pump 157 requires realignment, and a rock berm would be installed between the City sump pump and the realigned low-flow channel. Installation of a beaver wall along the PGCC, and erosion site repair along the PGCC and NEMDC South, would result in permanent impacts to giant garter snake habitat below the OHWM of the PCGG and NEMDC (see Table 4.7-5 for acreage).

Temporary loss/disturbance of giant garter snake habitat would result from relocating and extending the West Drainage Canal. This impact would be temporary because the new (realigned) West Drainage Canal would be constructed and would be functional at least one giant garter snake season before impacts occur to the existing West Drainage Canal. The realigned West Drainage Canal is expected to provide a higher habitat value relative to that of the canal that would be filled, and the realigned West Drainage Canal would be designed to minimize maintenance requirements, thus reducing the likelihood of snake injury and mortality associated with canal maintenance. A small amount of aquatic habitat could also be temporarily disturbed in areas where the replacement of irrigation/drainage canals connect to existing lateral canals and in areas where pumping plants are relocated or modified. This impact would be potentially significant.

A portion of the Triangle Properties Borrow Area supports rice fields that provide giant garter snake habitat. Because these rice fields would be returned to rice production, the impacts of borrow activities on these rice fields are considered temporary as the habitat would be unsuitable as giant garter snake habitat for one active season and restored to a similar or higher-quality habitat upon the completion of borrow activities. Managed marsh is considered higher quality habitat than rice fields because rice provides suitable habitat only for one-third of the year (when it is flooded) and does not generally provide suitable habitat year-round (e.g., winter upland refugia are absent). Mitigation would be required to ensure that impacts to giant garter snake from overlapping uses of borrow areas are temporary and do not affect current habitat in borrow areas for more than one construction season. A portion of the Triangle Properties Borrow Area used for borrow would be restored to rice fields that also serve as detention basins for winter stormwater. If these rice field/detention basins cannot be restored to
workable rice fields during reclamation, the result would be the permanent loss of giant garter snake habitat (see Table 4.7-5 for acreage). This impact would be potentially significant.

Up to 200 acres of the Brookfield borrow site may be converted from rice to managed marsh habitat as part of the Phase 4b Project, resulting in a beneficial impact to giant garter snake. Excavation of the Brookfield borrow site was previously analyzed in the Phase 2 EIS and EIR and Phase 3 EIS and EIR. The conversion of 200 acres of rice habitat to managed marsh habitat would be a beneficial impact to giant garter snake.

Beneficial impacts to giant garter snake would also result from implementation of the NLIP and its associated programmatic conservation strategy (see Section 4.7.1.1, “Methodology”). The NLIP conservation strategy is expected to result in an overall net gain in garter snake habitat in the Basin (Table 4.7-1) and an overall improvement in habitat conditions for giant garter snake. Benefits to giant garter snake in the NLIP programmatic conservation strategy that were included in earlier project phases are the creation of giant garter snake habitat resulting from construction of the new West Drainage Canal, the relocation of Elkhorn Canal (Phase 3 Project), and the relocation of Riverside Canal (Phase 4a Project). These canals have been designed to minimize the intensity and frequency of maintenance activities, thus reducing habitat degradation and snake injury and mortality. The habitat quality of the new West Drainage Canal is anticipated to eventually be substantially higher than that of the canal habitat that would be lost. In addition to providing habitat, this canal would provide connectivity between known giant garter snake population centers within the Natomas Basin. Loss and deterioration in the quality of existing travel corridors has been identified as a primary concern in maintaining a genetic connection among the snake populations in the Natomas Basin.

Managed marsh would be created in the Fisherman’s Lake Borrow Area as part of the Phase 4a Project to compensate for Phase 4a and 4b Project impacts to giant garter snake habitat, as well as for impacts to giant garter snake habitat from the Phase 2 and 3 Projects. This proposed managed marsh creation, as described in the Phase 4a EIS and EIR, and as summarized in Section 4.7.1.1 above, would also aid in the overall goal of sustaining giant garter snake populations in the Natomas Basin. Creating marsh habitat would not only increase the amount of giant garter snake habitat over what currently exists, but would also help to consolidate and provide connectivity between marsh habitat on TNBC preserve lands managed for giant garter snake in the Fisherman’s Lake Area. The approach of converting Fisherman’s Lake Borrow Area to managed marsh habitat would be consistent with the NBHCP’s goal of sustaining giant garter snake populations in the southern reserve area. Giant garter snakes have been recorded on TNBC lands that were converted from rice to managed marsh, thus demonstrating that giant garter snake would use restored managed marsh habitats. Overall, impacts to giant garter snake related to Phase 4b Project construction activities would be potentially significant. (Similar)

Operational Impacts to Giant Garter Snake

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, RD 1000’s Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 would require pump upgrades to pump the water from the interior of the Basin out. Intakes would be operated seasonally to pump out agricultural drainage and stormwater from the interior of the basin to the Sacramento River, NEMDC, and PGCC. The interior drainage canals are considered giant garter snake habitat.

Giant garter snakes swimming near intake structures could potentially be trapped by the intake velocities. However, because modifications to the pumps and intakes would not produce a change in the rate and volume of water pumped, an increase in entrapment of aquatic fauna above the existing condition is not expected. In addition, giant garter snakes, which typically swim near the water surface, are likely to avoid entrapment through their strong swimming skills and behavioral avoidance of areas that are routinely disturbed (Hansen pers. comm. 2008; Hansen and Brode 1993). Therefore, because giant garter snakes are likely to avoid the area, operational activities at modified pump stations are not likely to cause disturbance or injury to the snake. Impacts to giant garter snake related to operation of relocated or modified pump stations following project construction are considered less than significant. (Similar)
Mitigation Measure 4.7-e: Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Implement All Upland and Aquatic Habitat Improvements and Management Agreements to Ensure Adequate Compensation for Loss of Habitat, and Obtain Incidental Take Authorization

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

To reduce impacts on the giant garter snake, the project proponent(s) shall implement the following measures:

► The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of giant garter snake habitat (e.g., temporary fencing shall be used during construction to protect all aquatic and adjacent upland habitat that is located adjacent to construction areas that can be avoided).

► Additional measures consistent with the goals and objectives of the NBHCP shall be implemented to minimize the potential for direct injury or mortality of individual giant garter snakes during project construction. Such measures shall be finalized in consultation with USFWS and DFG, and are likely to include conducting worker awareness training, timing initial ground disturbance to correspond with the snake’s active season (as feasible in combination with project needs and minimizing disturbance of nesting Swainson’s hawks), dewatering aquatic habitat before fill, conducting pre-construction surveys, erecting fencing around habitat features that can be avoided to ensure that these remain undisturbed by construction vehicles and personnel, conducting biological monitoring during construction, and removing any temporary fill or construction debris and restoring temporarily disturbed areas to their pre-project conditions according to the USFWS’s Guidelines for the Restoration and/or Replacement of Giant Garter Snake Habitat (USFWS 1997).

► The project proponent(s) shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that the NLIP’s aquatic and upland habitat improvements are created and managed. The project proponent(s) shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components before construction commences. The project proponent(s) shall enter into agreements with the appropriate local entity responsible for long-term management of these created giant garter snake habitats and shall coordinate with USFWS and DFG to ensure that performance criteria and long-term management goals required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance criteria and long-term management goals will be in full compliance with ESA and CESA. The project proponent(s) shall implement all terms and conditions of the management agreements.

► Where borrow sites would result in impacts to giant garter snake habitat over more than one construction season, the work shall progress in cells that will be incrementally developed as habitat or returned to agricultural use as the borrow activities are completed such that no area would be used in consecutive years or such that replacement habitat is available before the loss of existing habitat.

► Authorization for take of giant garter snake under the ESA and CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented.

Responsibility: Project proponent(s)

Timing: Prepare and adopt the MMP and LTMP before construction; implement measures to minimize disturbance to giant garter snake and its habitat before and during construction
Implementing this mitigation measure would reduce construction- and operational-related impacts related to giant garter snake to a **less-than-significant** level because construction would be implemented in a manner that reduces loss of habitat and direct mortality, measures that are part of the NBHCP related to giant garter snake would be implemented, the NLIP’s habitat improvements would be implemented in consultation with USFWS and DFG, and take permits would be obtained. *(Similar)*

**Impact 4.7-f: Impacts on Swainson’s Hawk and Other Special-Status Birds**

**Tables 4.7-6 and 4.7-7** summarize impacts to Swainson’s hawk foraging and nesting habitat that would occur with project implementation.

### Table 4.7-6
**Permanent Impacts of the Phase 4b Project on Swainson’s Hawk Habitat**

<table>
<thead>
<tr>
<th>Location of Impact</th>
<th>No-Action Alternative (acres)</th>
<th>Adjacent Levee Alternative (Proposed Action) (acres)</th>
<th>Fix-in-Place Alternative (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasslands¹ (Sacramento River east levee, PGCC west levee, NEMDC west levee, Morrison Canal, West Drainage Canal Relocation, Chappell Ditch, Pumping Plant Modifications, and NCC/SR 99 Bridge Remediation)</td>
<td>Unknown, but losses of TNBC preserve habitats and other agricultural habitats in the event of flooding could be substantial</td>
<td>171</td>
<td>170</td>
</tr>
<tr>
<td>Croplands² (Sacramento River east levee, NEMDC west levee, Morrison Canal, Vestal Canal, and West Drainage Canal Relocation)</td>
<td>Unknown, but losses of TNBC preserve habitats and other agricultural habitats in the event of flooding could be substantial</td>
<td>82</td>
<td>81</td>
</tr>
<tr>
<td>Woodlands (Sacramento River east levee, American River north levee, NEMDC west levee, West Drainage Canal Relocation, and Pumping Plant Modifications)</td>
<td>0.51 landside 110.26 waterside</td>
<td>35.99 landside 55.22 waterside</td>
<td>34.79 landside 110.73 waterside</td>
</tr>
</tbody>
</table>

**Total foraging impacts¹²** Unknown, but potentially substantial 253 251

**Total nesting impacts¹²** 110.77 91.21 145.52

Notes: NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; TNBC = The Natomas Basin Conservancy

¹ Up to 60 acres of grassland habitat (not included in this calculation) could be affected at the Lower Dry Creek Woodland Mitigation Planting Area.

² Up to 10 acres of cropland (not included in this calculation) may be affected by the woodland planting along Reach A:16 of the Sacramento River.

Source: Construction data provided by Wood Rodgers in 2009 and Mead & Hunt in 2009; data compiled by AECOM in 2010

### Table 4.7-7
**Permanent Phase 4b Project Impacts on Swainson’s Hawk Foraging Habitat**

<table>
<thead>
<tr>
<th>Affected Cropland (acres)</th>
<th>Created Cropland (acres)</th>
<th>Net Cropland (acres)</th>
<th>Affected Grassland (acres)</th>
<th>Created¹ Grassland (acres)</th>
<th>Net Grassland (acres)</th>
<th>Total Loss (acres)</th>
<th>Total Increase (acres)</th>
<th>Total Net (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 4b Project</td>
<td>-82</td>
<td>-82</td>
<td>-171</td>
<td>161</td>
<td>-10</td>
<td>253</td>
<td>Up to 578</td>
<td>Up to 144.45</td>
</tr>
<tr>
<td>NLIP</td>
<td>-829</td>
<td>150</td>
<td>-679</td>
<td>-463</td>
<td>1,230</td>
<td>767</td>
<td>1,292</td>
<td>1,380</td>
</tr>
</tbody>
</table>

Notes: NLIP = Natomas Levee Improvement Program; NEMDC = Natomas East Main Drainage Canal

¹ Includes NEMDC west levee slopes and seepage berms along the Sacramento River east levee Reach A:16–18B; Reach A:19A–20 not included in estimate of impacts to Swainson’s hawk foraging habitat because this area is urbanized and provides lower-quality habitat.

Source: Data compiled by AECOM in 2010
No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, there would be no adverse or beneficial impacts on suitable habitat for Swainson’s hawk and other special-status birds (listed in Table 3.7-4). Even under the No-Action Alternative, however, extensive removal of riparian vegetation on the waterside of the Sacramento River east levee and NEMDC west levee could occur to conform with USACE guidance regarding levee encroachments (see Table 4.7-2). The habitat along the waterside of the Sacramento River east levee supports the majority of Swainson’s hawk nest sites in the Natomas Basin. Removal of this vegetation would have a substantial impact on Swainson’s hawks; therefore, this impact would be potentially significant. (Greater)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding could cause destruction of Swainson’s hawk or other special-status bird habitat. The magnitude of the impacts would depend upon the flooding duration, depth, rate, timing, and location. Therefore, a definite determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

Potential adverse effects on the Swainson’s hawk would include loss of suitable foraging and nesting habitat and disturbance of nesting pairs during project construction. Other special-status birds, including white-tailed kite, northern harrier, and Cooper’s hawk, could also be similarly affected (all special-status birds that may be affected are listed in Table 3.7-4). The effects on foraging and nesting habitat would result from construction of levee improvements along Sacramento River east levee Reach A:16–20, American River north levee Reach 1:1–4, and the west levees of the PGCC and NEMDC; construction of the relocated West Drainage Canal; borrow activities; and the creation of woodland corridors.

Impacts to Foraging Habitat

As summarized in Table 4.7-6, foraging habitat affected by the Adjacent Levee Alternative (Proposed Action) would be primarily croplands and grasslands. The permanent loss of Swainson’s hawk foraging habitat within the Phase 4b Project area would be offset by the creation of grasslands foraging habitat. The creation of grasslands would take place primarily on levee slopes of the adjacent levee and seepage berms along Sacramento River east levee Reach A:16–19A and along the widened NEMDC west levee. The Adjacent Levee Alternative (Proposed Action) would result in levee slopes that would be less steep than the existing levee slopes, and along the Sacramento River east levee, several reaches of the levee would have adjoining 100- to 300-foot-wide earthen seepage berms with a nearly flat slope. These areas, with the exception of the crown of the levee and woodland corridors, would be managed as native perennial grassland that would be mowed or grazed with an emphasis on maintaining stubble height to optimize these areas for Swainson’s hawk foraging habitat.

As shown in Table 4.7-7, the Phase 4b Project would result in a net decrease in foraging habitat for Swainson’s hawk, but the overall NLIP results in a net increase in foraging habitat for Swainson’s hawk. However, due to conversion of land cover types in the Phase 4b Project footprint, the composition of this foraging habitat would permanently shift from primarily croplands to grasslands, leading to a potential decrease in the quality of foraging habitat for Swainson’s hawk. Some foraging habitat would be temporarily affected by the Phase 4b Project borrow activities at the South Fisherman’s Lake and Triangle Properties Borrow Areas, and the West Lakeside School Site; however, much of this area would be returned to equivalent foraging habitat following borrow
activities. Grassland would be permanently converted where woodland plantings would occur as compensation for landside woodland impacts, including in Sacramento River east levee Reach A:16 (Plate 2-7a) and in the Lower Dry Creek area east of the NEMDC (Plate 2-14).

The greatest impact to overall foraging habitat value would be the permanent loss of alfalfa and grass hay, which are considered the highest value foraging habitat types for Swainson’s hawks in the Central Valley. The loss of alfalfa, grass hay, and other foraging habitats could result in Swainson’s hawks having to forage farther from the nest or increased competition for prey with other hawks in the area. Several studies have documented the importance of hay crops, especially alfalfa for Swainson’s hawks (Estep 1989, Estep 2008, and Woodbridge 1998). The characteristics that contribute to high-value habitat include:

- low vegetation structure, which increases prey accessibility;
- relatively large prey populations due to abundant cover and food;
- farming operations, such as weekly irrigation, which increases cover and food for prey; and
- regular mowing, which lowers vegetation structure, disturbs prey, and increases accessibility.

A detailed design of the foraging habitats to be created is being developed by SAFCA, in consultation with USACE, and will be provided for USFWS and DFG review as part of the Phase 4a Project, in advance of Phase 4b Project approval. Protective mechanisms and specific management protocols for Swainson’s hawk foraging habitat that would be created in the Fisherman’s Lake Borrow Area are currently being prepared by SAFCA, in consultation with USACE, in coordination with these agencies. If habitat creation/preservation and management are not effectively implemented to provide foraging habitat for the Swainson’s hawk or other special-status bird species listed in Table 3.7-4, an overall adverse effect could occur. This impact would be potentially significant.

Impacts to Nesting Habitat

An estimated 600 acres of riparian and non-riparian woodland habitat are present on the landside of the Natomas Basin, and approximately 420 acres of riparian woodland habitat are present along the waterside of the Sacramento River east levee and American River north levee, totaling approximately 1,020 acres. The vast majority of Swainson’s hawk nests in the Basin is within the mature riparian forest/woodlands along the waterside of the Sacramento River east levee. The design of the adjacent levee along the Sacramento River east levee avoids almost entirely the need to remove waterside riparian forest/woodlands, which would otherwise be removed if the levee were being rebuilt and upgraded in place or no action was taken. The woodlands that would be affected are along the landside of the Sacramento River east levee in areas where few nests have been documented since 2001, along the landside and waterside of the American River north levee, and along the waterside of the NEMDC South. Most nests that have been documented on the landside of the Sacramento River east levee are within woodlands in substantial riparian corridors along ditches, sloughs, and canals towards the interior of the Basin.

The Adjacent Levee Alternative (Proposed Action) would affect a moderate amount of primarily landside woodlands; this acreage includes an understory of scrub and grassland components (Table 4.7-2). Project impacts include removing landside woodland habitat along Sacramento River east levee Reach A:16–20 and American River north levee Reach 1:1–4, landside woodland habitat where the replacement West Drainage Canal is to be constructed, and landside and waterside woodland associated with levee widening and compliance with vegetation guidance criteria along the NEMDC west levee (see Table 4.7-2 for acreages). Woodlands are not present along the PGCC west levee improvements within the Phase 4b Project area.

Compensation for adverse impacts on nesting habitat and potential unavoidable loss of active nests resulting from the Adjacent Levee Alternative (Proposed Action) would include creating and preserving woodlands along the landside of the Sacramento River east levee in Reach A:16 and immediately east of the NEMDC along Lower Dry Creek so that no net loss of landside woodlands would occur over the long-term (see Table 4.7-3). As shown in Table 4.7-3, the NLIP’s programmatic conservation strategy for creation and preservation of landside woodlands would result in an overall net increase in woodland acreage in the Natomas Basin.
The woodland mitigation plan includes transplanting suitable trees from the project footprint, where feasible, as well as planting a variety of native tree species that could become potential nesting habitat for Swainson’s hawk or other special status birds listed in Table 3.7-4. To provide adequate compensation for lost habitat, the woodlands must be created and/or managed in a manner that provides the essential habitat functions for special-status bird species. A detailed design of the woodland habitats to be created is being developed and provided for USFWS and DFG review; protective mechanisms and specific management protocols for the woodlands are currently being prepared by SAFCA, in consultation with USACE, in coordination with these agencies (as described in Section 2.3.4, “Habitat Improvements”).

However, if habitat creation/preservation is not effectively implemented to provide nesting habitat for Swainson’s hawk or other special-status bird species (listed in Table 3.7-4), an overall adverse effect could occur. Should habitat creation/preservation be implemented effectively, there would be a temporal (minimum 10–15 years) loss of woodlands, with the exception of Heritage oaks, providing potential nesting habitat for Swainson’s hawk and other special-status birds. These impacts would be potentially significant.

Impacts to Nesting Behavior

Project construction would occur during the Swainson’s hawk nesting season and could disrupt nesting behavior. If project construction is already under way when pairs return to their nesting territories, project activity could render previously occupied territories unsuitable. If active nests are present near construction areas when construction begins, the nesting pairs could be disturbed, potentially resulting in nest abandonment and loss of eggs or young. Various conservation measures would be implemented to avoid and minimize take of Swainson’s hawks. These measures include conducting surveys for and monitoring of Swainson’s hawk nests and the nests of other special status birds identified in Table 3.7-4 before and during construction to identify active nests in the vicinity of project activities, and establishing and maintaining buffers around the nests, in coordination with DFG, so that project construction activities do not result in detectable adverse effects on active nests. This impact would be potentially significant.

Impacts Related to Power Pole Relocations

The Phase 4b Project includes relocating or replacing Pacific Gas & Electric Company (PG&E) and Sacramento Municipal Utility District (SMUD) power poles. Power poles may benefit raptors by providing perching and/or nesting structures (or both) in areas where few natural perches or nest sites exist. However, these structures can also pose a threat to raptors and other birds through electrocutions or collisions. Mortality is most common with birds with large wing spans, such as eagles or cranes. Electrocution can occur when a bird simultaneously touches two energized parts or an energized part and a grounded part of the electrical equipment. PG&E has developed and implemented an Avian Protection Plan (APP) to better protect birds and improve safety and reliability for its customers. The APP, which has been in place since 2002, includes outfitting all new poles and replacement poles in bird-sensitive locations with bird-safe equipment. PG&E is also a founding member of the Avian Power Line Interaction Committee (APLIC), a collaboration between utilities and USFWS that began nearly 20 years ago. The APLIC has guidelines and industry standards to avoid bird collisions and electrocutions.

The Adjacent Levee Alternative (Proposed Action) would not increase power pole-related hazards for the Swainson’s hawk and other birds. While the project proponent(s) has no direct control over the specific design and retrofitting of the relocated and replaced power poles, it can be expected that PG&E will implement its APP and follow the APLIC guidelines and industry standards to reduce electrocution of birds perching on the power poles and power lines. The Adjacent Levee Alternative (Proposed Action) would have no impact on Swainson’s hawks and other birds as a result of power pole relocations.
Under the Fix-in-Place Alternative, potential effects on Swainson’s hawk and other special-status bird species identified in Table 3.7-4 associated with the Sacramento River east levee improvements would be somewhat different from those under the Adjacent Levee Alternative (Proposed Action). Compared to the Adjacent Levee Alternative (Proposed Action), loss of nesting habitat on the landside of the levee would be reduced under the Fix-in-Place Alternative (see Table 4.7-2 for acreage). However, a substantially greater number of acres of riparian woodland acres on the waterside of these levee reaches that provide suitable nesting habitat for Swainson’s hawk would likely need to be removed to conform with USACE guidance regarding levee encroachments (Table 4.7-2). Potential adverse impacts from such vegetation removal are likely to be greater than those under the Adjacent Levee Alternative (Proposed Action), in terms of both the amount and quality of that habitat. The foraging habitat affected by this alternative would be cropland replaced by grasslands along levee and berms resulting in a nearly equal amount of foraging habitat, but a conversion of higher-quality croplands to grasslands that provide lesser-quality habitat.

Similar to the Adjacent Levee Alternative (Proposed Action), the impacts on nesting habitat and potential unavoidable loss of active nests associated with the removal of landside woodlands would be compensated by the proposed creation of landside woodland habitat in Sacramento River east levee Reach A:16 and along Lower Dry Creek. However, it is uncertain whether the new woodlands would be adequate to compensate for the potential extensive loss of Swainson’s hawk nests sites on the waterside of the Sacramento River east levee Reach A:16–20 and NEMDC west levee. The Fix-in-Place Alternative would also require relocation and replacement of some power poles. As with the Adjacent Levee Alternative (Proposed Action), this alternative would not increase power pole-related hazards for the Swainson’s hawk and other birds because it can be expected that PG&E would implement its APP and follow the APLIC guidelines and industry standards to reduce electrocution of birds perching on the power poles and power lines.

Overall, as with the Adjacent Levee Alternative (Proposed Action), if habitat creation/preservation is not effectively implemented to provide foraging and nesting habitat for Swainson’s hawk or other special-status bird species, an overall adverse effect could occur. This impact would be potentially significant. (Greater)

Mitigation Measure 4.7-f: Minimize Potential Impacts on Swainson’s Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Implement All Upland and Agricultural Habitat Improvements and Management Agreements to Compensate for Loss of Quantity and Quality of Foraging Habitat, Obtain Incidental Take Authorization; and Implement Mitigation Measure 4.7-a, “Minimize Effects on Woodland Habitat, Implement all Woodland Habitat Improvements and Management Agreements, Compensate for Loss of Habitat, and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code”

The project proponent(s) and its primary contractors for engineering design and construction shall ensure that the following measures are implemented to avoid, minimize, and compensate for potential project effects on Swainson’s hawks and other special-status birds:

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of potential nesting habitat for special-status birds through the following activities:
  - The biologist shall conduct pre-construction surveys to identify active special-status bird nests near construction areas.
• Surveys for nesting birds shall be conducted before project activities are initiated during the nesting season (March 1–September 15). Surveys shall be conducted in accordance with standardized protocols and NBHCP requirements.

• Removal of potential nesting habitat shall be conducted during the non-nesting season, to the extent feasible and practicable, to minimize the potential for loss of active nests.

• If an active nest is found, the biologist shall determine an appropriate buffer that minimizes potential for disturbance of the nest, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted during construction and by a qualified biologist to ensure that project activity does not result in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

► The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that staging areas and access routes are designed to minimize disturbance of known Swainson’s hawk nesting territories through the following activities:

• The biologist shall conduct pre-construction surveys to identify active nests within 0.50 mile of construction areas, in accordance with DFG guidelines. Surveys shall be conducted in accordance with NBHCP requirements and Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley (Swainson’s Hawk Technical Advisory Committee 2000).

• If an active nest is found, an appropriate buffer that minimizes the potential for nest disturbance shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted during construction and by a qualified biologist to determine whether project activity results in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

► The project proponent(s) shall coordinate with USFWS and DFG to ensure that the NLIP’s woodland, upland, and agricultural habitat improvements are created and managed. SAFCA, in consultation with USACE, shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components before construction commences. SAFCA, in consultation with USACE, shall enter into agreements with the appropriate local entity responsible for long-term management of these created Swainson’s hawk habitats and shall coordinate with USFWS and DFG to ensure that performance criteria and long-term management goals that are required by the regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance criteria and...
long-term management goals will be in full compliance with ESA and CESA. SAFCA, in consultation with USACE, shall implement all terms and conditions of the management agreements.

► The criteria for measuring performance shall be used to determine if the habitat improvement is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in design or maintenance revisions). These criteria must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. Performance criteria for managed grasslands shall be developed by SAFCA in consultation with USACE, USFWS, NMFS, and DFG, and shall include, but not be limited to:

• percent cover of invasive species (<1%),
• percent cover of nonnative herbaceous plants (<10–25%), and
• percent absolute cover of native species (>50–80%).

► Authorization for take of Swainson’s hawk under CESA shall be obtained. All measures subsequently adopted through the permitting process shall be implemented.

In addition to the above measures, the project proponent(s) shall implement Mitigation Measure 4.7-a, above.

Responsibility: Project proponent(s)
Timing: Before construction

Implementation of this mitigation measure, as well as Mitigation Measure 4.7-a, would minimize adverse effects of the Adjacent Levee Alternative (Proposed Action) on Swainson’s hawk. This measure coupled with the amount of landside woodlands that would be created and preserved as part of the Phase 2, 3, and 4a Projects would result in a net increase in potential nesting habitat (landside woodlands). The creation and preservation of nesting and foraging habitat in the Basin would reduce long-term and overall impacts to Swainson’s hawk to a less-than-significant level. Although no permanent impacts would occur, this impact would remain significant and unavoidable for many years before reaching a less-than-significant level because replacement plantings, with the exception of replacement of Heritage oaks, would likely require a minimum of 10–15 years before providing important habitat components such as structure and shade. Replacement oak plantings would remain significant and unavoidable because it would take approximately 100 years to reach Heritage status.

Implementation of this mitigation measure, as well as Mitigation Measure 4.7-a, would minimize long-term, adverse effects of the Fix-in-Place Alternative on Swainson’s hawk, but would not fully reduce waterside vegetation loss to a less-than-significant level. While the woodland mitigation proposed for the Fix-in-Place Alternative would mitigate for landside nesting habitat impacts, the proposed mitigation would not be adequate to compensate for the extensive loss of mature waterside vegetation; therefore, this impact would remain significant and unavoidable. (Greater)
Impact 4.7-g: Potential Loss and/or Direct Impact of Elderberry Shrubs and/or Potential Loss of Valley Elderberry Longhorn Beetle

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for direct disturbance on valley elderberry longhorn beetle or elderberry shrubs due to project construction activities. However, there could be extensive removal of elderberry shrubs on the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments, even without project implementation. This potential impact would be potentially significant. (Greater)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding of the Basin might result in beneficial or adverse conditions for elderberry shrubs and, consequently, valley elderberry longhorn beetle, in some locations. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether adverse or beneficial, is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

Approximately seven elderberry shrubs are known to be present within or adjacent to the Phase 4b Project footprint along the landside of the Sacramento River east levee Reach A:16–20, and two shrubs are present within or adjacent to the proposed landside footprint of American River north levee Reach I:1–4. Because elderberry surveys have not been conducted on the waterside of Sacramento River east levee Reach A:16–20, the American River north levee, or the NEMDC west levee, the number of waterside elderberry shrubs is unknown. The loss and/or direct impact of elderberry shrubs and potential loss of beetles under the Adjacent Levee Alternative (Proposed Action) would be offset by SAFCA’s plan to incorporate plantings of elderberry shrubs and other appropriate native species into the woodland corridors and other potential woodland restoration areas. Elderberry shrubs would be planted in numbers adequate to compensate for elderberry shrub loss, based on standard USFWS mitigation guidelines. A detailed plan for woodland creation is being developed by SAFCA, in consultation with USACE, and will be provided to USFWS and DFG for review; and protective mechanisms and specific management protocols are currently being prepared by SAFCA in coordination with these agencies, including USACE. Portions of the woodland areas must be created and managed in a manner that provides the essential functions of valley elderberry longhorn beetle habitat that would be lost through project activities in order for them to provide adequate compensation. However, if habitat creation and management are not effectively implemented to provide replacement habitat for the valley elderberry longhorn beetle, an overall adverse effect could occur. This impact would be potentially significant.

Fix-in-Place Alternative

Under the Fix-in-Place Alternative, potential impacts on valley elderberry longhorn beetle would be somewhat different from those under the Adjacent Levee Alternative (Proposed Action). Loss of elderberry shrubs on the landside of the Sacramento River east levee may be reduced under this alternative by the lack of an adjacent levee, but a substantial amount of riparian woodland that supports an unknown number of elderberry shrubs on the waterside of the levee may require removal to conform with USACE guidance regarding levee encroachments (Table 4.7-2). Per the USFWS’s conservation guidelines for this species (USFWS 1999), all of these shrubs would be transplanted during the dormant season into woodland corridors. Potential adverse impacts from such
vegetation removal could be greater than those within the adjacent levee footprint on the landside of the levee under the Adjacent Levee Alternative (Proposed Action), particularly in terms of the quality of habitat that is affected. Similar to the Adjacent Levee Alternative (Proposed Action), the loss of elderberry shrubs and potential loss of beetles under the Fix-in-Place Alternative would be offset by SAFCA’s plan to incorporate plantings of elderberry shrubs and other appropriate native species into the woodland corridors and other potential woodland restoration areas. However, as with the Adjacent Levee Alternative (Proposed Action), overall adverse effects could occur if the replacement habitat does not provide the essential components and is not managed in a way that maximizes habitat quality and minimizes potential adverse effects on valley elderberry longhorn beetle. This impact would be potentially significant. (Greater)

**Mitigation Measure 4.7-g: Conduct Focused Surveys for Elderberry Shrubs as Needed, Implement All Woodland Habitat Improvements and All Management Agreements, Ensure Adequate Compensation for Loss of Shrubs, and Obtain Incidental Take Authorization**

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

To reduce impacts on valley elderberry longhorn beetle, the project proponent(s) shall implement the following measures:

- A qualified biologist retained by the project proponent(s) shall conduct focused surveys of elderberry shrubs within 100 feet of the project footprint, in accordance with USFWS guidelines. All elderberry shrubs with potential to be affected by project activities shall be mapped, the number of stems greater than 1 inch in diameter on each shrub that requires removal shall be counted, and these stems shall be searched for beetle exit holes.

- The primary engineering and construction contractors shall ensure, through coordination with the biologist, that construction is implemented in a manner that minimizes disturbance of areas that support elderberry shrubs (e.g., temporary fencing shall be used during construction to protect all elderberry shrubs that are located adjacent to construction areas but can be avoided). Shrub that require removal shall be transplanted to the woodland creation areas, if feasible, when the plants are dormant (November through the first 2 weeks of February) to increase the success of transplanting. If none of the areas of suitable habitat to be created as part of the project would be available before the impact would occur, alternative transplantation locations (e.g., other SAFCA mitigation areas or TNBC preserves) shall be identified and shall be approved by USFWS.

- The number of replacement elderberry plantings shall be determined based on USFWS guidelines, which require replacement ratios ranging from 1:1 to 8:1 for lost stems at least 1 inch in diameter, depending on the size of the affected stems and presence or absence of beetle exit holes. Associated native species shall be planted at ratios ranging from 1:1 to 2:1 for each elderberry planting.

- The project proponent(s) shall coordinate with USFWS, DFG, and SCAS (if on Airport property) to ensure that the NLIP’s woodland habitat improvements are created and managed. The project proponent(s) shall prepare a project-specific MMP and programmatic LTMP to ensure the creation and long-term management of these components before construction commences. The project proponent(s) shall enter into agreements with the appropriate local entity responsible for long-term management of these created woodland habitats and shall coordinate with USFWS and DFG to ensure that performance criteria and long-term management goals that are required by regulatory agencies with jurisdiction over these resources will be specifically detailed and outlined in the LTMP and MMP. All performance criteria and long-term management goals will be in full compliance with the ESA and CESA. The project proponent(s) shall implement all terms and conditions of the management agreements.
USACE shall initiate consultation activities with USFWS under Section 7 of the ESA, and authorization for take of valley elderberry longhorn beetle under the ESA shall be obtained if it is determined, in consultation with USFWS, that shrub removal is likely to result in such take. All measures subsequently developed through the Section 7 consultation process shall be implemented by the project proponent(s).

Responsibility: Project proponent(s)
Timing: Before construction

Implementing this mitigation measure would reduce the impact on valley elderberry longhorn beetle to a less-than-significant level because protocol-level surveys would be conducted, construction activities would avoid elderberry shrubs to the maximum extent feasible, elderberry shrub replacement would occur in consultation with USFWS, habitat improvements would be implemented, and USACE would consult with USFWS under Section 7 of the ESA. (Similar)

Impact 4.7-h: Impacts on Northwestern Pond Turtle and Burrowing Owl

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for direct disturbance of northwestern pond turtle or burrowing owl habitat. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Floodwaters could inundate habitat areas and result in direct mortality of northwestern pond turtles. Burrowing owls could also be adversely affected by winter flooding as a result of either direct mortality or inundation and destruction of burrows. The magnitude of these impacts would depend upon the flooding duration, depth, rate, timing, and location. Therefore, a precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Adverse effects on suitable northwestern pond turtle habitat in the Phase 4b Project area would include the permanent loss (see Table 4.7-5 for acreage) of a small amount of relatively unvegetated irrigation/drainage canals within the proposed construction footprint of the Sacramento River east levee, NCC south, PGCC west levee, and NEMDC west levee. Construction of the realigned West Drainage Canal would result in the temporary loss of suitable turtle habitat. Development of the South Fisherman’s Lake and Triangle Properties Borrow Areas would potentially temporarily convert potential northwestern pond turtle habitat (e.g., irrigation and drainage ditches) to non-usable habitat. As described in Section 2.3.3, “Borrow Sites,” in selecting borrow sites, consideration would be given to ensure that activities result in minimal adverse impacts to the environment.

Habitat losses for northwestern pond turtles would be offset by the proposed habitat creation components of the Adjacent Levee Alternative (Proposed Action), including creation of managed marsh habitat in the Fisherman’s Lake Borrow Area, as described in the Phase 4a EIS and EIR, and creation of managed marsh habitat at Brookfield. Northwestern pond turtles would also benefit from the creation of canal habitat for giant garter snake.
implemented as part of the NLIP programmatic conservation strategy. There is potential for direct loss of pond turtles, however, if they are present within the affected habitats.

Project construction and implementation could result in the destruction of burrows occupied by burrowing owls should they occur within the adjacent levee footprint of the Sacramento River east levee; along the existing or West Drainage Canal; along the NCC, PGCC, or NEMDC; or within active borrow areas within the Phase 4b Project area. Burrowing owls are known to occur along the NEMDC South, west of East Levee Road. There is potential for direct loss of burrowing owls to occur if they are present within the affected habitats.

The direct loss of northwestern pond turtles and the potential for destruction of burrows occupied by burrowing owls would be a potentially significant impact. (Similar)

Mitigation Measure 4.7-h: Conduct Focused Surveys for Northwestern Pond Turtles and Burrowing Owls, Relocate Northwestern Pond Turtles as Needed, Minimize Potential Impacts on Burrowing Owls, and Relocate Burrowing Owls as Needed

To reduce impacts on northwestern pond turtle and burrowing owl, the project proponent(s) shall implement the following measures:

- A qualified biologist retained by the project proponent(s) shall conduct surveys for northwestern pond turtle in aquatic habitats to be dewatered and/or filled during project construction. Surveys shall be conducted immediately after dewatering and before fill of aquatic habitat suitable for pond turtles. If pond turtles are found, the biologist shall capture them and move them to nearby areas of suitable habitat that would not be disturbed by the project.

- The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by the project proponent(s), that construction is implemented in a manner that minimizes disturbance of potential nesting habitat for burrowing owls (e.g., removal of potential nesting habitat shall be conducted during the non-nesting season, to the extent feasible and practicable, to minimize the potential for loss of active nests).

- The biologist shall conduct pre-construction surveys to identify occupied burrowing owl burrows in the vicinity of construction areas. Surveys for burrowing owl shall be conducted before project activities are initiated at any time of year. Surveys shall be conducted in accordance with standardized protocols, including DFG’s Staff Report on Burrowing Owl Mitigation (DFG 1995), and NBHCP requirements. If an occupied nest burrow is found, an appropriate buffer that minimizes potential for disturbance of the nest shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted by a qualified biologist to ensure that project activity does not result in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.

- If an occupied burrowing owl burrow that does not support an active nest is found, the project proponent(s) shall develop and implement a relocation plan, in coordination with and subject to approval of DFG and USFWS, and consistent with requirements of the NBHCP, DFG’s Staff Report on Burrowing Owl Mitigation (DFG 1995) and the Airport
Wildlife Hazard Management Plan (WHMP). Relocation is anticipated to occur through passive exclusion of owls from the project site (using one-way doors at the burrow entrances). The owls would then be able to reoccupy the area after construction is complete. Because the project would generally result in temporary disturbance of burrowing owl habitat and conversion from one suitable habitat type to another, no mitigation for temporary burrow or habitat loss would be required.

Responsibility: Project proponent(s)
Timing: Before construction

Implementing this mitigation measure would reduce the potential impact to a less-than-significant level for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because northwestern pond turtles would be physically relocated (if present) and construction would be implemented in a manner that reduces loss of nesting habitat and direct mortality of burrowing owls (if present). (Similar)

Impact 4.7-i: Disturbance to Special-Status Vernal Pool Crustaceans

**No-Action Alternative**

No Phase 4b Project Construction

Under the No-Action Alternative, there would be no Phase 4b Project improvements to the Natomas perimeter levee system. Therefore, there would be no impact on special-status vernal pool crustaceans and their habitats. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could destroy special-status crustaceans and their habitats, depending on timing, location, and duration of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact, whether beneficial or adverse is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

Vernal pools within the Phase 4b Project area could support two Federally listed vernal pool crustaceans (vernal pool fairy shrimp and vernal pool tadpole shrimp) along the toe of the existing landside NEMDC west levee, and within the Triangle Properties Borrow Area and the Lower Dry Creek woodland mitigation planting area. Vernal pools that remain inundated for an adequate period (18 days for vernal pool fairy shrimp and 41 days for vernal pool tadpole shrimp) have the potential to support vernal pool crustaceans. Both vernal pool fairy shrimp and vernal pool tadpole shrimp have historic documented occurrences along the NEMDC and recent documented occurrences east of the Natomas Basin within 2 miles of the Phase 4b Project area. However, it is unlikely that the vernal pools along the landside of the NEMDC support vernal pool crustaceans because of the shallow nature of the depressions and the high percentage of nonnative annual grasses that have colonized these depressions. Additionally, the eastern portion of the Natomas Basin is largely developed for agricultural purposes. The scarcity of the vernal pools along the NEMDC and the lack of suitable habitat surrounding the Phase 4b Project area decrease the probability that viable populations of vernal pool fairy shrimp and vernal pool tadpole shrimp would be found along the landside of the NEMDC west levee within the Phase 4b Project area. However, the vernal pools within the Triangle Properties Borrow Area and the Lower Dry Creek woodland planting area are part of a vernal pool complex that could provide habitat for vernal pool crustaceans because these areas tend to have a...
longer wet phase as a result of the natural undulating topography of these areas and the surrounding undisturbed annual grassland habitat.

California linderiella, while no longer a DFG species of concern, is covered under the NBHCP; this species often co-occurs with vernal pool fairy shrimp. The loss of vernal pool habitat within the Phase 4b Project footprint would result in the conversion of vernal pool habitat along the NEMDC North landside levee toe to annual grassland habitat. This impact is considered potentially significant. (Greater)

Mitigation Measure 4.7-i: Survey for Presence or Absence of Vernal Pool Invertebrates, Avoid Disrupting Vernal Pool Habitat, and Implement Measures to Mitigate Loss of Habitat

The project proponent(s) shall implement the following measures to reduce or avoid impacts to special-status vernal pool crustaceans:

► Ground disturbance within 250 feet of seasonal wetland habitat shall be avoided to the extent feasible and practicable. The 250-foot buffers shall be clearly identified by staking or flagging. All project activity shall be prohibited within the buffer areas. If maintenance of these buffers is not feasible, or if changes in drainage associated with project implementation are projected to result in the loss or degradation of seasonal wetlands, additional mitigation shall be required as described below.

► USACE shall initiate Section 7 consultation with USFWS under Section 7 of the ESA, and the project proponent(s) shall consult with DFG under CESA regarding potential construction-related impacts to Federally listed vernal pool crustaceans and state-listed vernal pool crustaceans, respectively. The project proponent(s) shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes to ensure that impacts are avoided and/or minimized.

► If loss or alteration of potential habitat is determined to be unavoidable, appropriate survey measures to determine the presence or absence of vernal pool crustaceans shall be conducted. A complete survey for vernal pool crustaceans consists of sampling for either two full wet season surveys done within a 5-year period, or two consecutive seasons of one full wet season survey and one dry season survey (or one dry season survey and one full wet season survey) (USFWS 1996). Wet season surveys must begin no later than 2 weeks after the initial inundation of seasonal wetland habitat, and must be adequately sampled once every 2 weeks until the habitat is no longer inundated, or until the habitat has experienced 120 days of continuous inundation. Dry season surveys require the collection of 10 soil samples after pools have dried. Surveys need to be conducted by a qualified biologist holding the required permits.

► If no endangered vernal pool crustaceans are found, a letter report documenting survey methods and findings shall be submitted to USFWS, and no further mitigation is necessary. Should the presence of either vernal pool tadpole shrimp or vernal pool fairy shrimp be confirmed, consultation with USFWS will be required, and an incidental take permit may be required. During this consultation, an appropriate and feasible mitigation plan shall be developed and provided to USFWS for approval. The plan shall include, but would not necessarily be limited to, the preservation and creation of habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp.

► Alternatively, if loss or alteration of potential habitat is determined to be unavoidable, the project proponent(s) may elect to assume presence in the vernal pools rather than sampling for special-status vernal pool crustaceans and mitigate for loss of the species at
a USFWS approved mitigation bank at a minimum ratio of 2:1. The mitigation ratio that is ultimately required will be determined by USFWS through the Section 7 ESA process.

- Vernal pool complexes on the Triangle Properties Borrow Area shall not be used for borrow material.

**Responsibility:** Project proponent(s)

**Timing:** Before construction

Implementation of Mitigation Measure 4.7-i would reduce this impact to vernal pools outside of the project footprint to a less-than-significant level for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because of the avoidance buffers that would be placed around vernal pools outside of the widened levee footprint along the west levee of NEMDC North, and the commitment to provide vernal pool habitat for special-status vernal pool crustaceans at ratios approved by USFWS and at a USFWS-approved mitigation bank. (Similar)

### Impact 4.7-j: Temporary Construction-Related Impacts to Fish and Aquatic Habitats

#### No-Action Alternative

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project improvements would occur and there would be no potential for construction-related increases in sedimentation, turbidity, or contaminants, or direct disturbance to fish and aquatic habitats. There would be no impact. (Lesser)

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could introduce sediments and contaminants into stream channels, irrigation and drainage canals, and the Sacramento and American Rivers, potentially resulting in the loss of fish or aquatic habitat. Because the extent and location of a levee failure and subsequent flooding is unknown, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

### Water Quality Impacts: Turbidity, Sedimentation, and Contaminants

Fish population levels and survival have been linked to levels of turbidity and siltation in a watershed. Prolonged exposure to high levels of suspended sediment could create a loss of visual capability in fish, leading to a reduction in feeding and growth rates; a thickening of the gill epithelia, potentially causing the decrease of respiratory function; clogging and abrasion of gill filaments; and increases in stress levels, reducing the tolerance of fish to disease and toxicants (Waters 1995). Additionally, high levels of suspended sediments could cause the movement and redistribution of fish populations. Many fish are sight feeders, and turbid waters could reduce the ability of these fish to locate and feed on prey. Some fish, particularly juveniles, could become disoriented and leave areas where their main food sources are located, ultimately reducing their growth rates. Avoidance is the most common result of increases in turbidity and sedimentation. Fish will not occupy areas unsuitable for survival unless they have no other option.
Contaminants such as bentonite slurry, fuels, oils, and other petroleum products used in construction activities may be toxic to fish or may alter oxygen diffusion rates and can cause acute and/or chronic toxicity to aquatic organisms, thereby reducing growth and/or survival. Substances contributing to sedimentation, turbidity, or contamination can enter waterways directly during construction activities or through surface runoff.

The waterways potentially affected by construction of the Phase 4b Project (Sacramento River, NCC, PGCC, and NEMDC) provide, or are hydrologically connected to, waterways that provide habitat for special-status adult and juvenile Chinook salmon (all races), Central Valley steelhead, and green sturgeon, as well as for striped bass and American shad. Project construction activities could result in loss of fish and aquatic habitat through temporary increases in sedimentation and turbidity or the release of contaminants into waterways from improvements to the perimeter levees. Specifically, impacts to water quality that could affect fish and aquatic habitat include:

► extensive soil borrow excavation and placement for all levee improvements; clearing, grubbing/stripping, degrading, and construction of cutoff walls; and finish grading under the Adjacent Levee Alternative (Proposed Action);

► construction of the adjacent levee along Sacramento River east levee Reach A:16–20;

► slope flattening of the American River north levee Reach I:1–4;

► levee widening and slope flattening of NEMDC North and raising from Elkhorn Boulevard to approximately 1 mile upstream of Elverta;

► raising of a 500-foot-long section of the NEMDC extending downstream from Elkhorn Boulevard, and raising the west levee of the PGCC;

► dewatering and cofferdam installation associated with the erosion repair project elements, including the construction of a beaver wall along the PGCC west levee from SR 99 to Howsley Road, reconstruction of the low-flow channel in NEMDC South located downstream of City of Sacramento Sump Pump 157, and placement of a rock berm between Sump Pump 157 and the reconstructed low-flow channel;

► rock slope protection that would be installed along the PGCC west levee at the confluence with Curry Creek, Pleasant Grove Creek, at the Howsley Road Bridge west abutment, and at the Pierce-Roberts Drain; and

► rock slope protection that would be installed along the NEMDC west levee at the confluence with Dry Creek and Arcade Creek.

These activities could impair water quality for fish if soils or contaminants enter waterways directly or through surface runoff and hydrologic connection. Modifications to pumping plants and/or their pipelines could result in loss of fish and aquatic habitat through temporary increases in sedimentation and turbidity or the release of contaminants into waterways. These impacts could result from:

► raising and replacing discharge pipes and installing valves constructed on the waterside levee shoulder at RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8; and City Sump Pumps 160, 102, and 58;

► constructing new outfalls and related dewatering at RD 1000 Pumping Plant Nos. 6 and 8, and City Sump Pumps 160, 102, and 58; and potentially modifying the landside intake channel at RD 1000 Pumping Plant Nos. 6 and 8;

► regrading of the waterside slope at RD 1000 Pumping Plant No. 8, and removing the waterside cutoff structure at City Sump Pump 58; and

► potentially relocating City Sump Pump 102 outside of the modified levee footprint.
The PGCC does not provide habitat for, nor is it known to support, special-status fish species. However, temporary increases in sedimentation and turbidity or the release of contaminants into the PGCC could result in impaired water quality in the NEMDC, a watercourse that is known to support special-status fish.

Other elements of the Adjacent Levee Alternative (Proposed Action), including the relocation and construction of the West Drainage Canal, private irrigation and drainage ditch relocation, road reconstruction, and private well and utility relocation, could impair water quality for fish if soils or contaminants enter waterways directly or through surface runoff. The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would have similar impacts on fish and aquatic habitat resulting from the waterside removal of woody vegetation along the NEMDC South west levee. The removal of SRA is addressed above under Impact and Mitigation Measure 4.7-a. However, under the Fix-in-Place Alternative, waterside removal of large woody vegetation would also occur along the Sacramento River east levee to comply with USACE levee guidance that requires the removal of vegetation greater than 2 inches in diameter on the levee slopes and within 15 feet of the waterside and landside levee toes (USACE 2000), resulting in a greater loss of SRA.

**Disturbance to Fish and Aquatic Habitats**

In-water work that could cause direct disturbance or injury to fish and aquatic habitats would include the following:

- dewatering areas that require erosion control and placement of riprap on the channel bank or within the channel bed for erosion control using a barge or excavator could cause disturbance to fish and aquatic habitats;

- dewatering a portion of the NCC at the SR 99 Bridge to install underseepage remediation;

- potential dredging to accommodate modifications to the intake channels associated with RD 1000’s Pumping Plant Nos. 6 and 8 that could result in habitat disturbance and direct effects to fish and other aquatic organisms; and

- pile driving/vibratory hammer use from construction of the cofferdam for the outfall construction at RD 1000’s Pumping Plant Nos. 6 and 8, and City Sump Pumps 160, 102, and 58; and the potential removal of culverts under the PGCC east and west levees that could result in sound pressure effects to fish.

The construction of a sheetpile cofferdam and dewatering at the RD 1000’s Pumping Plant Nos. 6 and 8 and City Sump Pumps 160, 102, and 58 outfall installation site; potentially removing culverts under the PGCC; and erosion site repairs along the PGCC and NEMDC could result in underwater sound pressure effects and fish stranding if fish are present in the immediate work area during construction activities. All in-water work would be conducted during periods when sensitive fish species are least likely to be present, and a fish rescue plan would be implemented to minimize the potential for stranding of individual fish in the relatively small area within the cofferdam. Available information indicates that exposure of fish species to underwater sound pressure levels exceeding approximately 180 decibels (dB) may result in sublethal (e.g., damage to ear, hearing impairments, behavioral implications including delays in migration) or lethal (e.g., ruptured swim bladder, internal bleeding) effects (Laughlin 2005). These critical sound levels exceed levels that are anticipated to be associated with project-related construction activities, as pile-driving activities with repetitive high peaks have been documented to generate up to about 115 dB at a distance of 10 feet. Therefore, this activity is expected to be well below critical sound pressure levels for fish mortality or injury, and avoidance of the construction area would be the anticipated behavioral response.

Individual fish, if present in the immediate work area during any of the above construction activities, could be injured by equipment used for these activities or the sound pressure generated by them. Behavioral avoidance of adverse habitat conditions by fish is anticipated to be the most common result of increases in disturbance. Fish and other aquatic organisms displaced from their habitat due to the application of riprap, placement of support
piles, localized dredging, cofferdam construction and dewatering, or general in-water construction activities could become vulnerable to predators or other unfavorable habitat conditions. Construction-related habitat disturbance could result in temporarily adverse affects to the aquatic food web and fish populations including listed species within the Phase 4b Project area boundaries.

Impact Summary

Potential sedimentation, increased turbidity, or the release and exposure of contaminants could adversely affect fish and aquatic habitats. Construction activities including rip rap placement, potential channel modifications, pile driving, cofferdam construction and dewatering, and general in-water construction could cause direct disturbance to fish and their aquatic habitats. Out-of-water construction activities could also occur at times of the year when there is potential for the presence of sensitive fish species/life stages in the Sacramento River, NCC, PGCC, or NEMDC during construction activities. For the above reasons, this impact would be potentially significant (Similar) for the Adjacent Levee Alternative (Proposed Action). For the Fix-in-Place Alternative, the extent of waterside vegetation removal along the Sacramento River east levee Reach A:16–20 would be greater than the Adjacent Levee Alternative (Proposed Action). The removal of SRA is addressed in Impact 4.7-a, above. The resulting potential for sediments to enter the Sacramento River under the Fix-in-Place Alternative is greater than the Adjacent Levee Alternative (Proposed Action). The impact would also be potentially significant (Greater).

Mitigation Measure 4.7-j: Implement Mitigation Measure 4.6-a, “Implement Standard Best Management Practices, Prepare and Implement a Stormwater Pollution Prevention Plan, Prepare and Implement a Spill Containment Plan, and Comply with National Pollutant Discharge Elimination System Permit Conditions;” Implement a Feasible Construction Work Window that Minimizes Impacts to Special-Status Fish Species for Any In-Water Activities; and Implement Operational Controls and a Fish Rescue Plan that Minimizes Impacts to Fish Associated with Cofferdam Construction and Dewatering

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures to reduce impacts to fish and aquatic habitats related to temporary and short-term construction-related increases in sediments and turbidity and release of contaminants, as well as direct disturbance, to a less-than-significant level. These measures shall be included in construction specifications along with any additional measures identified in necessary permits.

- The project proponent(s) shall implement Mitigation Measure 4.6-a, as described in Section 4.6, “Water Quality.” This measure requires filing a Notice of Intent (NOI) with the Central Valley RWQCB; implementing standard erosion and siltation measures and best management practices (BMPs); preparing and implementing a storm water pollution prevention plan (SWPPP); preparing and implementing a spill containment plan; and complying with the conditions of the National Pollutant Discharge Elimination System (NPDES) general stormwater permit for construction activity.

- The project proponent(s) shall identify and implement feasible in-water construction work windows in consultation with NMFS and DFG. In-water work windows shall be timed to occur when sensitive fish species/life stages are not present or least susceptible to disturbance (e.g., July 1–October 1). This measure would reduce potential construction-related direct impacts to special-status fish from dredging and/or construction of the cofferdam and dewatering, general in-water construction, and/or the placement of rock riprap because all in-water work would occur during the period of time that sensitive special-status fish (or life stages) would be least likely to be present in the construction area.

- USACE shall initiate Section 7 consultation with NMFS under Section 7 of the ESA, and the project proponent(s) shall consult with DFG under CESA regarding potential...
construction-related impacts to Federally listed fish species and state-listed fish species, respectively. The project proponent(s) shall implement any additional measures developed through the ESA Section 7 and CESA consultation processes, including Section 2081 permit conditions, to ensure that impacts are avoided and/or minimized.

- The cofferdam sheetpiles at the outfall structure construction sites shall be installed using a vibratory hammer when possible to minimize underwater sound pressure levels to the greatest extent feasible and associated effects to sensitive fish species. Vibratory hammers/pile drivers shall only be used during daytime hours and shall commence at low-energy levels and slowly build to impact force. If it is determined that a higher-intensity percussion hammer or pile driver would be required for installing the cofferdam or pilings, avoidance of potential adverse effects would be achieved by consulting with NMFS, USFWS, and DFG to determine the appropriate actions, which may include surveying the outfall site to determine fish presence prior to installation, and possibly modifying the work window accordingly.

- To reduce the potential for fish stranding or minimize the potential for harm during cofferdam dewatering activities, the project proponent(s) or its contractor shall implement a fish rescue plan. Prior to the closure of the cofferdam in the Sacramento River, seining by a qualified fisheries biologist (with a current DFG collection permit) will be conducted within the cofferdam using a small-mesh seine to direct and move fish out of the cofferdam area. Upon completion of seining, the entrance to the cofferdam will be blocked with a net to prevent fish from entering the cofferdam isolation area before the cofferdam is completed. Once the cofferdam is completed and the area within the cofferdam is closed and isolated, additional seining will be conducted within the cofferdam to remove any remaining fish. Once most of the fish have been removed from the isolated area, portable pumps with intakes equipped with 1.75 mm mesh screen shall be used to dewater to a depth of 1.5–2 feet. A qualified biologist shall implement further fish rescue operations using electrofishing and dip nets. All fish that are captured will be placed in clean 5-gallon buckets and/or coolers filled with Sacramento River, NCC, PGCC, or NEMDC water (depending on the location of the construction activity), transported downstream of the construction area, and released back into suitable habitat in the Sacramento River, NCC, PGCC, or NEMDC (depending on the location of the construction activity) with minimal handling. After all fish have been removed using multiple seine passes, electrofishing, and dip nets (as necessary), portable pumps with screens (see above) will be used for final dewatering. NMFS, USFWS, and DFG shall be notified at least 48 hours prior to the fish rescue.

**Responsibility:**  Project proponent(s)

**Timing:**  Before construction

Implementing this mitigation measure would reduce the potential impacts of increased sedimentation, turbidity, and direct disturbance to fish to a less-than-significant level because the use of BMPs (e.g., source control, detention basins, revegetation, spill containment plan, waterside construction outside of the flood season, erosion control), an in-water work window and operational controls, and a fish rescue plan would maintain surface water quality conditions in adjacent receiving waters and minimize disturbance to fish and aquatic habitats. (Similar)
Impact 4.7-k: Impacts to Fish Species Associated with Operation of Pumping Plants and Surface Drains

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, Phase 4b Project modifications to RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 would not occur. As a result, there would be no potential for impacts related to the operation of the pumping plants or outfalls. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Levee failure would cause flows into, and possibly out of the Natomas Basin, potentially stranding fish. Levee failure could also damage irrigation pumping plants, and depending on the magnitude and location of the levee failure, could result in the pumping plants being shut down for an unknown period of time. This could have an effect on fish entrainment, as well as sedimentation, turbidity, and contaminant concentrations at the outfalls. A precise determination of significance of the impacts is not possible and cannot be made because the extent of the magnitude of impact is unknown and whether it would be adverse or beneficial. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Interference with the Migration of Migratory Fish Species through the Creation of Attraction Flows at Drainage Outfalls

The Phase 4b Project includes modification to the pipes and associated pumping facilities at RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8, and City Sump Pumps 160, 102, and 58; and the reconstruction of the outfall at RD 1000 Pumping Plant Nos. 6 and 8 and City Sump Pumps 160, 102, and 58 under both action alternatives. Modification of the landside intake channel of RD 1000 Pumping Plant Nos. 6 and 8 may also occur.

RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 are drainage pumping plants with their pumps located on the landside of the Sacramento River east levee. New discharge pipes crossing the levee would be required to meet USACE requirements for perimeter levee integrity under flood conditions. Modifications to the pumps may also be required to accommodate the additional pressure from the increase in elevation to maintain the existing pumping rate. Relocation of City Sump Pump 58 may also be required on the landside of the levee. The new discharge pipes at RD 1000 Pumping Plant Nos. 1A and 1B would connect to the existing pipes on the waterside of the levee and would discharge into the river through the existing outfalls. There would be no change in the volume, timing, or quality of stormwater being discharged at RD 1000 Pumping Plant Nos. 1A, 1B, 6, and 8 and City Sump Pumps 160, 102, and 58 compared to the existing condition.

Water quality in the discharge water from the pumping plants would be required to meet NPDES permit requirements (see Mitigation Measures 4.6-b and 4.7-j); therefore, operation of these facilities would not substantially degrade water quality in the Sacramento River.

Anadromous salmonids, during their spawning migrations in the Sacramento River and its tributaries, use primarily olfactory cues to home to their natal streams once they reach the freshwater environment. There is the potential that the flows from the drainage pumps and surface drainage outfalls could create velocity gradients that could attract these fish to attempt to swim up the water discharge. During fall and winter, adult chinook salmon and steelhead are in the Sacramento River system (including the NEMDC and NCC) migrating upstream to
spawning grounds. If these fish become attracted to the flows from the outfall pipes, there is a potential to cause migration delays. With high river levels, the drainage outfalls could directly interface with NEMDC surface water and create a condition where fish could swim directly into the pipes. However, because salmonids imprint on olfactory cues particular to their stream of origin, the probability of flows from pumps or drainage outfalls interfering with migration is low. This impact is considered to be less than significant. (Similar)

Mitigation Measure: No mitigation is required.

Impact 4.7-l: Impacts on Successful Implementation of Habitat Conservation Plans

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, without Phase 4b Project levee improvements, vegetation removal from the waterside of the levee would be required to conform with USACE guidance regarding levee encroachments, eliminating habitat for several species covered by the NBHCP. This habitat supports the majority of Swainson’s hawk nest sites in the Natoma Basin. As described in Impact 4.7-f, above, the impact of the loss of this vegetation on Swainson’s hawks would be significant and may not be fully mitigable. Impacts on nesting habitat for Swainson’s hawks in the near-term (i.e., before compensation woodland plantings have developed sufficiently to provide replacement nesting habitat) could substantially affect the successful implementation of the NBHCP. Under the No-Action Alternative, therefore, this impact is considered significant. (Greater)

The Yuba-Sutter HCP is not an approved document at this time and therefore the No Action Alternative would not affect the successful implementation of the Yuba-Sutter HCP. Under the No-Action Alternative this impact is considered less than significant. (Similar)

Potential Levee Failure

Without Phase 4b Project improvements to the Natoma perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natoma Basin, all phases of NLIP must be implemented. TNBC’s reserve infrastructure would be subject to damage in the event of levee failure; however, the extent of such damage is uncertain. Without flood risk reduction provided by the project, restrictions would be placed on new urban development and remaining habitat would not be at risk for conversion due to development. Because there would be no habitat loss due to urban development, implementation of this alternative would not directly conflict with the implementation of the NBHCP. This potential impact would be less than significant. (Lesser)

Adjacent Levee Alternative (Proposed Action)

Implementation of the Adjacent Levee Alternative (Proposed Action) could jeopardize successful implementation of the NBHCP through the conversion of habitats and land uses.

Impacts on NBHCP-Covered Species Viability

The potential for the Adjacent Levee Alternative (Proposed Action) to threaten the viability of populations of certain covered species, reduce the effectiveness of the NBHCP’s conservation strategy, and adversely affect attainment of the goals and objectives of the NBHCP, could jeopardize successful implementation of the NBHCP. This would be a significant impact.
Impacts on Habitat Availability

The Adjacent Levee Alternative (Proposed Action) would not develop land within NBHCP permit areas except for purposes of upgrading the Natomas Basin perimeter levee system, including improvements to levees, excavation of borrow material, and modifications to drainage and irrigation systems. Construction of these improvements, however, would not cause a net loss in the habitat values provided by these lands for NBHCP-covered species in the Natomas Basin. As noted in Section 5.2, “Growth Inducement,” construction of the Phase 4b Project would not induce growth in the NBHCP permit areas but would rather accommodate already planned regional growth.

Impacts to habitat resulting from project implementation are summarized in Tables 4.7-1 through 4.7-7. Although temporary and permanent loss of habitat would result from implementation of the Adjacent Levee Alternative (Proposed Action), the overall habitat quality for NBHCP species that use these habitats is unlikely to be adversely affected. This is because many components of the proposed project would support attainment of NBHCP goals and objectives through: (1) the expansion of the amount of protected habitat available for NBHCP-covered species; (2) the consolidation of large areas of habitat, assisting in the expansion of TNBC reserve blocks in the northwestern and southwestern regions of the basin; (3) the connection of core habitat reserves that are distributed throughout the basin through the construction of new canals and the establishment of woodland corridors; and (4) the extension of currently protected habitat blocks by substantially increase acreage and patch size of these habitats.

Given the collective implementation of elements of SAFCA’s conservation strategy and proposed mitigation to compensate for temporary and permanent habitat loss, the proposed project would not jeopardize the implementation and efficacy of the NBHCP. However, if habitat creation/preservation is not effectively implemented to provide woodland habitat for NBHCP-covered species, an overall adverse effect could occur. This impact would be potentially significant.

Impacts on the Yuba-Sutter HCP

The Yuba-Sutter HCP is not an approved document at this time; therefore, the Adjacent Levee Alternative (Proposed Action) would not affect the successful implementation of the Yuba-Sutter HCP. This impact is considered less than significant.

Fix-in-Place Alternative

The impacts of the Adjacent Levee Alternative (Proposed Action) on successful implementation of the NBHCP would also occur under the Fix-in-Place Alternative, with the exception that under this alternative, there would also be extensive removal of riparian vegetation on the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments. This habitat is used by a variety of species covered by the NBHCP, and supports the majority of Swainson’s hawk nest sites in the Natomas Basin. As described in Impact 4.7-f, above, the impact of the loss of this vegetation on Swainson’s hawks would be significant and may not be fully mitigable. Impacts on nesting habitat for Swainson’s hawks in the near term (i.e., before compensation woodland plantings have developed sufficiently to provide replacement nesting habitat) could substantially affect the successful implementation of the NBHCP. Under the Fix-in-Place Alternative, therefore, this impact would be significant. (Greater)

As noted above, the Yuba-Sutter HCP is not an approved document at this time; therefore, the Fix-in-Place Alternative would not affect the successful implementation of the Yuba-Sutter HCP. This impact is considered less than significant. (Similar)
Mitigation Measure 4.7-l: Ensure that Project Encroachment Does Not Jeopardize Successful Implementation of the NBHCP and Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h

To reduce impacts on the successful implementation of the NBHCP, the project proponent(s) shall implement the following measures:

- Implement Mitigation Measures 4.7-a and 4.7-c through 4.7-h.
- Based on the current value-per-acre, the project proponent(s) shall contribute funds to TNBC to offset direct impacts to TNBC reserves on an acre-per-acre basis, drawing upon TNBC’s existing land surplus.

Responsibility: Project proponent(s)
Timing: See Mitigation Measures 4.7-a and 4.7-c through 4.7-h

Implementing this mitigation measure, and Mitigation Measures 4.7-a, and 4.7-c though 4.7-h, would reduce potential effects from the Adjacent Levee Alternative (Proposed Action) to a less-than-significant level because these measures would ensure that the Adjacent Levee Alternative (Proposed Action) would be implemented in a manner that is consistent with, and does not jeopardize successful implementation of, the NBHCP. Creating woodland and aquatic movement corridors and other replacement habitats, conducting protocol-level surveys for special-status plants and wildlife, implementing construction in a manner that reduces loss of habitat and direct mortality of species, implementing measures that are part of the NBHCP related to special-status species, and creating and implementing a management plan in consultation with USFWS and DFG would reduce the impact on consistency with the NBHCP.

Implementing this mitigation measure for the Fix-in-Place Alternative, however, would partially reduce the impact but not to a less-than-significant level. Because of the likely loss of a substantial amount of nesting habitat for Swainson’s hawk, these measures could be insufficient to ensure that the Fix-in-Place Alternative would not jeopardize successful implementation of the NBHCP. Thus, this impact under the Fix-in-Place Alternative would remain significant and unavoidable because there are no feasible mitigation measures to fully reduce this impact to a less-than-significant level.

4.7.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, there would be no impacts to sensitive aquatic habitats or impacts related to fish attraction at the drainage outfalls. However, impacts on waterside woodland, wildlife corridors, Swainson’s hawk nesting, and valley elderberry longhorn beetle cannot be fully reduced to less-than-significant levels without the successful creation of waterside planting areas sufficient in size to fully and adequately compensate for the removal of extensive amounts of waterside vegetation along the Sacramento River east levee. Because mitigation cannot be required for the No-Action Alternative, this impact would remain significant and unavoidable.

In the event of levee failure under the No-Action Alternative, impacts to waterside woodlands, wildlife corridors, fish, special-status plant and animal species, and sensitive aquatic habitats are uncertain. Although there would be some unknown level of fish mortality through physical injury and stranding of fish entering Natomas Basin through a levee breach and some impacts associated with degraded water quality on fish habitat, the severity of flood conditions can vary substantially, and the specific effects on fish cannot be reasonably predicted. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action), implementation of mitigation measures described above would reduce long-term impacts to woodlands, Swainson’s hawk, and wildlife corridors for aquatic species, bird...
species, fish, special status vernal pool crustaceans, and other special-status species to less-than-significant levels and would not result in residual significant adverse impacts. These measures would also ensure that the Adjacent Levee Alternative (Proposed Action) would not jeopardize successful implementation of the NBHCP. Although no permanent impacts would occur, impacts to woodland habitats would remain significant and unavoidable for many years before reaching a less-than-significant level because replacement plantings would require at least 10–15 years to mature. This temporal loss of woodland habitat would also result in significant and unavoidable impacts to Swainson’s hawk nesting habitat related to this temporal loss of habitat.

Implementation of mitigation measures described above for the Fix-in-Place Alternative would not be sufficient to fully mitigate impacts to woodland habitats, loss of wildlife corridors, or the likely loss of a substantial amount of nesting habitat for Swainson’s hawk along the waterside of the Sacramento River east levee. These measures would also be insufficient to ensure successful implementation of the NBHCP. Residual impacts would occur because of the extensive loss of waterside vegetation, the temporal loss of habitat while replacement vegetation matures, and the limited extent of the new plantings that would reduce the value of this replacement habitat to wildlife and bird movement. Because no other feasible mitigation measures are available, impacts under the Fix-in-Place Alternative would remain significant and unavoidable.

With implementation of the mitigation measures described in this section, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would not result in any residual significant impacts related to giant garter snake, valley elderberry longhorn beetle, northwestern pond turtle, burrowing owl, fish, or special status vernal pool crustaceans.

With implementation of the mitigation measures described in this section, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would not result in any residual significant impacts related to sensitive aquatic habitats, including wetlands. In fact, successful implementation of the mitigation measures for both action alternatives would have a beneficial impact on overall acreage and functions of waters of the United States in the Natomas Basin.
4.8 CULTURAL RESOURCES

This section evaluates the Phase 4b Project’s potential effects on cultural resources. Cultural resources include prehistoric archaeological sites and artifacts, historic-era buildings and structures, and places used for traditional Native American practices or other properties with special cultural significance to Native Americans (Traditional Cultural Properties [TCPs]).

This project is subject to both Section 106 of the National Historic Preservation Act (NHPA), hereinafter referred to as “Section 106,” and CEQA; each has specific cultural resources mitigation requirements. The regulatory setting for management of cultural resources is provided in Section 3.8, “Cultural Resources.” The requirements of the NHPA are described in Section 6.8, “Compliance with Federal Environmental Laws and Regulations.” In general, the standards and process required for identifying and managing effects on cultural resources under the NHPA are used for determining the significance of impacts under NEPA.

4.8.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.8.1.1 METHODOLOGY

This section describes the methods used to identify and evaluate cultural resources that may be affected by the Phase 4b Project.

Native American Tribal Consultation

In May 2008, USACE, SAFCA, and the State Historic Preservation Officer (SHPO) became signatories to a Programmatic Agreement (PA) (described in Section 6.8), concluding compliance with Section 106 (Appendix E1). Native American tribes who were consulted by USACE were the Ione Band of Miwok Indians, the Shingle Springs Band of Miwok Indians, and the United Auburn Community, and all were invited to participate in the PA. Native American monitors worked with SAFCA to assist in the treatment of Native American human remains and items associated with Native American burials discovered during the project inventory process, as required by the PA (Section VI).

EDAW (now AECOM) sent a letter of inquiry to the Native American Heritage Commission (NAHC) on June 12, 2007, asking for information or concerns regarding the project area, as well as a list of individuals or organizations that might have information or concerns regarding the project area. On June 19, 2007, Debbie Pilas-Treadway of the NAHC responded and indicated that no known sites were found in the Sacred Lands File that were located within the project area or in the immediate vicinity. Ms. Pilas-Treadway also provided a list of individuals who could be contacted concerning cultural resources in the project area. These individuals were sent contact letters on June 21, 2007, with information regarding the project and a request for any information they might provide or concerns that they might have about the project. This program of correspondence did not reveal new resources. The complete results of this program of investigation are described in the Phase 2 EIR (SAFCA 2007: 3.8-11). The correspondence is included in Appendix E2.

The NAHC also designated a most likely descendant (MLD) for the project, John Tayaba of the Shingle Springs Band of Miwok Indians. Mr. Tayaba has been designated as the MLD because he is a member of the Shingle Springs Band of Miwok Indians, and the Tribe’s aboriginal territory includes the NLIP project area. Mr. Tayaba is designated to provide input on how to reinter identified prehistoric human remains that are uncovered in the NLIP area with appropriate dignity per California Public Resources Code Section 5097.98. Representatives from SAFCA, USACE, AECOM, and Mr. Tayaba or his delegates meet bi-weekly to discuss management of cultural resources for the NLIP and milestones in the Section 106 process.
Information Center Records Searches

Records searches were performed in 2006 and 2007 for the entire NLIP footprint, which includes the proposed Phase 4b Project footprint. Most of the searches were conducted at the North Central Information Center (NCIC) of the California Historical Resources Information System, located at California State University, Sacramento. The NCIC records search covered portions of the project area in Sacramento County. Records searches were also conducted at the Northeast Information Center (NEIC), which maintains cultural resource records for Sutter County. The searches at both facilities included, but were not necessarily restricted to, an examination of the following resources:

- the State Office of Historic Preservation’s *Historic Property Directory and Determination of Eligibility* (2006),
- the National Register of Historic Places and California Registers of Historical Resources (2006),
- *California Inventory of Historic Resources* (1976 and updates),
- *California Historical Landmarks* (1996 and updates),
- *California Points of Historical Interest* (1992 and updates),
- *Caltrans Local Bridge Survey* (1987), and
- various historic maps.

The record search results are described in detail in Section 3.8.2.3, “Records Search Results.”

Inventory and Management of Resources Within the Phase 4b Project Area of Potential Effect

USACE and SAFCA are required to perform an inventory, evaluation, and finding of effect for identified resources for the area of potential effect (APE) for each project phase, under the executed PA, as described below (Stipulation IV[A]). Inventory and evaluation typically consists of the following steps:

- conducting a pedestrian survey of the project footprint;
- performing limited shovel testing or probing where ground cover impairs surface visibility;
- monitoring preconstruction geotechnical borings and backhoe excavations;
- documenting identified resources; and
- evaluating identified resources by application of eligibility criteria, and where necessary, limited test excavation to assist in resource evaluation.

A pedestrian survey has been completed for a portion of the Phase 4b Project footprint along the Sacramento River east levee and in the Fisherman’s Lake Borrow Area. However, an inventory of cultural resources has not been conducted for the majority of the elements of the Phase 4b Project, including the South Fisherman’s Lake Borrow Area. The project proponent(s) will complete an inventory of all project features that involve ground-disturbing work in native soils, including new proposed borrow locations. The project proponent(s) will also complete evaluations, findings of effect, and treatment of identified resources where required. Within the portion of the Phase 4b Project footprint that has been surveyed, four identified resources require evaluation to determine if they are historic properties or historical resources (see Table 4.8-1, below). If they are eligible for listing on the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), the project proponent(s) will make a finding of effect and make recommendations for further management in an Historic Property Treatment Plan (HPTP), as required under Stipulation V(A) of the PA. The remaining identified resources in the Phase 4b Project footprint have been determined ineligible for listing on the NRHP or CRHR (the SHPO has concurred with USACE’s and SAFCA’s findings).
4.8.1.2 **Thresholds of Significance**

**National Historic Preservation Act**

The Phase 4b Project would result in a significant impact on an historic property as defined under Section 106 if it would result in an adverse effect on that resource. An adverse effect would occur if the project would alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.

**California Environmental Quality Act**

The Phase 4b Project would result in a significant impact on a cultural resource if it would result in a substantial adverse change in an historical resource, as defined under CEQA. A substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired. The Phase 4b Project would also result in a significant impact on a cultural resource if it would disturb any interred human remains.

4.8.2 **Identified Resources**

Table 4.8-1 contains all identified resources, other than elements of RD 1000 (discussed separately under Impact 4.8-a, below) in the Phase 4b Project footprint. For all resources that are determined ineligible, no further management is required.

<table>
<thead>
<tr>
<th>Project Element</th>
<th>Resource/Type</th>
<th>Eligibility Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacramento River east levee Reach A:16–20—levee widening and/or slope flattening, and seepage remediation</td>
<td>CA-Sac-164/prehistoric site with burials on the waterside of the Sacramento River east levee</td>
<td>Nominated to the NRHP, assumed eligible, not listed in the NRHP online database at this time.</td>
</tr>
<tr>
<td>American River north levee Reach:1–4—levee widening and/or slope flattening, and seepage remediation</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>NEMDC North (west levee)—levee raising and widening and/or slope flattening, and seepage remediation</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PGCC west levee—levee raising and widening and/or slope flattening</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>NEMDC South (west levee), Station 313+00 to 318+50—levee raising and widening and/or slope flattening</td>
<td>CA-Sac-517H/historic debris</td>
<td>Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)</td>
</tr>
<tr>
<td>SR 99 bridge remediation at NCC south levee</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>West Drainage Canal realignment and bank improvements</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Riego Road Canal relocation</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Vestal Drain relocation</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Morrison Canal relocation</td>
<td>CA-Sut-139H (NLIP-6)/historic farm complex</td>
<td>Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)</td>
</tr>
<tr>
<td>Project Element</td>
<td>Resource/Type</td>
<td>Eligibility Status</td>
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<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Chappell Drain and Ditch improvements</td>
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<tr>
<td>Relocation of other private irrigation ditches on PGCC and NEMDC North</td>
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<tr>
<td>Relocation of private irrigation wells along the Sacramento River east levee and west levee of the NEMDC</td>
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<tr>
<td><strong>New Borrow Sites/Areas</strong></td>
<td></td>
<td></td>
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<tr>
<td>Excavation of South Fisherman’s Lake Borrow Area</td>
<td>CA-Sac-18/prehistoric archaeological site (lithic scatter)</td>
<td>Requires evaluation/test excavation</td>
</tr>
<tr>
<td>Excavation of Triangle Properties Borrow Area</td>
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<tr>
<td>Excavation of West Lakeside School Site</td>
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<tr>
<td><strong>Previously Analyzed Borrow Sites/Areas</strong></td>
<td></td>
<td></td>
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<tr>
<td>Fisherman’s Lake Borrow Area</td>
<td>CA-Sac-1115/H (NLIP-25)/historic farm complex</td>
<td>Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2009a)</td>
</tr>
<tr>
<td></td>
<td>CA-Sac-268/prehistoric archaeological site</td>
<td>Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2009b)</td>
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<tr>
<td></td>
<td>CA-Sac-494H/historic debris scatter</td>
<td>Requires evaluation/test excavation</td>
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<tr>
<td></td>
<td>NLIP-38/historic farmstead</td>
<td>Requires evaluation</td>
</tr>
<tr>
<td></td>
<td>NLIP-40/prehistoric archaeological site</td>
<td>Requires evaluation/test excavation</td>
</tr>
<tr>
<td>Krumenacher Borrow Site</td>
<td>CA-Sac-484H</td>
<td>Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)</td>
</tr>
<tr>
<td></td>
<td>CA-Sac-483/H</td>
<td>Determined ineligible for the CRHR and NRHP (USACE and SAFCA 2008)</td>
</tr>
<tr>
<td>Twin Rivers Unified School District Stockpile Site</td>
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<tr>
<td>Brookfield Borrow Site (managed marsh conversion)</td>
<td>Inventory complete; no resources located within borrow site</td>
<td></td>
</tr>
<tr>
<td><strong>Woodland Compensation Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American River Parkway downstream of SR 160</td>
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<tr>
<td>Dry Creek floodway east of the NEMDC</td>
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<tr>
<td>Reminders of parcels to be acquired in Reach A:16 where levee improvements and/or Riverside Canal would already use most of the parcels</td>
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</tr>
</tbody>
</table>

Notes: CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places
*For all resources determined ineligible, the SHPO has concurred with these findings during the course of Section 106 consultation.
**Fields for resources that require inventory and evaluation are indicated as "--."
4.8.3 IMPACTS AND MITIGATION MEASURES

This section describes the impacts of the Phase 4b Project on cultural resources and outlines treatment measures that may avoid or reduce the anticipated impacts. These measures would be implemented by the project proponent(s), in consultation with the SHPO and the MLD, as appropriate. The specific documents that will further define and describe mitigation measures and monitoring responsibilities include HPTPs and the Construction Monitoring and Inadvertent Discovery Plan that the project proponent(s) will prepare, in compliance with the PA.

Impacts that are significant under CEQA are also considered adverse effects under the NHPA.

Impact 4.8-a: Potential Changes to Elements of Reclamation District 1000 and the Rural Landscape District

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly disturb elements of RD 1000 and the Rural Landscape District. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented to ensure that the Basin has achieved 0.005 AEP (200-year flood risk reduction). A levee failure in the Natomas Basin could result in flooding that could alter elements of RD 1000. However, the major elements and overall character of RD 1000 are unlikely to be significantly or adversely affected because levee systems by their nature are subject to ongoing repair and upgrades. Repairs would thus be consistent with the character-defining elements of the landscape. This potential impact is considered less than significant. (Similar)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 3.8.2.2, “Historic Setting,” RD 1000 is a rural historic landscape district that contains numerous elements associated with flood damage reduction and drainage infrastructure. An evaluation of RD 1000 was conducted both to determine NRHP eligibility of the district and to evaluate whether the district would be significantly affected by flood damage reduction projects (levee modifications) planned and subsequently implemented by USACE as part of the American River Watershed Project (USACE 1991). RD 1000 was identified as eligible for inclusion in the NRHP as a Rural Historic Landscape District. Because RD 1000 was determined eligible for listing on the NRHP, it is also eligible for listing on the CRHR and is an historical resource under CEQA. The finding of effect statement concluded that USACE projects would adversely affect both contributing and noncontributing elements of RD 1000 by allowing for greater development to occur in the region. As a result, mitigation measures were adopted and incorporated into USACE’s project. These consisted of Historic American Engineering Record (HAER) documentation, which was prepared by Peak & Associates (1997), videotapes of historic properties, and a list of repositories where copies of the information would be made available to the public.

Work associated with the Phase 4b Project under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative may alter contributing elements of RD 1000. This work includes improvements to the perimeter levees for the Natomas Basin as well as improvements to pumping stations, many of which are contributing elements to this district. These changes may be consistent with the character-defining elements of...
RD 1000, including the levees and the landscape elements of the district, because flood damage reduction infrastructure, by its nature, requires ongoing maintenance and alteration. However, such changes could diminish the significance or integrity of contributing elements of the district, under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. This impact is considered potentially significant pending identification and evaluation of effects on contributing elements of RD 1000. *(Similar)*

**Mitigation Measure 4.8-a: Incorporate Mitigation Measures to Documents Regarding any Elements Contributing to RD 1000 and the Rural Landscape District and Distribute the Information to the Appropriate Repositories**

| Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative | The management of the cultural resources that constitute the contributing elements of RD 1000 is governed by the PA. Because the elements of the RD 1000 historic landscape district have already been recorded, a new inventory of these resources is not required under Stipulation IV(A) of the PA. After an APE has been determined per Stipulation III(C), a qualified architectural historian shall determine if contributing elements of the district are present in the APE. If contributing elements are present, the architectural historian shall update records for these resources and evaluate those elements to determine if they retain integrity. Because much of the Natomas Basin has been developed, it is possible that changes to the setting have diminished the integrity and thus eligibility of contributing elements in the APE. If the elements in the APE retain eligibility, the architectural historian shall make a finding of effect.

If there is an adverse effect to a contributing element (under Section 106) or a significant impact on the resource’s integrity as an historical resource (under CEQA), the architectural historian shall review existing HAER documentation and determine whether any augmentation of this documentation is needed. The original documentation for the American River Watershed Project (completed in 1997) contemplated changes to the setting of the district and thus provided comprehensive documentation to record the district before urbanization (Peak & Associates 1997). This original documentation was intended to adequately record and preserve records of the elements that may be affected. However, if this documentation is not sufficient for adversely affected and contributing elements, the project proponent(s) shall prepare an HPTP stipulating additional HAER documentation, or other similar treatment as required under Stipulation V(A). After consultation with the SHPO, the project proponent(s) shall implement the required documentation or treatment prior to construction. Any additional documentation that is needed shall be prepared and distributed to appropriate public repositories.

<table>
<thead>
<tr>
<th>Responsibility:</th>
<th>Project proponent(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing:</td>
<td>Prior to any project activity that would result in adverse effects</td>
</tr>
</tbody>
</table>

Implementing this mitigation and treatment measure would reduce the impacts of potential changes to elements of RD 1000 under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-significant level. If required, this treatment measure would be incorporated into an HPTP developed through consultation with the SHPO. *(Similar)*
Impact 4.8-b: Potential Damage or Disturbance to Known Archaeological or Architectural Resources from Ground-Disturbance or Other Construction-Related Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly disturb any known archaeological or architectural resources. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Substantial flooding could result in inundation, or scour at the location of a levee break, and damage or destruction to any cultural resources at the location of the break. Should a levee break occur at the location of a cultural resource, the resource could be obliterated by the scourhole (potentially 1,000 feet wide and 80 feet deep) that would be created by the levee break. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction of the Phase 4b Project may affect two identified prehistoric archaeological deposits: NLIP-40, which consists of a newly identified prehistoric resource that occurs in the Fisherman’s Lake Borrow Area and was not analyzed as part of the Phase 4a Project; and CA-Sac-18, another prehistoric archaeological deposit that occurs in the South Fisherman’s Lake Borrow Area (see Table 4.8-1). Because both of these resources occur within borrow sites that would be used under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, borrow activity may disturb these resources under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. These resources require evaluation to determine if they are eligible for listing on the NRHP or the CRHR. If these resources are eligible for listing on either of these registers and borrow activity would disturb these resources, this impact would be significant.

The prehistoric deposit recorded as CA-Sac-164 contains a mortuary assemblage and has been nominated to the NHRP; however, available data suggest that this resource occurs only on the waterside of the Sacramento River east levee, and thus would not be affected by Phase 4b Project construction activities. The historic farmstead documented as NLIP-38 has been identified in the Fisherman’s Lake Borrow Area, and requires evaluation. If this resource is determined eligible for listing on the NRHP or CRHR, and it would be demolished or altered during project activities, this impact would be significant. The historic archaeological deposit CA-Sac-494H consists of a scatter of historic-era debris that was also identified in the Fisherman’s Lake Borrow Area. This resource requires evaluation. If borrow activity would disturb this resource and the site is eligible for listing on the NRHP or CRHR, the impact would be significant.

The evaluation of eligibility and determination of effects on all identified resources would be made by consultation between the project proponent(s), the SHPO, and the MLD, as appropriate. The identified resources that require evaluation may be significant for their association with important historic themes, their data potential, or for their importance to local Native American groups, and may have the integrity to convey this significance. Such resources would be eligible for listing on the NRHP and the CRHR. As described above, it is possible that ground-disturbing work associated with the Phase 4b Project may, absent mitigation or treatment, result in significant impacts to NLIP-40, CA-Sac-18, NLIP-38, and CA-Sac-494H. This impact is considered potentially significant. (Similar)
Mitigation Measure 4.8-b: Avoid Ground Disturbance Near Eligible and Listed Resources to the Extent Feasible, Prepare a Finding of Effect, and Resolve any Adverse Effects through Preparation of an HPTP

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement the following measures:

► Complete an evaluation of identified resources, and determine the effect of proposed work on all eligible or listed resources in accordance with Stipulation IV(A) of the PA.

► Consult with the SHPO, the MLD, and other consulting parties such as Native American individuals and organizations, to develop appropriate treatment or mitigation in an HPTP, per Stipulation V(A) of the PA if the project would result in adverse effects on eligible resources.

► When feasible, treatment shall consist of documentation of the site and reduction of adverse effects by protecting the resource through capping or avoidance of the resource. Where physical impacts cannot be avoided and such physical impacts could damage the data these sites contain, including mortuary components, further mitigation may be required. Such mitigation may consist of data recovery excavations to retrieve those values and mortuary assemblages that contain significance for archaeology after consultation with and the agreement of the Native American MLD, where appropriate.

► Monitor potentially destructive construction in the vicinity of documented resources, as required under the Construction Monitoring and Inadvertent Discovery Plan.

Responsibility: Project proponent(s)

Timing: Evaluation, findings of effect, and treatment would be performed in phases, prior to construction of Phase 4b Project elements that have the potential to result in impacts on identified NRHP- or CRHR-eligible resources

Project implementation would involve ground-disturbing work that both covers large areas of land, and includes deep excavation within the existing and adjacent levee footprint. Flood damage reduction measures that only involve capping of sites with minimization of vibratory and compaction impacts may reduce significant impacts to less-than-significant levels. The complex and stratified geomorphology of the Basin as well as the magnitude of the construction are such that implementation of all treatment and mitigation may not fully reduce all adverse impacts to known archaeological or architectural resources under either the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative to a less-than-significant level. For example, identified sites may have buried components containing mortuary elements that cannot be adequately documented prior to intrusive work. Therefore, this impact would remain significant and unavoidable. (Similar)

Impact 4.8-c: Potential Damage to or Destruction of Previously Unidentified or Undiscovered Cultural Resources from Ground-Disturbance or Other Construction-Related Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists to directly damage or destroy previously undiscovered cultural resources, including historic-era and prehistoric resources. There would be no impact. (Lesser)
Potential Levee Failure

Without Phase 4b Project improvements to this system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Substantial flooding could occur and result in inundation of unknown subsurface prehistoric resources, or scour at the location of a levee break. However, before construction of the levee system, prehistoric resources would have been subject to the effects of periodic flooding over several centuries and are unlikely to be significantly affected by additional episodes of inundation. Should a levee break occur at the location of a previously unidentified and significant prehistoric or historic-era resource, the resource would likely be obliterated by the scourhole (potentially 1,000 feet wide and 80 feet deep) that would be created by the levee break. The magnitude of the impacts would depend upon the location of the levee breach, severity of the storm, and river flows at the time. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would include construction along the Sacramento River east levee, American River north levee, PGCC, and NEMDC; changes to the interior drainage and irrigation infrastructure; and excavation of borrow sites. These construction activities would involve ground disturbance and excavation that could damage or destroy previously undiscovered cultural resources.

Sacramento Valley floodplains and riverbanks were extensively occupied and used by prehistoric populations. Prehistoric occupation sites frequently took the form of mounds constructed above the natural ground surface by prehistoric human populations, but the upper portions of many of these sites have been destroyed by modern agricultural cultivation and leveling of fields. Thus the remains of these sites are no longer easily visible above ground. Additionally, intermittent flooding deposited layers of alluvium over prehistoric deposits, leaving these resources intact below grade with no surface manifestations. Areas within the Phase 4b Project footprint are also commonly covered with agricultural crops or residential developments such as lawns, driveways, and other impervious surfaces associated with residential development. These conditions may obscure both prehistoric and historic archaeological deposits.

The Natomas Basin also contains numerous historic-era resources such as irrigation features, ranches, and agricultural buildings that may not have been recorded and evaluated as part of RD 1000.

Technical work necessary to identify additional prehistoric and historic-era resources in the Phase 4b Project footprint is ongoing, and significant resources may be identified after EIS/EIR certification and approval. Any such resources could be adversely affected by construction-related and other ground-disturbing activities. It is possible that impacts on yet unidentified resources cannot be avoided through changes in project design or configuration of borrow sites identified in Chapter 2, “Alternatives.” This impact is considered potentially significant. (Similar)

Where cultural resources are buried below sterile soils or where mounds have been truncated with no surface manifestation, discovery prior to construction during cultural resources inventories is not always possible. Furthermore, proposed improvements such as cutoff walls would occur under the footprint of the existing levees. These levees would only be degraded immediately prior to construction; thus, there are no feasible methods of conducting a cultural resources inventory within the footprint of these activities. Degrading the levee prior to construction for cultural resource investigations would not be feasible because it would require demolishing the levee for cultural investigations during summer in advance of constructing and rebuilding the levee for the flood season, at substantial expense and project delay.
In a similar fashion, if significant historic-era resources occur within the footprint of Phase 4b Project improvements, it may not be possible to avoid alteration or demolition of these resources.

Excavation, grading, and other ground-disturbing activities required during construction of improvements and excavation of borrow from sites identified in Chapter 2, “Alternatives,” could encounter and damage previously unknown or unidentified historic-era and prehistoric cultural resources that may be eligible for listing on the NRHP, CRHR, or both, under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. This impact is considered potentially significant. (Similar)

Mitigation Measure 4.8-c: Train Construction Workers before Construction, Monitor Construction Activities, Stop Potentially Damaging Activities, Evaluate any Discoveries, and Resolve Adverse Effects on Eligible Resources, if Encountered

The project proponent(s) shall implement the following measures.

- Update record searches and perform additional literature review as necessary.
- Complete surveys to identify cultural resources in the Phase 4b Project footprint, per mitigation identified in the Phase 2 EIR (SAFCA 2007:3.8-31) at the program level.
- Resolve significant impacts on resources eligible for listing on the NRHP or CRHR as required under the PA.
- Implement Mitigation Measure 3.4-d from the Phase 2 Project SEIR (see below with some refinement), as appropriate within the project footprint to identify interred human remains (SAFCA 2009: 3.4-10).

Mitigation Measure 3.4-d: Conduct Additional Backhoe and Canine Forensic Investigations As Appropriate (Incorporated by Reference Herein)

The project proponent(s) may implement the following measures during Section 106 consultation, as appropriate:

- Additional inventory may be conducted at appropriate intervals along the Sacramento River east levee, using a backhoe excavator, to increase the sample of information at depths below 6 feet that cannot be reached with conventional shovel test methods if additional inventory is appropriate and feasible. Such methods may be used only when necessary to address potential project-related effects to cultural resources because other methods are ineffective, or project circumstances dictate that such resources must be identified in advance of construction. The project proponent(s) shall consult with the MLD regarding the use of such methods.

- Where this process or additional inventory efforts reveal other resources, canine forensic investigations may be used as a way of identifying interred human remains with minimal disturbance, and for further refinement of and understanding of the constituents of identified resources, where canine forensic investigations are appropriate and feasible.

- Before construction begins, a qualified professional archaeologist retained by the project proponent(s) shall give a presentation and training session to all construction personnel so that they can assist with identification of undiscovered cultural resource materials and avoid them where possible. Such training shall note the importance of these materials to
Native American groups that attach cultural significance to resources in the Phase 4b Project area.

► A qualified archaeologist shall monitor ground-disturbing construction activities where sensitivity for unidentified resources is high and such monitoring is feasible, and would provide a measure of protection against inadvertent damage to such resources. In areas of known sensitivity, such as archaeological sites containing Native American burials, a Native American monitor will be present to observe potentially destructive construction activities and to ensure proper treatment of human remains in accordance with State law. If a previously unidentified archaeological resource is uncovered during construction, ground-disturbing activities shall be halted in the vicinity of the find and the construction contractor, the project proponent(s), the MLD, the NAHC (if appropriate), and other appropriate parties shall be notified regarding the discovery. Where construction would consist of cutoff walls excavated in a bentonite and/or cement slurry, it is anticipated that it will not be possible to identify the precise location of any materials found in spoils or at soil mixing stations, thus construction cannot stop during excavation of cutoff walls if resources are discovered in spoils.

► The project proponent(s) shall then consult with the SHPO to determine the eligibility of the resource. If the project proponent(s), in consultation with the SHPO, concur that the resource is eligible and the project may result in adverse effects on the resource, the project proponent(s) shall prepare and implement an HPTP as required under the PA, Stipulation V(A). The HPTP shall be prepared in consultation with the SHPO, and other appropriate consulting parties such as Native American individuals or organizations as appropriate.

► Work may only resume when either all necessary treatment has been performed under the HPTP, or construction in the vicinity will not result in adverse effects, and that work does not encroach within 100 feet of the known boundaries of the resource, or the boundaries designated by the SHPO, per the PA, Stipulation V(B)(2).

**Responsibility:** Project proponent(s)

**Timing:** Complete surveys, additional backhoe testing, and canine forensics (as appropriate) before the start of ground-disturbing construction activities; train construction workers before construction; and monitor construction activities during construction

It may be possible to avoid resources or recover and preserve them through measures stipulated in an HPTP. However, as with all ground-disturbing construction impacts, there is always the possibility of disturbing and adversely affecting unidentified/buried resources before they can be discovered and appropriately protected. There is also the possibility that design constraints for proposed improvements and borrow sites would preclude the ability of the project proponent(s) to avoid impacts on significant resources identified during inventory efforts. Therefore, implementation of these mitigation measures may not fully reduce all impacts under the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative to a less-than-significant level. Thus, this impact would remain **significant and unavoidable. (Similar)**
Impact 4.8-d: Potential Discovery of Human Remains During Construction

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the discovery of human remains. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Substantial flooding could occur and result in inundation of unknown human remains, or scour at the location of a levee break. However, before construction of the levee system, these resources would have been subject to the effects of periodic flooding over several centuries. Should a levee break occur at the location of the prehistoric resource site, any interred and previously unidentified burials would be obliterated by the scourhole (potentially 1,000 feet wide and 80 feet deep) that would be created by the levee break. A precise determination of significance is not possible and cannot be made because it is unknown where such an event would occur and whether any resources would be affected. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Prehistoric human remains have been found at several prehistoric sites in the vicinity of the Phase 4b Project area. Previously unknown buried human remains may be unearthed, damaged, or destroyed during excavation activities associated with project construction and excavation of borrow from the sites identified in Chapter 2, “Alternatives.” This work includes construction of levee improvements, seepage remediation, and changes and improvements to drainage and irrigation infrastructure. Both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative have a high risk of disturbing previously undiscovered human remains because of the extent of ground-disturbing work required for the project. This impact is considered potentially significant. (Similar)

Mitigation Measure 4.8-d: Stop Work Within an Appropriate Radius Around the Find, Notify the Applicable County Coroner and Most Likely Descendant, and Treat Remains in Accordance with State Law and Measures Stipulated in an HPTP Developed in Consultation between the Project Proponent(s) and the SHPO

If human remains are uncovered during ground-disturbing activities, the project proponent(s) shall cease all ground-disturbing activities within the vicinity of the find, if known. If the discovery occurs in spoils removed from construction of cutoff walls, the remains shall be treated in accordance with State law. Because cutoff walls are constructed at great depth within a slurry of soil and bentonite and/or cement, it is anticipated that it will not be possible to pinpoint the location of human remains that may be disinterred during construction of these features, and it will not be feasible or useful to stop construction. Discovered remains removed from cutoff wall spoils will be treated as required by State law, as follows. The project proponent(s)’s archaeological monitors and/or the contractor shall notify the relevant county coroner and an archaeologist skilled in osteological analysis to determine the nature of the remains. If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (California Health and Safety Code Section 7050[c]). The NAHC will designate an MLD who may decide how to reinter the remains with appropriate dignity in an appropriate location. John Tayaba has been designated as the MLD for previous discoveries, and he
would likely make recommendations for reinterment of human remains in the event of a discovery.

Prehistoric remains are usually found in the context of an archaeological site. The treatment of any associated site shall be in consultation with the MLD, as required under the PA and Mitigation Measure 4.8-c. While unlikely, it is possible that ground-disturbing work may disinter human remains associated with an historic burial that is not subject to the jurisdiction of the NAHC. Any such resource shall be treated as an archaeological discovery as required by Mitigation Measure 4.8-c.

Responsibility: Project proponent(s)

Timing: During ground-disturbing construction activities, in the event of a discovery

Monitoring (Mitigation Measure 4.8-c) and discovery protocols would reduce the chance of damage to or destruction of previously undiscovered human remains. However, it is possible that despite construction monitoring and implementation of this mitigation measure, ground-disturbing work would disinter and damage human remains under either the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative. Therefore, implementation of this mitigation measure may not fully reduce the impact to potential interred human remains under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-significant level. Thus, this impact would remain significant and unavoidable. (Similar)

4.8.4 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, the significance determinations for potential impacts to known and undiscovered cultural resources and to undiscovered human remains due to levee failure are uncertain. Because of this uncertainty, these impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

As described under Mitigation Measures 4.8-b, 4.8-c, and 4.8-d, potential construction impacts on identified cultural resources, previously unidentified cultural resources, and interred human remains are potentially significant and unavoidable under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, despite the implementation of all feasible mitigation measures, because there is a potential that resources could still be adversely affected. Therefore, significant and unavoidable impacts would likely remain even with implementation of the recommended mitigation measures.
4.9 PALEONTOLOGICAL RESOURCES

4.9.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

Paleontological resources (fossils) are the remains or traces of prehistoric animals and plants that are 11,000 years old or older. This section assesses the potential for earthmoving activities associated with the Phase 4b Project to affect scientifically important fossil remains. Plate 3-4 shows the geologic formations in the project area.

4.9.1.1 METHODOLOGY

The potential paleontological importance of the project area can be assessed by identifying the paleontological importance of exposed rock units within the project site. Because the aerial distribution of a rock unit can be easily delineated on a topographic map, this method is conducive to delineating parts of the project area that are of higher and lower sensitivity for paleontological resources and to delineating parts of the project area that may require monitoring during construction.

A paleontologically important rock unit is one that (1) has a high potential paleontological productivity rating and (2) is known to have produced unique, scientifically important fossils. The potential paleontological productivity rating of a rock unit exposed in the project area refers to the abundance/densities of fossil specimens and/or previously recorded fossil sites in exposures of the unit in and near the project area. Exposures of a specific rock unit at the project site are most likely to yield fossil remains representing particular species in quantities or densities similar to those previously recorded from the unit in and near the project area.

The following tasks were completed to establish the paleontological importance of each rock unit exposed at or near the project area:

- the potential paleontological productivity of each rock unit was assessed, based on the density of fossil remains previously documented within the rock unit; and

- the potential for a rock unit exposed in the project area to contain a unique paleontological resource was considered.

In its standard guidelines for assessment and mitigation of adverse impacts on paleontological resources, the Society of Vertebrate Paleontology (SVP) (1995) established three categories of sensitivity for paleontological resources: high, low, and undetermined. Areas where fossils have been previously found are considered to have a high sensitivity and a high potential to produce fossils. Areas that are not sedimentary in origin and that have not been known to produce fossils in the past typically are considered to have low sensitivity. Areas that have not had any previous paleontological resource surveys or fossil finds are considered to be of undetermined sensitivity until surveys and mapping are performed to determine their sensitivity. After reconnaissance surveys, observation of exposed cuts, and possibly subsurface testing, a qualified paleontologist can determine whether the area should be categorized as having high or low sensitivity. In keeping with the significance criteria of the SVP (1995), all vertebrate fossils are generally categorized as being of potentially significant scientific value.

4.9.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to paleontological resources if they would directly or indirectly destroy a unique paleontological resource or site.
For the purposes of this analysis, an individual vertebrate fossil specimen may be considered unique or significant if it is identifiable and well preserved, and it meets one of the following criteria:

- a type specimen (i.e., the individual from which a species or subspecies has been described);
- a member of a rare species;
- a species that is part of a diverse assemblage (i.e., a site where more than one fossil has been discovered) wherein other species are also identifiable, and important information regarding life history of individuals can be drawn;
- a skeletal element different from, or a specimen more complete than, those now available for its species; or
- a complete specimen (i.e., all or substantially all of the entire skeleton is present).

For example, identifiable vertebrate marine and terrestrial fossils are generally considered scientifically important because they are relatively rare. The value or importance of different fossil groups varies, depending on the age and depositional environment of the rock unit that contains the fossils, their rarity, the extent to which they have already been identified and documented, and the ability to recover similar materials under more controlled conditions such as part of a research project. Marine invertebrates are generally common, well developed, and well documented. They would generally not be considered a unique paleontological resource.

**4.9.2 IMPACTS AND MITIGATION MEASURES**

**Impact 4.9-a: Disturbance of Unknown Unique Paleontological Resources during Earthmoving Activities**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no excavation activities would occur within the Phase 4b Project footprint or proposed borrow sites; therefore, no potential exists for the project to directly disturb any paleontological resources that may be present in those areas. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Because any paleontological resources in the Basin would be relatively deep within the ground and would have existed through numerous past flooding episodes, they would be unlikely to sustain damage in the event of flooding in the absence of improvements to the perimeter levee system. This potential impact is considered less than significant. *(Lesser)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

Areas along the Sacramento River east levee are associated with Holocene-age alluvium. By definition, sediments associated with Holocene-age alluvium are too young to contain paleontologically sensitive resources. Therefore, earthmoving activities in any of these sediments would result in no impacts on paleontological resources.

However, because of the number of recorded fossil sites in both the Riverbank and Modesto Formations within the Central Valley, they are considered paleontologically sensitive rock formations under SVP criteria. The discovery of Pleistocene vertebrate fossil remains in sediments referable to the Riverbank and Modesto Formations from Sutter and Sacramento Counties, as well as from Davis, Woodland, and numerous other areas
throughout the Central Valley, suggests the potential exists for uncovering additional similar fossil remains during construction-related deep excavation within portions of the Phase 4b Project area.

Both the Riverbank and Modesto Formations are located within the Phase 4b Project footprint. Certain construction-related activities in the Modesto Formation, such as enhancing levee embankments or forming berms on top of the existing ground surface, would not cause significant adverse impacts on paleontological resources because Pleistocene-age fossils would not be encountered until approximately 10 feet below the surface. However, excavations deeper than 10 feet would be required for installation of cutoff walls and relief wells. These improvements (and thus excavations deeper than 10 feet) would be constructed along the Sacramento River east levee, which is not in the Modesto Formation and thus is not expected to contain paleontologically sensitive formations. Cutoff walls would be installed in portions of the NEMDC, however, where the Riverbank Formation could occur. If the Riverbank Formation is encountered, unique paleontological resources could be damaged or destroyed; thus, this impact is considered potentially significant. (Similar)

Mitigation Measure 4.9-a: Conduct Construction Personnel Training and, if Paleontological Resources are Found, Stop Work Near the Find and Implement Mitigation in Coordination with a Professional Paleontologist

Before the start of construction activities in the Riverbank or Modesto Formations, construction personnel involved with earthmoving activities shall be informed by the project proponent(s) of the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction activities, and the proper notification procedures should fossils be encountered. This worker training may be either (1) prepared and presented by an experienced field archaeologist at the same time as construction worker education on cultural resources, or (2) prepared and presented separately by a qualified paleontologist.

If paleontological resources are discovered during earthmoving activities, the construction crew shall immediately stop work in the vicinity of the find. The project proponent(s) shall retain a qualified paleontologist to evaluate the resource and prepare a mitigation plan in accordance with SVP guidelines (1995). The mitigation plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations made by the paleontologist, in consultation with the project proponent, shall be implemented before construction activities can resume at the site where the paleontological resources were discovered.

Responsibility: Project proponent(s)
Timing: During earthmoving activities in the Riverbank or Modesto Formations as shown in Plate 3-4

Implementing this mitigation measure would reduce the impact to unique, scientifically-important paleontological resources discovered during construction or other earthmoving activities to a less-than-significant level. (Similar)

4.9.3 RESIDUAL SIGNIFICANT IMPACTS

Under the No-Action Alternative, no impacts would occur to paleontological resources. In the event of a levee failure under the No-Action Alternative, impacts would be less than significant.

With implementation of the mitigation measures described in this section, project implementation would not result in any residual significant impacts related to paleontological resources under the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative.
4.10 TRANSPORTATION AND CIRCULATION

4.10.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.10.1.1 METHODOLOGY

This section analyzes the potential impacts of the Phase 4b Project on traffic circulation and transportation systems and potential impacts related to emergency vehicle access and construction traffic hazards. Impacts on flight safety related to Airport operations are addressed in Section 4.16, “Hazards and Hazardous Materials.”

Project operations would not increase vehicle trips. There would not be any operations-related impacts on transportation and circulation; therefore, operations-related impacts are not discussed further in this EIS/EIR. Consequently, this analysis is focused on temporary and short-term construction-related traffic and transportation-related impacts.

Instead of a traffic analysis focused on level of service, which is appropriate for projects that are confined within a specific, discrete area and/or when the exact project-related traffic routes are known, this analysis uses the traffic analysis methodology from the Institute of Transportation Engineers (ITE) (1989). This methodology is appropriate for this EIS/EIR because the exact traffic routes are not known, and construction activities would be dispersed over a wide area. ITE recommends using the following screening criterion for assessing the impacts of development projects that create permanent traffic increases: “In lieu of other locally preferred thresholds, a traffic access/impact study should be conducted whenever a proposed development will generate 100 or more added (new) peak-direction trips to or from the site during the adjacent roadway’s peak hours or the development’s peak hours.” To account for the large percentage of heavy trucks associated with a large construction project, ITE recommends that the threshold level be reduced to 50 or more new peak-direction trips. For construction projects that create temporary and short-term traffic increases, this criterion is considered conservative by ITE (1989).

4.10.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) and alternatives under consideration were determined to result in a significant impact related to transportation and circulation if they would do any of the following:

► conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel, and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

► conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

► result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

► substantially increase hazards due to a design feature or incompatible uses;

► result in inadequate emergency access; or
► conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

As noted above in Section 4.10.1.1, “Methodology,” the traffic analysis in this EIS/EIR is not focused on level of service because the nature of the project does not lend itself to such an analysis (i.e., the exact traffic routes are not known and construction activities would be dispersed over a wide area). The Phase 4b Project was determined to result in a significant impact on traffic if the project would result in 50 or more new truck trips during the a.m. or p.m. peak hours.

The Phase 4b Project does not involve changes to air traffic patterns or other Airport operations that would affect air traffic patterns; therefore, this issue is not discussed further in this EIS/EIR.

The project would not permanently eliminate public transit, bicycle, or pedestrian corridors or facilities. In addition, the project would not include changes in nor would it conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. These issues are not discussed further in this EIS/EIR.

4.10.2 Impacts and Mitigation Measures

Impact 4.10-a: Temporary and Short-Term Increases in Traffic on Local Roadways

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to adversely affect traffic on local roadways. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Flooding of Natomas Basin roadways—Sacramento and Sutter County roadways, SR 99, I-5, and I-80—could be minor to extensive depending on the location and severity of the levee failure and the duration of flooding. Traffic rerouting could lead to minor to substantial traffic congestion on alternate roadways. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

Project construction would result in substantial temporary and short-term increases in traffic on local roadways. Construction-related traffic would consist of daily commute trips by construction workers and truck trips to haul materials (especially borrow) and supplies from outside the project area, as well as truck trips to haul waste materials off-site for disposal. Section 3.10, “Transportation and Circulation,” identifies the roadways in the project area (see Table 3.10-1) and includes the traffic count and level of service (LOS) data for these roadways, where available. Plate 2-6 shows the anticipated haul routes that would be used during project construction.

Work Crew Commuting and Construction Staging Traffic

Personnel, equipment, and other imported construction materials would reach the Sacramento River east levee, American River north levee, and other Phase 4b Project construction sites via Bryte Bend Road, an off-road haul route parallel to the existing landside toe of the Sacramento River east levee, and a combination of roadways that
may include I-5, SR 99, Powerline Road, Del Paso Road, San Juan Road, El Centro Road, West El Camino Avenue, Truxel Road, Gateway Oaks Drive, Northgate Boulevard, Arden-Garden Connector, Elkhorn Boulevard, Riego Road, Sankey Road, Natomas Road, Pacific Avenue, Fifield Road, Keys Road, and Howsley Road.

The total construction crew size for the Sacramento River east levee improvements would reach up to 60 workers per shift working two shifts. The total crew size for the American River north levee improvements would also reach up to 60 workers per shift working two shifts. The total crew size for the NEMDC North improvements would reach up to 55 workers per shift working two shifts, and the total construction crew size for the PGCC levee raise would also reach up to 55 workers per shift working two shifts. Other Phase 4b Project improvements would involve a crew size of up to 125 workers per shift at sites throughout the Natomas Basin. Construction crew members would travel to different project sites in the Natomas Basin from different directions and by way of different sets of roadways and intersections. It is also likely that some ridesharing would take place and that trips would occur before and after peak hours. Therefore, traffic from construction crew commutes is unlikely to substantially affect local roadways, even during the peak a.m. and p.m. hours.

### Haul Truck Traffic

Implementation of the Adjacent Levee Alternative (Proposed Action) would result in a substantial increase in traffic on local roadways associated with truck haul trips during construction activities. Haul routes proposed for transporting materials from borrow sites to construction areas are shown in Plate 2-6. Table 4.10-1 shows the maximum anticipated haul trips by levee segment for the Adjacent Levee Alternative (Proposed Action) and the public roads that would potentially be affected.

<table>
<thead>
<tr>
<th>Levee Segment</th>
<th>Haul Trips Per Day</th>
<th>Public Road Haul Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacramento River east levee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach A:16–19A</td>
<td>540</td>
<td>Del Paso and Powerline Roads (for West Lakeside School Site borrow use only), San Juan Road, and Bryte Bend Road</td>
</tr>
<tr>
<td>Sacramento River east levee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach A:19B–20</td>
<td>360</td>
<td>Del Paso and Powerline Roads (for West Lakeside School Site borrow use only), San Juan Road, Bryte Bend Road; potential use of Garden Highway or other surface streets (Gateway Oaks Drive and West El Camino Avenue) to allow completion of round trips if landside off-road haul route can only provide single-lane of traffic</td>
</tr>
<tr>
<td>American River north levee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach I:1–4</td>
<td>120</td>
<td>San Juan Road, El Centro Road, West El Camino Avenue, Truxel Road, and Northgate Boulevard</td>
</tr>
<tr>
<td>West levee of NEMDC North</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reaches F–G)</td>
<td>810</td>
<td>Howsley, Fifield, and Keys Roads; off-road haul route on landside levee toe</td>
</tr>
<tr>
<td>West levee of PGCC (Reach E)</td>
<td>566</td>
<td>Off-road haul route on landside levee toe</td>
</tr>
</tbody>
</table>

Source: Compiled by AECOM in 2010

Construction of the Sacramento River east levee and American River north levee improvements would require soil borrow material from the South Fisherman’s Lake Borrow Area and the West Lakeside School Site. The Fisherman’s Lake Borrow Area, previously analyzed as part of the Phase 4a Project (see Section 4.1.3, “Summary of Previous NEPA and CEQA Analyses of Borrow Sites”), could provide additional borrow material for these improvements if needed. The proposed Triangle Properties Borrow Area would be the primary source of borrow material for levee improvements along the PGCC and NEMDC North, and the Krumenacher Borrow Site and Twin Rivers Unified School District Stockpile Site (adjacent to the NEMDC west levee south of Elkhorn Boulevard) could be back-up sources of borrow material for improvements to NEMDC North.
The improvements to the Sacramento River east levee (Reach A:16–20) would involve haul trucks carrying soil borrow material from the South Fisherman’s Lake Borrow Area, primarily on Bryte Bend Road to an off-road haul route that would be constructed at the landside toe of the levee to allow haul trucks to deliver material to construction sites along the levee. Hauling from the West Lakeside School Site to the Sacramento River east levee (Reach A:16–20) would also use off-road haul routes to connect to the on-road haul routes shown on Plate 2-6. The primary corridors where construction activity would take place are off of public roadways, within and through the soil borrow areas, and within the adjacent levee alignment and dirt roads used for access to work areas. For Sacramento River east levee Reach A:19B–20 (between Marina Glen Way and Gateway Oaks Drive), a single lane of Garden Highway may be needed to complete haul trips because landside space may be too limited to provide a two-lane, two-way, off-road haul route. As an alternative to using one lane of Garden Highway, trucks could complete haul trips by using surface streets on the landside of the levee, including Gateway Oaks Drive and West El Camino Avenue.

Because the Triangle Properties Borrow Area, the Krumenacher Borrow Site, and the Twin Rivers Unified School District Stockpile Site are located close to construction sites along the west levees of the PGCC and NEMDC, borrow material would primarily be transported on the off-road haul routes shown on Plate 2-6 or moved overland via scrapers. Hauling from the Triangle Properties Borrow Area would use Howsley, Fifield, or Keys Roads, or a combination of these roads.

As shown in Table 4.10-1, haul trips for borrow material for the Sacramento River east levee (Reach A:16–20) would total up to 900 trips per day during the 156-day construction season. These trips would be divided between approximately 540 trips per day for Reach A:16–19A, and approximately 360 trips per day for Reach A:19B–20. Borrow material haul trips are anticipated to be approximately 120 trips per day for the American River north levee improvements (Reach I:1–4). Haul trips for borrow material for improvements to the west levees of the PGCC and NEMDC North would be up to 566 and 810 trips per day, respectively, with most trips taking place on the off-road haul route between the Krumenacher Borrow Site and the Triangle Properties Borrow Area (see Plate 2-6). A portion of the Phase 4a Project construction (Sacramento River east levee Reach B:13–15) could overlap with the Sacramento River east levee portion of the Phase 4b Project during the 2012 construction season. Some overlap of haul trips between these two project phases could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other’s traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site (see Plate 2-6).

**Road Closures**

In addition to delays caused by increases in traffic on local roadways related to construction activity, temporary and short-term road closures would be required to accommodate construction activities in the Phase 4b Project area. In Reach A:16–19A of the Sacramento River east levee, the landside lane of Garden Highway could be closed for up to 6 months to allow for construction of a cutoff wall. Through traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard. The closed portion of Garden Highway would shift along the levee crown as the cutoff wall is installed. In Reach A:19B–20 of the Sacramento River east levee, the landside lane of Garden Highway could also be closed for up to 6 months to allow for construction of a cutoff wall. In addition, because there may be inadequate room for a two-way haul route at the toe of the existing levee, surface streets may be used to allow completion of round trips by haul trucks traveling to and from the South Fisherman’s Lake Borrow Area and/or West Lakeside School Site. These surface street routes would either be Gateway Oaks Drive and West El Camino Road, or the waterside lane of Garden Highway. If the waterside lane of Garden Highway is used, it would only be open to local traffic. In addition, Garden Highway would be temporarily closed for up to 30 days at several locations (including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B) to allow for the installation of pipes.

For the proposed levee raise in Reach B:12B–13 (Station 662+00 to Station 680+00), Garden Highway would be closed for up to two months. However, access to waterside residences in this reach would be maintained at all times.
For levee improvements along the American River north levee (Reach I:1–4), all lanes of the portion of the Garden Highway/Arden-Garden Connector between I-5 and Northgate Boulevard would be completely closed for up to 6 months. Through-traffic would be detoured to West El Camino Avenue, SR 160, and Richards Boulevard.

Remediation of the SR 99 bridge over the NCC would entail construction of a removable barrier system, requiring lane closures and traffic controls. The northbound and southbound lanes of the NCC bridge would be closed for at least 2 weeks (1 week for each direction), and a total of up to 5 weeks to allow for set-up and take down of traffic controls and traffic bypasses. Traffic control would include a cross-median detour to route southbound traffic to the northbound bridge, which would be divided to allow one lane of travel in each direction. After the cutoff wall is installed and cured through the southbound lanes, the traffic detour would be reconstructed to route northbound traffic to the southbound bridge for installation of the cutoff wall through the northbound roadway.

In summary, these road closures, lane closures, and traffic controls would cause or contribute to temporary and short-term substantial increases in traffic levels on West El Camino Avenue, SR 160, Richards Boulevard, Gateway Oaks Drive, and SR 99 as traffic is detoured or slowed. In addition, these closures and traffic controls could cause traffic delays during the a.m. and p.m. peak commute hours.

**Impact Summary**

Traffic associated with the movement of equipment, construction materials, and construction personnel would involve travel to different project sites in the Natomas Basin from different directions and by way of different sets of roadways and intersections. Therefore, this traffic is unlikely to substantially affect local roadways, even during the peak a.m. and p.m. hours.

Implementation of the Adjacent Levee Alternative (Proposed Action) would result in a substantial increase in traffic on local roadways associated with truck haul trips during construction activities. In addition, road closures, lane closures, and traffic controls would cause or contribute to temporary substantial increases in traffic levels on several project area roadways as traffic is detoured or slowed, and these closures and traffic controls could cause traffic delays during the a.m. and p.m. peak commute hours. Specifically, increases in traffic would be caused both by the closure of Garden Highway and the Arden-Garden Connector (shifting Garden Highway traffic to nearby surface streets), and by the use of major surface streets (e.g., San Juan Road, West El Camino Avenue, Truxel Road, and Northgate Boulevard) by haul truck traffic. Compared to other local roads in the Natomas Basin, Garden Highway is a primary route for residents traveling to and from their homes. Overall, project construction would result in a substantial temporary and short-term increase in traffic on local roadways, and these temporary and short-term impacts are considered significant.

**Fix-in-Place Alternative**

Under the Fix-in-Place Alternative, construction-related trips would be the same as for all elements described for the Adjacent Levee Alternative (Proposed Action), except that haul trips associated with the Sacramento River east levee improvements would be approximately 7% greater than the Adjacent Levee Alternative (Proposed Action) (960 haul trips per day under this alternative compared to 900 trips per day under the Adjacent Levee Alternative [Proposed Action]). Upgrading the existing Sacramento River east levee in place under the Fix-in-Place Alternative would require the closure of both lanes of Garden Highway in an approximately 1,000-foot-long segment that would move along the levee as construction is completed for up to 6 months. Local access for homeowners would be provided, while through-traffic would be detoured around the construction area. The closure of Garden Highway would cause traffic and access delays on local roadways. In addition, because the levee would be widened 15 feet less than under the Adjacent Levee Alternative (Proposed Action), it is assumed that the landside off-road haul route could support two-way haul truck traffic, and local surface streets (Garden Highway or Gateway Oaks Drive/West El Camino Avenue) would not be needed to complete round trips.
As described above for the Adjacent Levee Alternative (Proposed Action), Garden Highway would be temporarily closed for up to 30 days at several locations (including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B) to allow for the installation of pipes. Also, for levee improvements along the American River north levee (Reach I:1–4), all lanes of a portion of Garden Highway/Arden-Garden Connector would be completely closed for up to 6 months between I-5 and Northgate Boulevard.

Compared to other local roads in the Natomas Basin, Garden Highway is a primary route for residents traveling to and from their homes. The prolonged closures that would be required to upgrade the levee in place and construct cutoff walls would result in substantial traffic and access delays. In addition, because the levee would be widened 15 feet less than under the Adjacent Levee Alternative (Proposed Action), it is assumed that the landside off-road haul route could support two-way haul truck traffic, and local surface streets (Garden Highway or Gateway Oaks Drive/West El Camino Avenue) would not be needed to complete round trips. Overall, traffic impacts would be similar to the Adjacent Levee Alternative (Proposed Action), and this impact is considered significant. (Similar)

Mitigation Measure 4.10-a: Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips

Before the start of construction in each construction season, the project proponent(s) and primary contractors for engineering and construction shall develop a coordinated construction traffic safety and control plan to minimize the simultaneous use of roadways by different construction contractors for material hauling and equipment delivery to the extent feasible and to avoid and minimize potential traffic hazards on local roadways during construction. Upon selection of borrow sites within the Phase 4b Project area, the traffic safety and control plan shall reflect affected roadways. Items (a) through (c) of this mitigation measure, as listed below, shall be integrated as terms of the construction contracts.

(a) The plan shall outline phasing of activities and the use of multiple routes to and from off-site locations to minimize the daily amount of traffic on individual roadways. The project proponent(s) shall ensure that the construction contractors enforce the plans throughout the construction periods.

(b) The construction contractors shall develop a traffic safety and control plan for the local roadways that would be affected by construction traffic. Before the initiation of construction-related activity involving high volumes of traffic, the plan shall be submitted for review by Caltrans and the agencies of the local jurisdictions (Sutter County, Sacramento County, and/or City of Sacramento) having responsibility for roadway safety at and between project sites. The plan shall call for the following elements:

- posting warnings about the potential presence of slow-moving vehicles;
- using traffic control personnel when appropriate; and
- placing and maintaining barriers and installing traffic control devices necessary for safety, as specified in Caltrans’s Manual of Traffic Controls for Construction and Maintenance Works Zones and in accordance with city/county requirements (Caltrans 1996).

The contractor shall train construction personnel in appropriate safety measures as described in the plan and shall implement the plan. The plan shall include the prescribed locations for staging equipment and parking trucks and vehicles. Provisions shall be made for overnight parking of haul trucks to avoid causing traffic or circulation congestion.
(c) Consistent with Mitigation Measure 4.11-a, “Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NOX, and PM\textsubscript{10} during Construction,” the track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventive measures. Tracked-out materials shall be removed within 1 hour from adjacent streets anytime such material track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations. All visible roadway dust tracked out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a HEPA filter equipped vacuum device shall be used for roadway dust removal.

(d) A Transportation Management Plan shall be prepared and submitted to Caltrans District 3 to address any points of access from the state highway system for haul trucks and other construction equipment, and traffic control as a result of construction activities at the SR 99 NCC bridge.

(e) Before the start of the first construction season, the project proponent(s) shall coordinate with Sutter and Sacramento Counties and the City of Sacramento to address maintenance and repair of affected roadways resulting from increased truck traffic.

(f) Before project construction begins, the project proponent(s) shall provide notification of project construction to all appropriate emergency service providers in Sutter County, Sacramento County, and/or the City of Sacramento, and shall coordinate with providers throughout the construction period to ensure that emergency access through construction areas is maintained.

(g) Before the start of construction, the project proponent(s) and primary contractors shall coordinate with Sacramento County and the City of Sacramento regarding any closures of Garden Highway and associated detours.

Responsibility: Project proponent(s) and construction contractors for all measures, except noticing for which SAFCA would be responsible

Timing: Prepare the traffic safety and control plan, create of off-road haul routes, and notify emergency service providers before the start of project construction; remove tracked-out materials during construction

Enforcement: Caltrans and City and County agencies

Implementation of this mitigation measure would reduce the impact, but not to a less-than-significant level. Given the high amount of hauling required for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, and the limited number of roadways in the project vicinity that would be suitable for hauling between borrow sites and project construction sites, it is possible that the volume of traffic during some periods may still exceed ITE thresholds despite the implementation of this measure. Because no other feasible mitigation measures are available to fully reduce this impact to a less-than-significant level, this impact would remain significant and unavoidable.

The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would require the temporary closure of Garden Highway. Even with implementation of this mitigation measure, there are no feasible mitigation measures available to fully reduce the impacts from the temporary and short-term closure of Garden Highway; therefore, these temporary and short-term impacts would remain significant and unavoidable.

(Similar)
Impact 4.10-b: Temporary and Short-Term Increases in Traffic Hazards on Local Roadways

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to temporarily increase traffic hazards. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. If any part of the levee system were to fail, flooding of Natomas Basin roadways—Sacramento and Sutter County roadways, SR 99, I-5, and I-80—could be minor to extensive depending on the location and severity of the failure and the duration of flooding and associated traffic hazards could be minor to severe. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown) Without improvements to the Natomas perimeter levee system, the risk of levee failure would remain high.

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

During project construction along the Sacramento River east levee (Reach A:16–20), Garden Highway intersections at Orchard Lane and up to 20 private parcel ramps would be reconstructed to accommodate the adjacent levee. In addition, along the American River north levee, Garden Highway intersections at Natomas Park Drive, Truxel Road, Arden-Garden Connector, Northgate Boulevard, and four private parcel ramps would require degrading, embankment rebuilding, and repaving to accommodate levee improvements. The design of the intersections would meet Sacramento County or City of Sacramento roadway design criteria.

As described under Impact 4.10-a, high volumes of slow-moving truck traffic could be associated with the construction activities on Phase 4b Project roadways. Under the Fix-in-Place Alternative, haul trips associated with the Sacramento River east levee improvements would be approximately 7% greater than the Adjacent Levee Alternative (Proposed Action), and the levee would be widened 15 feet less than under the Adjacent Levee Alternative (Proposed Action). Therefore, it is assumed that the landside off-road haul route could support two-way haul truck traffic, and local surface streets (Garden Highway or Gateway Oaks Drive/West El Camino Avenue) would not be needed to complete round trips under the Fix-in-Place Alternative.

Construction workers entering and exiting construction areas at the beginning and end of work shifts could also increase traffic hazards. In addition, trucks and other vehicles could track mud and gravel onto the local roadways, potentially posing driving hazards.

Pavement sections on the rural Sacramento County, Sutter County, and some City of Sacramento roadways in the project area were designed to carry low-volume traffic. The high-volume truck traffic anticipated during Phase 4b Project construction would accelerate wear and tear on a section of Howsley Road, Fifield Road, and Keys Road at the Triangle Properties Borrow Area and on Powerline Road, El Centro Road, San Juan Road, West El Camino Avenue, Truxel Road, Northgate Boulevard, and Gateway Oaks Drive in south Natomas. Besides shortening the life of pavement sections, high-volume truck traffic could cause road damage, such as cracks and potholes, which could create road hazards for other motorists.

The combination of the high volume of slow-moving truck traffic, potentially tracking mud and debris onto roadways; workers entering and exiting construction sites; periodic road and lane closures associated with levee
improvements; and potential damage to pavement would increase traffic hazards on local roadways during the construction period. This impact is considered significant. (Similar)


The project proponent(s) and its primary contractors for engineering design and construction shall implement Mitigation Measure 4.10-a, above.

<table>
<thead>
<tr>
<th>Responsibility:</th>
<th>Project proponent(s) and construction contractors for all measures, except noticing in which SAFCA would be responsible</th>
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</thead>
<tbody>
<tr>
<td>Timing:</td>
<td>Before the start of project construction</td>
</tr>
<tr>
<td>Enforcement:</td>
<td>Caltrans and City and County agencies</td>
</tr>
</tbody>
</table>

Implementing this mitigation measure would require the project proponent(s) prepare and implement a traffic safety plan, and would coordinate with the construction contractors and local and regional agencies regarding the distribution of traffic along haul routes and establishing alternative traffic routes. However, implementation of this mitigation measure may not fully reduce the impact to a less than significant because of the volume of trucks and construction traffic that would occur. Therefore, this impact would remain potentially significant and unavoidable. (Similar)

Impact 4.10-c: Temporary and Short-Term Disruption of Emergency Service Response Times and Access

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to directly disturb emergency service response times and access. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. A levee failure along the NCC or the Sacramento River east levee could result in minor to substantial flooding of the Natomas Basin, including the Airport, I-5 and I-80, and SR 99, as well as local roadways, which would result in a minor to substantial disruption of emergency service and response times. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related effect on traffic and circulation and emergency service response cannot be estimated. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative could delay emergency service response times because of the difficulty of emergency vehicles needing to pass through or near construction areas as discussed under Impacts 4.10-a and 4.10-b, above.
The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would increase traffic on local roadways associated with construction trips. In addition, temporary and short-term road closures associated with levee improvements could cause or contribute to temporary and short-term increases in traffic levels as traffic is detoured or slowed on some local roadways, SR 160, and SR 99. Increased traffic congestion could interfere with the use of main roadways for emergency evacuation routes. Garden Highway is the primary access for homes and businesses located on the waterside of the levee. Temporary and short-term construction closures, including an approximately 6-month closure of the landside lane of Garden Highway in Reach A:16–20 to allow for construction of a cutoff wall, would interfere with emergency access to these residences and businesses (see also Section 4.3, “Land Use, Socioeconomics, and Population and Housing”). In addition, Garden Highway would be temporarily closed for up to 30 days at several locations (including City of Sacramento Pump 160 and RD 1000 Pumping Plant Nos. 1A and 1B) to allow for the installation of pipes. Levee improvements along the American River north levee (Reach I:1–4) would require the closure of all lanes of a portion of Garden Highway/Arden-Garden Connector for up to 6 months, and the SR 99 NCC bridge remediation would involve lane closures for a period of up to 5 weeks as described in Impact 4.10-a.

Closures of Garden Highway would be required with traffic controls to maintain local access; however, delays in emergency service response times may still result. Because the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative could result in delays in emergency service response times, this impact is considered potentially significant. (Similar)

Mitigation Measure 4.10-c: Implement Mitigation Measure 4.10-a, “Prepare and Implement a Traffic Safety and Control Plan for Construction-related Truck Trips”

<table>
<thead>
<tr>
<th>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative</th>
<th>The project proponent(s) and primary contractors for engineering design and construction shall implement Mitigation Measure 4.10-a, above.</th>
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<td><strong>Responsibility:</strong></td>
<td>Project proponent(s) and construction contractors for all measures, except noticing for which SAFCA would be responsible</td>
</tr>
<tr>
<td><strong>Timing:</strong></td>
<td>Before the start of project construction</td>
</tr>
<tr>
<td><strong>Enforcement:</strong></td>
<td>Caltrans and City and County agencies</td>
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Implementing this mitigation measure would reduce the temporary and short-term impacts on emergency service response times and access to a less-than-significant level because before project construction begins, the project proponent(s) would provide notification of project construction to all appropriate emergency service providers in Sutter County, Sacramento County, and/or the City of Sacramento and would coordinate with providers throughout the construction period to ensure that emergency access through construction areas is maintained. (Similar)

Impact 4.10-d: Conflict with Adopted Policies, Plans, or Programs Supporting Alternative Transportation

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the Phase 4b Project to conflict with adopted policies, or programs supporting alternative transportation, or to prevent use of project roadways by alternative modes of transportation. There would be no impact. (Lesser)
Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. If any part of the levee system were to fail, flooding of Natomas Basin roadways could be minor to extensive depending on the location and severity of the failure and the duration of flooding, and associated effects on alternative modes of transportation could be minor to severe. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Sacramento County Department of Transportation is in the process of updating the Sacramento County Bikeway Master Plan (Klinker, pers. comm., 2009). Several designated Class I (off-street), Class II (on-street with lane markings), or Class III (designated on-street) bicycle routes are within the Phase 4b Project area. Future bicycle routes are planned in the area; a Class I off-street trail is planned along Garden Highway and on-street Class II routes are planned for several roadways including Powerline Road, Del Paso Boulevard, and Elkhorn Boulevard (City of Sacramento 2005:3.3-3). Implementation of the Phase 4b Project would not preclude future development of alternative transportation corridors or facilities (e.g., bike paths, lanes, bus turnouts) in the project area.

Bicycle use of roadways in the Phase 4b Project area occurs on roadways without bikeway designations. The Sacramento Area Bicycle Advocates have noted that Garden Highway is used extensively by recreational cyclists and increasingly by commuters (SAFCA 2009). Construction of levee improvements would temporarily require partial (Adjacent Levee Alternative [Proposed Action]) or full closure (Fix-in-Place Alternative) of Garden Highway, requiring bicyclists to use alternative routes or alternate modes of transportation. Additionally, the Sacramento County General Plan Circulation Element notes that routes used extensively for truck hauling have increased hazards for bicycles (Sacramento County 1993). Proposed on-road haul routes, as shown in Plate 2-6, include Powerline Road, Del Paso Road, El Centro Road, San Juan Road, West El Camino Road, Gateway Oaks Drive, Truxel Road, and Northgate Boulevard. Bike trails located along the NEMDC levees are also located in the Phase 4b Project area. Bicyclists using these routes would be exposed to increased hazards during construction. The potential increase in hazards for bicyclists using the Phase 4b Project area roadways and bike trails would be a temporary and short-term construction-related significant impact. (Similar)

Mitigation Measure 4.10-d: Prepare and Implement a Bicycle Detour Plan for Project Area Roadways and Bike Trails, Including Garden Highway and the NEMDC Levees

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of construction, the project proponent(s) or and primary contractors shall prepare a bicycle detour plan for roadways and bike trails that would be affected by project construction activities, including Garden Highway and NEMDC levees, in consultation with the County Alternative Modes Coordinator and/or City of Sacramento Bicycle and Pedestrian Coordinator, as applicable. The detour plan shall include posted signs clearly indicating closure points, truck haul routes, detour routes, and informational signs to notify motorists and bicyclists to share the roads. Signs shall be posted outside of the immediate project area in order to notify bicyclists of closure points and detours. The detour plan shall be in place before the start of construction, and shall be maintained and implemented throughout the construction period.
Responsibility: Project proponent(s) and construction contractors
Timing: Before the start of project construction
Enforcement: Caltrans, and City and County agencies

Implementing this mitigation measure would reduce the temporary and short-term impacts from construction-related disruption to bicycle facilities under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-significant level because construction-related damage would be repaired, access restored, and detour routes, roadway markings to designate temporary bike lanes, and informational signs would be provided. (Similar)

4.10.3 Residual Significant Impacts

Under the No-Action Alternative, impacts due to disruption of traffic circulation, traffic hazards, emergency service response times, bikeway conflicts, and access in the event of levee failure are uncertain. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Implementation of Mitigation Measure 4.10-a under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would not fully reduce the impacts created from the temporary and short-term increases in traffic levels from haul trucks during construction to a less-than-significant level because the volume of traffic during some periods may still exceed ITE thresholds; therefore, a residual significant impact would occur.

Impacts related to the temporary and short-term disruption of emergency service response times and access would be reduced to a less-than-significant level under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because emergency service providers would be notified before project construction begins.

Implementation of Mitigation Measure 4.10-a under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would not fully reduce traffic hazard impacts from temporary and short-term traffic increases to a less-than-significant level because of the high volume of slow-moving trucks and construction traffic that would occur; therefore, a residual significant impact would occur. Implementation of Mitigation Measure 4.10-d under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would reduce temporary and short-term bikeway impacts to a less-than-significant level because a bicycle detour plan would be prepared and implemented.
4.11 AIR QUALITY

4.11.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.11.1 METHODOLOGY

All increased pollutant emissions associated with the Phase 4b Project would be generated by construction-related activities. Construction emissions are described as temporary, but because of the multi-year construction schedule, these emissions are also considered to be “short-term” in duration. These temporary and short-term emissions, especially emissions of criteria air pollutants (i.e., respirable particulate matter less than 10 microns in diameter \([\text{PM}_{10}]\) and ozone precursors (e.g., reactive organic gases \([\text{ROG}]\) and oxides of nitrogen \([\text{NOX}]\)), have the potential to represent a significant air quality impact.

The method of analysis for short-term (temporary) construction-related, mobile-source emissions is consistent with the recommendations of the Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Feather River Air Quality Management District (FRAQMD). The Phase 4b Project would not result in operational emissions; therefore, long-term regional (operational) emissions were not estimated.

Project implementation would not result in any major sources of odor, and the Phase 4b Project would not involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, coffee roaster, wastewater treatment facility). Diesel exhaust, which is sometimes considered an objectionable odor source, would be associated with the use of on-site construction equipment, but it would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Thus, project implementation would not expose sensitive receptors to odorous emissions, and this issue is not discussed further in this EIS/EIR.

Project construction would generate emissions of diesel PM (DPM), which is identified by the California Air Resources Board (ARB) as a toxic air contaminant (TAC). Emissions of DPM have been related to long term health impacts including non-cancer chronic hazards and increased cancer risk. Mobile sources of DPM are largely regulated under California State programs, separately from stationary equipment. However, DPM emissions will result in short-term, temporary impacts and would not result in a long-term cancer risk to residential or worker receptors.

The following construction sources and activities were analyzed for emissions:

- Exhaust emissions from on- and off-road construction equipment, haul trucks, and employee commuter trips (all pollutants), based on estimated equipment schedules, and emission factors developed in SMAQMD’s Road Construction Emissions Model, Version 6.3.2.

- Fugitive dust emissions from on-site and off-site haul truck trips on paved and unpaved roads; fugitive dust emissions from material handling activities including haul truck unloading, scraper unloading, and bulldozer activity, based on estimated vehicle miles traveled, material loading (in tons per day), hours of operation, and Chapter 11 and 13 of EPA’s Compilation of Air Pollutant Factors (AP-42).

On- and Off-road Construction Equipment Emissions

Construction emissions were estimated using the Road Construction Emissions Model, Version 6.3.2, developed by SMAQMD for use in developing emissions inventories for CEQA projects. The Road Construction Emissions Model is derived from the CARB OFFROAD 2007 model (developed for off-road construction equipment emissions) and the CARB EMFAC 2007 model (developed for on-road vehicle emission). Emissions estimates for off-road construction equipment were based on 2010–2013 fleet mix averages, as provided by SMAQMD’s Road Construction Emissions Model, to provide conservative emissions estimates. Annual emissions for each
year of construction were estimated from appropriate emission factors, number of equipment, and activity periods as provided in Chapter 2, “Alternatives.”

Emission factors are based on one 8-hour work shift per day. Specific construction activities such as cutoff wall installation and road construction could occur 24 hours per day, 7 days per week (24/7). This analysis estimates emissions for 24/7 activities by multiplying the daily emission factors developed for one 8-hour shift per day by a factor of 3.0. Similarly, some construction activities could occur for 10–12 hours per day. Emission estimates for 10–12 hour activities multiply the emission factor developed for one 8-hour shift per day by 1.25 and 1.5, respectively. All activities that could occur for more than an 8-hour shift per day have been noted in the modeling analysis, provided in Appendix F.

**Fugitive Dust Emissions**

Fugitive dust emissions are associated primarily with site preparation and excavation of borrow material and vary as a function of conditional parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled on- and off-site. As noted above, fugitive dust emissions from construction equipment, haul trucks, and material handling were estimated using EPA AP-42 emission factors.

The Triangle Properties Borrow Area in Sutter County is the assumed primary source of soil borrow material for improvements along the west levees of the PGCC and NEMDC North. The Krumenacher borrow site and Twin Rivers Unified School District stockpile site in Sacramento County are the assumed primary sources of soil borrow material for improvements along NEMDC South. The South Fisherman’s Lake Borrow Area and West Lakeside School Site would be the primary sources of soil borrow material used for levee improvements along Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4. For modeling purposes and to capture worst-case impacts under both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, it was assumed that borrow and fill material would be transported an average of approximately 4 miles round trip on 50% paved and 50% unpaved haul routes; haul routes are shown on Plate 2-6.

The Phase 4b Project is proposed to be constructed in 2012–2016, with almost all of the construction activities during the 6–8-month construction season, which typically starts in May and runs through November. In some cases, work may begin in early April and extend as late as December 31. However, for purposes of modeling emissions for this EIS/EIR, it has been assumed that the construction season would be May through November.

Phase 4b Project components would be constructed in one or two construction seasons, depending upon the amount of construction involved. Major levee improvements could span two construction seasons, while more discrete improvements, such as pumping plant modifications, could be completed in a single construction season. Table 4.11-1 shows the timing of construction activities for the Phase 4b Project components that were assumed for modeling emissions across the 2012–2016 construction seasons.

Construction emissions from the proposed Phase 4b Project were estimated based on the construction schedule provided in Table 4.11-1. To ensure that worst case air quality impacts were captured, emissions estimates include both those from Phase 4b construction activities and those that would be produced by construction of components analyzed as part of previous phases that would occur during the 2012 construction season. Phase 4a Project construction that would occur during the Phase 4b Project construction period would include Sacramento River east levee Reach B:13–15 and all of the relocation of the Riverside Canal, as discussed in Chapter 2, “Alternatives.” For the PGCC west levee, the levee raise analyzed as part of the Phase 3 Project would be constructed as part of the levee raise addressed in the Phase 4b Project. Therefore, air quality emissions for overlapping construction on the PGCC (Phase 3 Project) are equivalent to the emissions estimated for the PGCC component of the Phase 4b Project. Construction activities associated with the “No-Action Alternative—Implementation of Phase 1, 2, 3, and 4a Projects Only” are summarized in Section 2.2.2.
### Table 4.11-1
Construction Schedule for the Adjacent Levee Alternative’s (Proposed Action’s) Major Project Components

<table>
<thead>
<tr>
<th>Major Project Component</th>
<th>Construction Season (May–November)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012 (%)</td>
</tr>
<tr>
<td><strong>Phase 4a Project – Overlapping Components</strong></td>
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</tr>
<tr>
<td>Sacramento River east levee Reach A:13–15</td>
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<tr>
<td>Riverside Canal</td>
<td>100</td>
</tr>
<tr>
<td><strong>Phase 4b Project – All Components</strong></td>
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<tr>
<td>Sacramento River east levee Reach A:16–20</td>
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</tr>
<tr>
<td>American River north levee Reach I:1–4</td>
<td>50</td>
</tr>
<tr>
<td>NEMDC North (Reaches F–G) levee raising</td>
<td>-</td>
</tr>
<tr>
<td>PGCC and NEMDC South (Reaches E and H) levee raising</td>
<td>-</td>
</tr>
<tr>
<td>PGCC and NEMDC South (Reaches E and H) waterside improvements</td>
<td>-</td>
</tr>
<tr>
<td>PGCC culvert remediation</td>
<td>-</td>
</tr>
<tr>
<td>SR 99 NCC Bridge remediation</td>
<td>100</td>
</tr>
<tr>
<td>West Drainage Canal</td>
<td>-</td>
</tr>
<tr>
<td>Riego Road Canal relocation</td>
<td>-</td>
</tr>
<tr>
<td>NCC south levee ditch relocations</td>
<td>100</td>
</tr>
<tr>
<td>RD 1000 Pumping Plant modifications</td>
<td>-</td>
</tr>
<tr>
<td>City of Sacramento Pumping Plant modifications</td>
<td>-</td>
</tr>
<tr>
<td>South Fisherman’s Lake Borrow Area and West Lakeside School Site excavation and reclamation</td>
<td>-</td>
</tr>
<tr>
<td>Triangle Properties Borrow Site excavation and reclamation</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; SR = State Route
Source: Data compiled by AECOM in 2010

Project-related emissions are estimated within the air districts that regulate them using the applicable mass emission thresholds for regional impact analysis. The Phase 4a Project components that would overlap into the Phase 4b Project (in the 2012 construction season) are located within Sacramento County.

#### 4.11.1.2 Thresholds of Significance

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to air quality if they would do any of the following:

- conflict with or obstruct implementation of the applicable air quality plan;
► violate any air quality standard or contribute substantially to an existing or projected air quality violation;
► result in a cumulatively considerable net increase of a criteria air pollutants for which the project region is nonattainment under any applicable Federal or state ambient air quality standards (including releasing emissions that exceed quantitative thresholds for ozone precursors);
► result in exposure of sensitive receptors to substantial concentrations of toxic air emissions or criteria air pollutants;
► create objectionable odors affecting a substantial number of people;
► generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
► conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The Phase 4b Project’s potential impacts related to greenhouse gas emissions are discussed in Chapter 5, “Cumulative and Growth-inducing Impacts, and Other Statutory Requirements,” under Section 5.1.5.12, “Climate Change.” As stated in Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management districts or air pollution control district may be relied upon to make the above determinations. Thus, the appropriate district-recommended emission thresholds as published in their respective CEQA guidance documents also applies to individual projects under their jurisdiction.

For levee improvements conducted in Sutter County, the FRAQMD Draft Indirect Source Review Guidelines and CEQA planning guidance (FRAQMD 2010) provide recommended thresholds of significance for Type 2 projects, or projects such as levee improvements that do not include an operational phase. An air quality impact was considered significant if implementation of the Adjacent Levee Alternative (Proposed Action) or alternatives under consideration would result in project construction emissions that exceed:

► 25 lb/day and 4.5 tons per year of ROG,
► 25 lb/day and 4.5 tons per year of NOx, and
► 80 lb/day of PM10.

For portions of the project that would occur in Sacramento County, based on SMAQMD’s Guide to Air Quality Assessment in Sacramento County (SMAQMD 2004), an air quality impact was considered significant if implementation of the Adjacent Levee Alternative (Proposed Action) or alternatives under consideration would do any of the following:

► generate construction-related emissions of criteria air pollutants or precursors that exceed the SMAQMD-recommended threshold of 85 pounds per day (lb/day) for NOx, or result in or substantially contribute (at a level equal to or greater than 5%) to emissions concentrations that exceed the national ambient air quality standards (NAAQS) or California ambient air quality standards (CAAQS) for any criteria pollutant; or
► generate long-term (operational) regional criteria air pollutant or precursor emissions that exceed the SMAQMD-recommended threshold of 65 lb/day for ROG and NOx, or result in or substantially contribute (at a level equal to or greater than 5%) to emissions concentrations that exceed the NAAQS or CAAQS for any criteria pollutant.

General Conformity requirements under the Code of Federal Regulation (CFR) 40 Part 93 require Federally funded projects to demonstrate conformance with applicable air quality planning efforts as specified under the Clean Air Act. Conformity may be demonstrated if estimated project emissions are below the de minimus thresholds presented below:
For construction emissions within the Sacramento Metropolitan Nonattainment Area:

- 25 TPY of ROG,
- 25 TPY of NOX, or
- 100 TPY of PM$_{10}$.

Project emissions in excess of the de minimus thresholds may choose to fully offset project impacts through a Federal and State enforceable offset program that has gone through the SIP approval process.

4.11.2 IMPACTS AND MITIGATION MEASURES

Impact 4.11-a: Temporary and Short-Term Emissions of ROG, NOX, and PM$_{10}$ During Construction

No-Action Alternative

**No Phase 4b Project Construction**

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no potential exists for project-related construction emissions. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Cleanup actions in the event of levee failure would likely require the use of construction equipment that would emit air quality pollutants. The amount and types of pollutants cannot be predicted and would depend on the magnitude of cleanup operations. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered to too speculative for meaningful consideration. *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action)**

The Adjacent Levee Alternative (Proposed Action) would result in the temporary and short-term generation of ROG, NOX, and PM$_{10}$ emissions from excavation, material handling, vegetation clearing, grading, cut-fill, concrete placement, asphalt paving, motor vehicle exhaust associated with construction equipment, construction employee commute trips, material transport (especially on unpaved surfaces), material handling and other construction activities associated with construction of the Phase 4b Project, including excavation and reclamation in the borrow areas listed in Table 2-23 and shown on Plate 2-6. Routes used for modeling haul truck trip emissions are shown on Plate 2-6. See Section 4.11.1.1, “Methodology,” above, for assumptions used in estimating the emissions that would be generated as a result of the Phase 4b Project and assumptions for borrow and hauling.

Improvements constructed within Sutter County would be regulated under FRAQMD jurisdiction; improvements constructed within Sacramento County would be regulated under SMAQMD jurisdiction. Impacts from activities proposed to occur in both counties have been analyzed based on the approximate distance (in linear feet) proposed to occur in each county.

Worst-case daily and annual construction emissions were calculated based on the assumptions described in Section 4.11.1.1, “Methodology,” above, for completion of the 2012–2016 construction seasons. Results of the peak daily and annual emissions are shown in Tables 4.11-2a, 4.11-2b, and 4.11-5.

Conservative assumptions were made for construction activities associated with all improvements that would occur under the Phase 4b Project. Construction activities associated with components of the Phase 3 and 4a
Projects could overlap proposed activities during construction of the Phase 4b Project. Therefore, emissions calculations summarized in Tables 4.11-2a and 4.11-2b represent worst-case daily emissions that could occur associated with construction of the Phase 4a Project (100% of Sacramento River east levee Reach B:13–15 and 100% of relocation of the Riverside Canal in 2012) and construction of 4b Project elements that would occur in 2012–2016. See Appendix F for detailed emission sources and assumptions. Based on the project information presented in Chapter 2, “Alternatives,” construction of the Adjacent Levee Alternative (Proposed Action) would result in maximum unmitigated daily emissions in excess of applicable FRAQMD thresholds for NOX and PM10 and SMAQMD thresholds for NOX. Because of the large size of the project, large construction area, and high intensity of construction activities to be conducted concurrently, as well as the existing nonattainment status of the project area, and based on the modeling conducted, it is foreseeable that unmitigated construction-generated emissions could result in or substantially contribute to a violation of air quality standards.

SMAQMD does not have an adopted mass emission-based threshold for PM10. Instead, SMAQMD relies on a concentration-based threshold equivalent to the ambient air quality standard for PM10. SMAQMD’s 2009 CEQA Guide requires proposed projects to quantify and discuss mass emissions and evaluate them based on the potential for exceedance above the national ambient air quality concentration based thresholds. For PM10 emissions, the SMAQMD’s CEQA Guide allows for enhanced PM10 Dust Control Practices to be proposed and implemented at the proposed project site for quantifiable emissions reductions. The Phase 4b Project has developed a comprehensive Fugitive Dust Control Plan in compliance with the guidelines that will effectively reduce mass PM10 emissions below the concentration based threshold.

If construction activities would result in or substantially contribute to a violation of the standard at or beyond the project boundary, then construction-generated emissions of PM10 would be significant. Because of the intensity of earthmoving activities that would be involved during the construction of the Sacramento River east levee and American River north levee improvements, the PGCC culvert remediation work, the West Drainage Canal remediation, and the PGCC/NEMDC South Levee raise work, it is likely that unmitigated emissions could substantially contribute to a violation of the applicable air quality standard.

As shown in Tables 4.11-2a and 4.11-2b, with implementation of the FRAQMD- and SMAQMD-recommended Fugitive Dust Control Plan(s), payment into off-site mitigation plans, and other proposed mitigation measures, the Adjacent Levee Alternative (Proposed Action) would result in temporary and short-term construction-related emissions that are less than significant for PM10 and PM2.5, and that are below the applicable mass emissions thresholds for NOX and ROG; therefore, the Adjacent Levee Alternative (Proposed Action) would not result in a direct, temporary or short-term adverse effect on air quality. This impact is considered significant.

Fix-in-Place Alternative

As with the Adjacent Levee Alternative (Proposed Action), worst-case daily and annual construction emissions that would occur under the Fix-in-Place Alternative would come primarily from earthmoving activities associated with the levee construction phase. Emissions associated with this alternative were calculated based on the difference in earth movement volumes and off-road construction equipment usage relative to the Adjacent Levee Alternative (Proposed Action). As for the Adjacent Levee Alternative (Proposed Action), modeling for this alternative was based on the scenario described above under “Methodology.” The difference in ROG, NOX, and PM10 emissions are modeled as a function of change in the number of construction equipment, haul trips and total amount of borrow material relative to the Adjacent Levee Alternative (Proposed Action).
### Summary of Maximum Daily Emissions within Sutter County During 2012–2016 for the Adjacent Levee Alternative (Proposed Action)

#### Table 4.11-2a

<table>
<thead>
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<tbody>
<tr>
<td>Pollutant</td>
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<td>NOx</td>
<td>PM10</td>
<td>C</td>
<td>EM</td>
<td>ROG</td>
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<td>PM10</td>
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<td>22.2</td>
<td>39.5</td>
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<tr>
<td>PGCC culvert remediation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>Riego Road Canal relocation</td>
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<td>Triangle Properties Borrow Site excavation and reclamation</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PGCC (Reaches E and H) waterside improvements</td>
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<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>NEMDC North (Reaches F–G) levee raising</td>
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<td>-</td>
<td>-</td>
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<td>549.7</td>
<td>5.8</td>
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<td>551.2</td>
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<td>-</td>
<td>No</td>
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<td>No</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes: Table entries in bold exceed thresholds.  
C = combustion sources (construction equipment); EM = earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; μg/m3 = micrograms per cubic meter; NEMDC = Natomas East Main Drainage Canal; NCC = Natomas Cross Canal; NOx = oxides of nitrogen; PM10 = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PGCC = Pleasant Grove Creek Canal; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

1 FRAQMD does not have an adopted mass emission-based threshold for PM2.5. Implementation of the District-recommended Fugitive Dust Control Plan and additional control measures are presumed to assure compliance with the applicable SIP attainment goals.

2 Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would reduce ROG, NOx, and PM10 emissions by approximately 5%, 20%, 75%–95% for fugitive PM10 emissions from earthmoving activities, and 45% for mobile-source PM10 emissions, respectively.

3 Coordination of an emissions reduction agreement with the FRAQMD for calculation and fee payment by the project proponent(s) to FRAQMD prior to project approval would be used to offset emissions in excess of FRAQMD’s significance thresholds for daily NOx emission resulting in a less-than-significant impact. See Appendix F for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010.
Table 4.11-2b
Summary of Maximum Daily Emissions within Sacramento County During 2012–2016
(Combined Portions of Phase 4a and 4b Projects) for the Adjacent Levee Alternative (Proposed Action)

| Year | Pollutant | ROG | NOx | PM10 | PM2.5 | ROG | NOx | PM10 | PM2.5 | ROG | NOx | PM10 | PM2.5 | ROG | NOx | PM10 | PM2.5 | ROG | NOx | PM10 | PM2.5 | ROG | NOx | PM10 | PM2.5 |
|------|-----------|-----|-----|-------|-------|-----|-----|-------|-------|-----|-----|-------|-------|-----|-----|-------|-------|-----|-----|-------|-------|-----|-----|-------|-------|-----|-----|-------|-------|
| 2012 | C         | 45.9| 272.7| 12.3  | 2,438.5| 11.3| 213.7|       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |
| 2013 | C         | 64.0| 377.9| 1.6   | 2,652.7| 1.5 | 55.9 |       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |
| 2014 | C         | 21.7| 80.4 | 4.4   | 1,428.1| 4.3 | 132.5|       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |
| 2015 | C         | 10.2| 80.4 | 4.4   | 1,428.1| 4.3 | 132.5|       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |
| 2016 | C         | 10.2| 80.4 | 4.4   | 1,428.1| 4.3 | 132.5|       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |     |      |       |       |

Phase 4a Project – Overlapping Components

Sacramento River east levee Reach A:13–15

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<thead>
<tr>
<th>Pollutant</th>
<th>ROG</th>
<th>NOx</th>
<th>PM10</th>
<th>PM2.5</th>
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<td></td>
<td>64.0</td>
<td>377.9</td>
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<td></td>
<td>11.3</td>
<td>213.7</td>
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Riverside Canal

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<th>NOx</th>
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<th>PM2.5</th>
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<td></td>
<td>21.7</td>
<td>80.4</td>
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<td></td>
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<td>132.5</td>
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Phase 4b Project – All Components

American River north levee Reach I:1–4

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<td>144.0</td>
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West Drainage Canal

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<th>PM10</th>
<th>PM2.5</th>
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Sacramento River east levee Reach A:16–20

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South Fisherman’s Lake Borrow Area and West Lakeside School Site excavation and reclamation

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<th>Pollutant</th>
<th>ROG</th>
<th>NOx</th>
<th>PM10</th>
<th>PM2.5</th>
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<td>3.6</td>
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RD 1000 Pumping Plant modifications

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<th>ROG</th>
<th>NOx</th>
<th>PM10</th>
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<tbody>
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<td>1.5</td>
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NEDMC South (Reaches E and H) levee raising

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<th>NOx</th>
<th>PM10</th>
<th>PM2.5</th>
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NEDMC South (Reaches E and H) waterline improvements

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<th>NOx</th>
<th>PM10</th>
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NEMDC North (Reaches F–G) levee raising

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Total unmitigated emissions (lb/day)

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<tr>
<td>2014</td>
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<tr>
<td>2016</td>
<td>81.9</td>
<td>85</td>
<td>Yes</td>
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</table>

Notes: Table entries in bold exceed thresholds. C = combustion sources; EM = earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; μg/m³ = micrograms per cubic meter; NEDMC = Natomas East Main Drainage Canal; NCC = Natomas Cross Canal; NOx = oxides of nitrogen; PM10 = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PGCC = Pleasant Grove Creek Canal; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

1 Earthmoving activities during Sacramento River east levee Reaches 13–15 include excavation of borrow sites and movement of levee fill material totaling approximately 1.3 million cubic yards.

2 Earthmoving activities during Riverside Canal relocation include excavation of borrow site material totaling approximately 410,000 cubic yards.

3 Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would reduce ROG, NOx, and PM10 emissions by approximately 5%, 20%, 75%–95% for fugitive PM10 emissions from earthmoving activities, and 45% for mobile-source PM10 emissions, respectively.

4 SMAQMD does not have an adopted mass emission-based threshold for PM10. However, in absence of a localized threshold, emissions are compared against concentration based Ambient Air Quality Standards (AAQS); PM10 24-hr standard = 50 μg/m³; SMAQMD’s CEQA Guide allows for enhanced PM10 Dust Control Practices to be proposed and implemented at the proposed project site for quantifiable emissions reductions. The proposed Phase 4b Project has developed a comprehensive Fugitive Dust Control Plan in compliance with the guidelines that will effectively reduce mass PM10 emissions below the concentration based thresholds.

5 Payment into SMAQMD’s Off-site Construction Mitigation Fee Program to offset NOx emissions in excess of SMAQMD’s significance threshold would reduce impacts for this pollutant in SMAQMD’s jurisdiction to a less-than-significant level.

See Appendix F for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction, etc.).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2009.
Total unmitigated worst-case emissions under the Fix-in-Place Alternative would be similar to those under the Adjacent Levee Alternative (Proposed Action). Table 4.11-3 presents maximum daily emissions for the Fix-in-Place Alternative during the peak (worst-case) construction year (2013). Emissions associated with the Fix-in-Place Alternative would not be anticipated to expose nearby existing sensitive receptors to substantial pollutant concentrations and/or substantially contribute to an air quality violation. The Fix-in-Place Alternative would have a direct, adverse impact on air quality. This impact is considered significant. (Similar)

<table>
<thead>
<tr>
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<tr>
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<td>(lb/day)</td>
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<td>Significant?</td>
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<tr>
<td>(lb/day)</td>
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Table 4.11-3: Maximum Daily Emissions during the Peak (2013) Construction Season within Sacramento County for the Fix-in-Place Alternative

**Notes:** Table entries in bold exceed thresholds. EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; μg/m³ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NOX = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM10 = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

Mitigation Measure 4.11-a: Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NOx, and PM10 During Construction

The project proponent(s) shall implement mitigation measures as recommended by FRAQMD or SMAQMD, as applicable, and shall comply with all applicable rules and regulations of FRAQMD or SMAQMD, as described below.

Construction in Sutter County (FRAQMD)

For portions of the project occurring in Sutter County, FRAQMD’s Draft Indirect Source Review Guidelines and online CEQA guidance provide mitigation measures for reducing temporary and short-term air quality impacts. As recommended by FRAQMD, the project proponent(s) shall ensure that the following mitigation measures are implemented during all
project construction activities to the extent practicable. In addition, construction of the proposed levee improvements are required to comply with all applicable FRAQMD rules and regulations, in particular Rule 3.0 (Visible Emissions), Rule 3.16 (Fugitive Dust Emissions), and Rule 3.15 (Architectural Coatings).

1. The project proponent(s) shall implement a Fugitive Dust Control Plan that includes the following measures:

   ► All earthmoving operations shall be suspended when winds exceed 20 miles per hour or when winds carry dust beyond the property line despite implementation of all feasible dust control measures.

   ► Construction sites shall be watered as directed by the Sutter County Department of Public Works or FRAQMD and as necessary to prevent fugitive dust violations.

   ► An operational water truck shall be on-site at all times. Apply water to control dust as needed to prevent visible emissions violations and off-site dust impacts.

   ► On-site dirt piles or other stockpiled particulate matter shall be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce wind blown dust emissions. Incorporate the use of approved nontoxic soil stabilizers to all inactive construction areas according to manufacturers’ specifications.

   ► All transfer processes involving a free fall of soil or other particulate matter shall be operated in such a manner as to minimize the free-fall distance and fugitive dust emissions.

   ► Apply approved chemical soil stabilizers to all inactive construction areas (previously graded areas that remain inactive for 96 hours), including unpaved roads and employee/equipment parking areas, according to the manufacturers’ specifications.

   ► To prevent track-out, wheel washers shall be installed where project vehicles and/or equipment exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed before each trip. Alternatively, a gravel bed or rumble strip may be installed as appropriate at vehicle/equipment site exit points to effectively remove soil buildup on tires and tracks to prevent/diminish track-out.

   ► Paved streets shall be swept frequently (at least once per day by water sweeper with reclaimed water recommended; wet broom) if soil material has been carried onto adjacent paved, public thoroughfares from the project site.

   ► Provide temporary traffic control as needed during all phases of construction to improve traffic flow, as deemed appropriate by the Sutter County Department of Public Works and/or Caltrans and to reduce vehicle dust emissions. An effective measure is to enforce vehicle traffic speeds at or below 15 miles per hour on unpaved roads.

   ► Reduce traffic speeds on all unpaved surfaces to 15 miles per hour, where feasible, and reduce unnecessary vehicle traffic by restricting access. Provide appropriate training, on-site enforcement, and signage. Where restricting vehicle speeds on unpaved surfaces to 15 miles per hour would make timely completion of the project infeasible, the project proponent(s) shall cooperate with FRAQMD to implement alternative dust control measures that would be at least as effective in reducing fugitive dust emissions. Such measures may include increased frequency in applying water to the
unpaved roads in the vicinity of sensitive receptors and reducing speeds in the vicinity of sensitive receptors.

- Reestablish ground cover on the construction site as soon as possible, through seeding and watering.
- Open burning is yet another source of fugitive gas and particulate emissions, and it shall be prohibited at the project site. No open burning of vegetative waste (natural plant growth wastes) or other legal or illegal burn materials (trash, demolition debris, etc.) may be conducted at the project site. Vegetative wastes should be chipped or delivered to waste to energy facilities (permitted biomass facilities), mulched, composted, or used for firewood. It is unlawful to haul waste materials off-site for disposal by open burning.

2. Construction equipment exhaust emissions shall not exceed FRAQMD Regulation III, Rule 3.0, Visible Emissions Limitations (40% opacity or Ringelmann 2.0). Operators of vehicles and equipment found to exceed opacity limits shall take action to repair the equipment within 72 hours or remove the equipment from service. Failure to comply may result in a notice of violation.

3. The project proponent(s) shall be responsible for ensuring that all construction equipment is properly tuned and maintained before and during on-site operation.

4. Minimize idling time to 10 minutes, to conserve fuel and minimize emissions.

5. Use existing power sources (e.g., power poles) or clean fuel generators rather than temporary diesel-powered generators.

6. Portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, may require ARB Portable Equipment Registration with the state or a local district permit. The owner/operator shall be responsible for arranging appropriate consultations with ARB or FRAQMD to determine registration and permitting requirements before equipment is operated at the site.

7. The project proponent(s) shall assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, and emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower [hp] and greater) that will be used an aggregate of 40 or more hours for the construction project and apply the following mitigation measure:

- Reduce NOX emissions from off-road diesel-powered equipment: The project proponent(s) shall provide a plan for approval by FRAQMD demonstrating that the heavy-duty (equal to or greater than 50 hp) off-road equipment to be used in the construction project, including owned, leased and subcontractor vehicles, shall achieve a project wide fleet-average 20% NOX reduction and 45% particulate reduction\(^1\) compared to the most recent ARB fleet average at time of construction.

Implementing the FRAQMD-recommended measures is expected to achieve at least a 75% reduction in fugitive dust emissions, 5% reduction in ROG emissions from

\(^1\) Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology (Carl Moyer Guidelines), and after-treatment products; voluntary off-site mitigation projects; providing funds for air district off-site mitigation projects; and/or other options as they become available. FRAQMD should be contacted to discuss alternative measures.
construction equipment, 20% reduction in NO\textsubscript{X} emissions from construction equipment, and 45% reduction in PM\textsubscript{10} emissions from construction equipment (SMAQMD 2004). The resulting maximum average daily construction-generated emissions in Sutter County, with mitigation incorporated, are conservatively calculated to be as high as 21 lb/day of ROG, 114 lb/day of NO\textsubscript{X}, 61 lbs/day of PM\textsubscript{10}, and 23 lb/day of PM\textsubscript{2.5} for the Phase 4b Project (differences between the Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative occur in Sacramento County).

The project proponent(s) shall implement the following measure to further mitigate NO\textsubscript{X} emissions through off-site reductions:

8. The project proponent(s) shall enter into a voluntary emissions reduction agreement with the FRAQMD to mitigate the portion of construction-generated emissions of NO\textsubscript{X} that exceeds the FRAQMD CEQA thresholds established in the 2010 Draft Indirect Source Review Guidelines, as presented in Section 4.11.1.2. Prior to the occurrence of any construction-related activities within areas under the jurisdiction of the FRAQMD, the project proponent(s) will provide to the FRAQMD detailed equipment inventories which will be used to calculate the NO\textsubscript{X} emissions offset fee. Predicted emissions estimates presented in the EIS/EIR represent worst-case emissions and would not be used to calculate the offset fee. The applicable fee rate shall be determined and the total fee shall be calculated based on the fee rate in effect at the time that subsequent environmental documents are prepared. The fee for subsequent construction projects shall be remitted to the FRAQMD.

Implementation of the mitigation measures described above would reduce project-generated construction-related emissions of ROG, NO\textsubscript{X}, and PM\textsubscript{10} below the FRAQMD-recommended thresholds of 25 lb/day for ROG and NO\textsubscript{X}, and 80 lb/day for PM\textsubscript{10}. This impact is considered less than significant. (Similar)

**Construction in Sacramento County (SMAQMD)**

For portions of the project occurring in Sacramento County, SMAQMD’s Guide to Air Quality Assessment in Sacramento County (SMAQMD 2004) provides mitigation measures for reducing temporary and short-term air quality impacts. As recommended by SMAQMD, the project proponent(s) shall ensure that the following mitigation measures are implemented during all project construction activities to the extent practicable and feasible.

- The project proponent(s) shall prepare a construction emissions dust control plan(s) in accordance with SMAQMD recommendations that reduces fugitive dust emissions by at least 85% (or shall provide calculations based on SMAQMD-approved methodologies showing that emissions would be reduced to less than 100 tons per year assuming a conservative reduction of 75% with typical mitigation). All grading operations shall be suspended when fugitive dust levels exceed levels specified by SMAQMD rules. The project proponent(s) and primary construction contractors shall ensure that dust is not causing a nuisance beyond the property line of the construction site.

- If overlapping construction phases in Sacramento County create unmitigated PM\textsubscript{10} emissions in excess of 400 TPY the project proponent(s) shall use advanced dust suppressant materials (such as EnviroTac II) on all unpaved roadways and stockpiled materials to ensure 95% or greater control of fugitive dust and a reduction of PM\textsubscript{10} emissions below 100 TPY.
The project proponent(s) shall develop a plan, in consultation with SMAQMD, demonstrating that the heavy-duty (>50 hp), off-road vehicles to be used in the construction project (including owned, leased, and subcontractor vehicles) shall achieve a project-wide fleet-average 20% NOX reduction and 45% particulate reduction compared to the most recent ARB fleet average at the time of construction.²

A comprehensive inventory of all off-road construction equipment equal to or greater than 50 hp that will be used for an aggregate of 40 or more hours during any portion of project construction shall be submitted to SMAQMD. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction operations occur. At least 48 hours before heavy-duty off-road equipment is used, the project proponent(s) shall provide SMAQMD with the anticipated construction timeline, including the start date, and the name and phone number of the contractor’s project manager and on-site foreman.

Emissions from off-road, diesel-powered equipment used on the project site shall not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) shall be repaired immediately, and SMAQMD shall be notified of noncompliant equipment within 48 hours of identification. A visual survey of all in-operation equipment shall be made at least weekly. A monthly summary of visual survey results shall be submitted to SMAQMD throughout the construction period, except that the monthly summary shall not be required for any 30-day period in which no construction operations occur. The monthly summary shall include the quantity and type of vehicles surveyed, as well as the dates of each survey. SMAQMD and/or other officials may conduct periodic site inspections to determine compliance.

The project proponent(s) shall pay into SMAQMD’s off-site construction mitigation fund to further mitigate construction-generated emissions of NOX that exceed SMAQMD’s daily emission threshold of 85 lb/day, for the purpose of reducing impacts to a less-than-significant level. The total mitigation fee for project-related work conducted in Sacramento County during the 2012–2016 construction seasons will be quantified in coordination with SMAQMD using equipment inventories provided by the project proponent(s) prior to construction. Calculation of fees associated with the Phase 4b Project shall be conducted at the time of project approval. The applicable fee rate shall be determined and the total fee shall be calculated based on the fee rate in effect at the time of project approval. The fee shall be remitted to SMAQMD before groundbreaking.

Implementing the SMAQMD-recommended measures is expected to achieve at least a 75–95% reduction in fugitive dust emissions, 5% reduction in ROG emissions from construction equipment, 20% reduction in NOX emissions from construction equipment, and 45% reduction in PM₁₀ emissions from construction equipment (SMAQMD 2004). The resulting maximum average daily construction-generated emissions with mitigation incorporated are shown in Table 4.11-2.

Implementation of the measures described above would reduce project-generated construction-related emissions in Sacramento County to a less-than-significant level for PM₁₀, NOX, and ROG. (Similar)

² Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, particulate-matter traps, engine retrofit technology, after-treatment products, and/or such other options as become available.
All Project Construction

The project proponent(s) shall implement the following additional measures to reduce construction emissions of PM$_{10}$ comprising fugitive dust and mobile-exhaust and ozone precursors throughout the project area:

► Open burning of removed vegetation shall be prohibited. Vegetation material shall be chipped on-site or delivered to waste-to-energy facilities to the extent feasible.

► An operational water truck shall be on-site at all times. Water shall be applied to control dust as needed to prevent dust impacts off-site. Unpaved areas subject to vehicle traffic, including employee parking areas and equipment staging areas, shall be stabilized by being kept wet, treated with a chemical dust suppressant or soil binders, or covered.

► The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventive measures, and removed within 1 hour from adjacent streets such material anytime track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations. All visible roadway dust tracked out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. Wet sweeping or a HEPA filter equipped vacuum device shall be used for roadway dust removal.

► Low-sulfur fuel shall be used for stationary construction equipment.

► Existing power sources or clean fuel generators shall be used rather than temporary power generators to the extent feasible.

► Low-emission on-site stationary equipment shall be used.

► Vehicle speeds on unpaved roadways shall be limited to 15 miles per hour.

► Idling time for all heavy-duty equipment shall be limited to 5 minutes.

► Install ARB-certified Level 3 diesel particulate filters (DPF) on a minimum of 15% of the total number of off-road (non-street legal) diesel-powered construction equipment pieces with an engine size equal to or greater than 50 hp throughout the duration of the project. For fleets with six or fewer total applicable equipment pieces, a DPF shall be installed on a minimum of one engine. All DPFs shall be kept in working order and maintained in operable condition according to manufacturer’s specifications. At the time of writing, a list of ARB-certified Level 3 DPF can be found at http://www.arb.ca.gov/diesel/verdev/level3/level3.htm.

Responsibility: Project proponent(s)

Timing: Prior to construction for preparation of dust control plans, during construction for implementation of dust control measures and maintenance of equipment to required specifications.

Enforcement: FRAQMD for construction in Sutter County, SMAQMD for construction in Sacramento County.
Alternative. Offset mitigation fees would reduce NO\textsubscript{X} emissions to a less-than-significant level. Therefore, this impact would be less than significant. (Similar)

**Impact 4.11-b: General Conformity with the Applicable Air Quality Plan**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no construction emissions associated with such construction would result. There would be no impact. (Lesser)

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding, necessitating emergency procedures. Extensive construction required to repair infrastructure damages would result in ozone precursor emissions and PM\textsubscript{10}. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered to too speculative for meaningful consideration. (Currently Unknown)

**Adjacent Levee Alternative (Proposed Action)**

The General Conformity Rule, which addresses whether a project conforms to the State Implementation Plan (SIP) approved and promulgated under Section 110 of the Federal Clean Air Act (CAA), applies to Federal actions that would generate emissions of criteria air pollutant or precursor emissions in nonattainment or maintenance areas. The Phase 4b Project is located within the Sacramento Metropolitan Nonattainment Area, which includes Southern Sutter County and all of Sacramento County, and is currently designated as severe-15 nonattainment for the 8-hour NAAQS ozone standard. In addition, the Sacramento County portion of the Sacramento Valley Air Basin is designated as moderate nonattainment for the national PM\textsubscript{10} standard, while Sutter County is unclassified for PM\textsubscript{10}. General conformity requirements would apply to actions where the total project-generated direct or indirect emissions would be equal to or exceed the applicable emissions levels, known as the de minimis thresholds. If the de minimis thresholds are exceeded, a conformity determination would be required prior to project approval. The de minimis thresholds applicable to the Sacramento Metropolitan Nonattainment area are provided in Section 4.11.1.2, “Thresholds of Significance,” above.

As discussed above, ozone precursor emissions of ROG and NO\textsubscript{X} would occur associated primarily with construction equipment exhaust and asphalt paving. Fugitive PM\textsubscript{10} emissions are associated primarily with site preparation and earthmoving activities. Because general conformity is determined by calendar year, total emissions were calculated for 2012–2016 calendar years using worst-case assumptions, as presented in Tables 4.11-2a and 4.11-2b.

Annual construction-generated emissions that would occur during calendar years 2012–2016 under worst-case assumptions for air quality analysis are shown in Table 4.11-4. Conformity determinations are based on the applicable Air Quality Management Plan (AQMP) in place within the Sacramento Metropolitan Nonattainment area. Total annual emissions (in both Sutter and Sacramento Counties), with mitigation proposed under Mitigation Measure 4.11-a implemented, are presented in Table 4.11-4. With mitigation, worst-case maximum annual emissions are below the de minimis thresholds and therefore would conform with the applicable SIP regional attainment goals (See Appendix F for detailed emission sources and assumptions).
Finally, project operation (discussed under Impact 4.11-c, below) would result in minimal emissions of pollutants for which the region is in nonattainment. Construction of the Adjacent Levee Alternative (Proposed Action) is not anticipated to conflict with implementation of the SIP, and a conformity determination would not be required prior to project approval. For this reason, this impact is considered less than significant.

**Fix-in-Place Alternative**

According to current Federal standards, EPA’s General Conformity Rule requirements apply only for the Adjacent Levee Alternative (Proposed Action). However, for purposes of this analysis, the emissions of criteria air pollutant or precursor emissions under the Fix-in-Place Alternative were calculated and are shown in **Table 4.11-5**. Conformity applicability is determined based on the established de minimus thresholds, developed to support regional attainment goals established in current AQMPs and SIPs. Total worst-case emissions for the Fix-in-Place Alternative, with mitigation proposed under Mitigation Measure 4.11-a, are presented in **Table 4.11-5**. As described above, emissions from the Fix-in-Place would be similar to the Adjacent Levee Alternative (Proposed Action), resulting in lesser emissions due to less total material required for proposed activities. Because the emissions under this alternative would fall below the Federal de minimis threshold, implementation of the Fix-in-Place Alternative would not conflict with implementation of the SIP, and therefore if selected in place of the Adjacent Levee Alternative (Proposed Action), a conformity determination would not be required. Therefore, this impact is considered less than significant. (Similar)

**Mitigation Measure: No mitigation is required.**

**Impact 4.11-c: Long-Term Changes in Emissions of ROG, NOx, and PM10 Associated with Project Implementation**

**No-Action Alternative**

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no long-term changes in emissions related to the project would occur. There would be no impact. (Lesser)

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Efforts to reconstruct the levee would depend on the extent and location of damage. Equipment such as pumping plants would likely be used, generating temporary and short-term emissions of air quality pollutants. Upon completion of levee repairs, generation of these emissions would not be substantially greater than in a no-action, no-flood scenario. However, a precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)
### Table 4.11-4
Summary of Maximum Annual Emissions During the 2012–2016 Construction Seasons
(Combined Portions of Phase 4a and 4b Projects) for the Adjacent Levee Alternative (Proposed Action)

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<td>1.3 8.4</td>
<td>0.5 48.3 0.5 5.5</td>
<td>4.1 29.8 1.6 105.2 1.5 11.9</td>
<td>3.5 25.9 1.5 102.8 1.3 11.8</td>
<td>3.7 25.1 1.2 28.1 1.2 3.3</td>
</tr>
<tr>
<td>Annual Unmitigated Emissions Total</td>
<td>5.2 31.1</td>
<td>1.4 342.2 1.3 37.0</td>
<td>4.1 29.8 1.6 105.2 1.5 12.0</td>
<td>3.5 25.9 1.5 102.8 1.3 11.9</td>
<td>3.7 25.2 1.2 28.1 1.1 3.2</td>
</tr>
<tr>
<td>Annual Mitigated Emissions Total</td>
<td>5.0 24.8</td>
<td>0.8 51.3 0.7 5.5</td>
<td>0.9 15.8 0.8 1.8</td>
<td>0.8 15.4 0.7 1.8</td>
<td>0.7 4.2 0.6 0.5</td>
</tr>
<tr>
<td>General Conformity Threshold</td>
<td>25</td>
<td>25</td>
<td>100</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Exceed de minimus Threshold?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes: Table entries in bold exceed thresholds. C = Emissions from combustion (from construction equipment); EM = PM emissions from earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; μg/m³ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NOX = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM10 = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

1 Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NOX, and PM10 emissions by approximately 5% for ROG, 20% for NOX, 75%–85% for fugitive PM10 emissions, and 45% for mobile-source PM10 emissions.

See Appendix F for assumptions and modeling results for each project activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010
### Table 4.11-5
Maximum Annual Emissions during the Peak (2013) Construction Season for the Fix-in-Place Alternative

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>ROG (tons/year)</th>
<th>NOx (tons/year)</th>
<th>PM10 Combustion</th>
<th>PM10 Earthmoving</th>
<th>PM2.5 Combustion</th>
<th>PM2.5 Earthmoving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total unmitigated emissions</td>
<td>4.2</td>
<td>31.8</td>
<td>1.7</td>
<td>79.2</td>
<td>1.5</td>
<td>9.2</td>
</tr>
<tr>
<td>SMAQMD Threshold</td>
<td>25</td>
<td>25</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significant?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total mitigated emissions</td>
<td>4.0</td>
<td>25</td>
<td>0.9</td>
<td>4.0</td>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>SMAQMD Threshold</td>
<td>80.6</td>
<td>26.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Table entries in bold exceed thresholds.

- **EPA** = Environmental Protection Agency; **FRAQMD** = Feather River Air Quality Management District; lb/day = pounds per day; μg/m³ = micrograms per cubic meter; **NCC** = Natomas Cross Canal; **NEMDC** = Natomas East Main Drainage Canal; **NOX** = oxides of nitrogen; **PGCC** = Pleasant Grove Creek Canal; **PM10** = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; **ROG** = reactive organic gases; **SMAQMD** = Sacramento Metropolitan Air Quality Management District

1. Peak daily emissions during the Fix-in-Place Alternative occur entirely within Sacramento County; no activities would occur in Sutter County during the 2013 construction season.

2. Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NOX, and PM10 emissions by approximately 5% for ROG, 20% for NOX, 75%–85% for fugitive PM10 emissions, and 45% for mobile-source PM10 emissions.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction.).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

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### Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Long-term project operation would not result in increased regional emissions of ROG, NOX, and PM10 from mobile-, stationary-, or area-source emissions. Project implementation would require a negligible increase in operational maintenance activities at the proposed facilities, and associated vehicle trips. In addition, the levee system would not require extensive landscape maintenance or other activities that would result in a substantial net increase in emissions in comparison with the No-Action Alternative or existing conditions.

Furthermore, project implementation would not result in the operation of any new major stationary emission sources. Modifications to RD 1000 pumping plants and City of Sacramento sump pumps would require replacement of some motors; however, these motors operate on electricity. Modifications may also include the addition of diesel-powered backup generators, but these additions would be minor stationary sources of emissions. The diesel-powered backup generators would be used in emergency situations and would be tested monthly. Stationary equipment such as diesel-powered generators would be subject to the applicable air district’s permitting process and Best Available Control Technology (BACT) and offset requirements. The applicable air district’s permitting process would ensure that emissions from equipment are within acceptable limits. Emissions of ozone precursors and PM10 associated with pump station operation would be negligible. No other stationary sources of emissions would be associated with the action alternatives. Thus, long-term operational emissions of criteria air pollutants or precursors would not result in or substantially contribute to a violation of the applicable air quality standards. Because project operation would not result in a direct, adverse impact on air quality, this impact is considered less than significant. *(Similar)*
Mitigation Measure: No mitigation is required.

Impact 4.11-d: Exposure of Sensitive Receptors to Toxic Air Emissions

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no potential exists for direct exposure of sensitive receptors to project-related toxic air emissions. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. In the event of a flood, toxic air emissions could be associated with the use of equipment during cleanup operations. However, effects on sensitive receptors would depend on many factors (e.g., magnitude and duration of emissions, proximity to sensitive receptors), and therefore the magnitude of the impact cannot be predicted. For these reasons, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Project construction and operation would generate emissions of diesel PM, which is identified by ARB as a TAC. TAC emission sources are discussed separately below. Neither FRAQMD nor SMAQMD have any current guidance on TAC emissions from mobile equipment, and neither has a threshold of significance for exposure to emissions from this equipment.

Project construction would result in the temporary and short-term generation of diesel exhaust emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities, in addition to diesel-fueled on-road haul trucks used for hauling borrow material. The dose to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). According to the Office of Environmental Health Hazard Assessment and California Air Pollution Control Officer’s Association (CAPCOA) Guidelines, health risk assessments (HRAs) that determine the exposure of sensitive receptors to TAC emissions should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (CAPCOA 2009).

The duration of mobilized equipment used near sensitive receptors located along the levee system and borrow sites would be short (less than 24 months for the cumulative Phase 4b Project). Each construction season would last approximately 6 months. In addition, as improvements are completed, mobile equipment would progress along the levees and canal alignments and would not operate near (within approximately 500 feet) any one sensitive receptor for more than a maximum of a few weeks. Sensitive receptors located near (within 500 feet of) the borrow areas would likely experience longer exposure periods than receptors located along the levee alignments but would be located a greater distance from most of the borrow activities (see Plates 2-6, 2-7a, 2-7b, 2-9, 2-11, 2-13, 2-14, 2-16, and 2-17 for a depiction of Phase 4b Project construction areas). The project would represent less than 0.1% of the 70-year exposure period for any nearby sensitive receptor in the area. Because the exposure period for receptors in the vicinity of the project would be minimal, and because the local air districts do not have guidance for preparation of HRAs for construction equipment, an HRA is not recommended for construction activities associated with the action alternatives.
As discussed under Impact 4.11-c, above, the RD 1000 pumping plants and City of Sacramento sump pumps to be modified as part of the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative would be minor stationary sources of TAC emissions in Sacramento Counties. Diesel-powered backup generators would be used in emergency situations and would be tested monthly. Consequently, diesel PM emissions associated with the modified pump stations would be infrequent. Furthermore, this category of stationary source (i.e., portable equipment), in addition to any other stationary sources that may emit TACs (i.e., dry cleaners), would be subject to FRAQMD and SMAQMD permitting and toxic best available control technology (T-BACT) requirements. If the implementation of T-BACT would not reduce emissions to an acceptable level, then FRAQMD and SMAQMD would deny the required permit for the stationary source (in this case, the diesel-powered backup generators). Therefore, operation of these stationary sources would expose sensitive receptors to substantial concentrations of TACs. No other stationary sources of emissions would be associated with any of the action alternatives. Thus, this impact is considered to be less than significant. (Similar)

Mitigation Measure: No mitigation is required.

4.11.3 Residual Significant Impacts

In the event of a levee failure under the No-Action Alternative, impacts due to temporary and short-term construction emissions, lack of general conformity with the Air Quality Plan, long-term emissions, and exposure of sensitive receptors to toxic air emissions are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.
4.12 NOISE

4.12.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.12.1.1 METHODOLOGY

Construction-related and stationary-source noise impacts were calculated based on the Federal Transit Noise and Vibration Impact Assessment methodology (Federal Transit Administration [FTA] 2006). Reference emission noise levels and usage factors were based on the Federal Highway Administration (FHWA) Roadway Construction Noise Model. The FHWA Roadway Noise Prediction Model (FHWA-RD-77-108) was used to calculate traffic noise levels along haul routes, based on estimates described in Chapter 2, “Alternatives.”

4.12.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to noise if they would do any of the following:

► result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

► expose people residing or working in the project area to excessive noise levels;

► expose persons to or generate excessive groundborne vibration or groundborne noise levels;

► for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or

► for a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

The following considerations apply to the first three significance thresholds:

► **Temporary and short-term construction noise impacts:** Temporary and short-term construction noise impacts are considered significant if construction-generated noise levels exceed the applicable standards at nearby noise-sensitive land uses.

► **Noise impacts from haul truck traffic:** For all affected residential land uses, noise that would be generated by haul truck traffic is considered significant if it would cause the overall exterior noise level to exceed the “normally acceptable” exterior land use compatibility noise standard of 60 A-weighted decibels (dBA) L_{dn}/CNEL (day-night average noise level/community noise equivalent level) for residential land uses or would exceed the interior noise standard of 45 dBA L_{dn}/CNEL in any inhabitable residence.

► **Exposure of sensitive receptors to, or generation of, excessive vibration levels:** Short- and long-term vibration impacts would be significant if project construction or operation would result in the exposure of sensitive receptors to, or would generate, vibration levels that exceed Caltrans’ recommended standard of 0.2 inch per second (in/sec) peak particle velocity (PPV) with respect to the prevention of structural damage for normal buildings (Caltrans 2002), or FTA’s maximum acceptable vibration standard of 80 vibration
decibels (VdB) with respect to human response for residential uses (i.e., annoyance) (FTA 2006) at any nearby existing sensitive land uses.

Portions of the Phase 4b Project activities would be located inside the Airport Land Use Compatibility Plan (ALUCP) area. Construction of proposed improvements to the West Drainage Canal would occur in the Airport’s 60 dBA L_{dn} noise contour, and the canal is located over one nautical mile south of the nearest runway. The project would not result in locating new receptors or workers that would reside or work in the area for an extended period of time. Therefore, this impact is not discussed further in the EIS/EIR.

4.12.2 IMPACTS AND MITIGATION MEASURES

Impact 4.12-a: Generation of Temporary and Short-Term Construction Noise

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities associated with the Phase 4b Project would occur; therefore, no potential exists for the Phase 4b Project to generate temporary and short-term construction noise. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Noise-sensitive land uses (in this case, primarily residential uses) are scattered throughout the area in which repair-related construction would occur. However, levee failure would likely result in evacuation of people (i.e., sensitive receptors) from damaged levee locations. Without sensitive receptors, potential impacts related to temporary and short-term construction noise would be less than significant. (Lesser)

Adjacent Levee Alternative (Proposed Action)

Construction of the Adjacent Levee Alternative (Proposed Action), as described in Section 2.3.3.2, would generate temporary, short-term, and intermittent noise at or near individual noise-sensitive locations in the Phase 4b Project area. However, construction of some of the proposed Phase 4b Project components, including excavation and grading at the South Fisherman’s Lake Borrow Area, the PGCC and NEMDC South bank protection, SR 99 NCC Bridge Remediation, West Drainage Canal realignment and bank improvements, relocation of the Vestal Drain ditch, conversion of the Brookfield borrow site to managed marsh, and improvements to the Chappell Drain and Ditch would not affect sensitive receptors because no noise-sensitive land uses are within 1,000 feet of construction activities and/or because topographic features (such as a levee) would shield sensitive receptors from noise sources. Construction noise impacts associated with these components would be less than significant.

Overview of Construction Activities and Equipment

Construction along levee and canal alignments would generally proceed in a linear manner, with the highest noise levels affecting individual residences and businesses for 2–3 weeks in most locations. Construction of the adjacent levee and associated cutoff walls, seepage berms, and relief wells would take place in Sacramento River east levee Reach A:16–20. A cutoff wall would be installed in the American River north levee east of Gateway Oaks Drive to Northgate Boulevard. Improvements to the west levee of NEMDC North (raising, widening, and installing cutoff walls) would occur from just south of Elkhorn Boulevard to Sankey Road. The PGCC west levee would be raised and widened. Culverts located beneath the PGCC would be upgraded or removed, and detention
basins would be constructed in the Triangle Properties Borrow Area, as needed. Irrigation canals and ditches would be relocated to either make room for expanded levee sections or to reduce underseepage potential. Discharge pipes for RD 1000 pumping plants and City of Sacramento sump pumps would be raised to cross the levee above the designed water surface profile. Parcels in the South Fisherman’s Lake and Triangle Properties Borrow Areas and at the West Lakeside School Site would be excavated and reclaimed as agricultural land. Noise levels in the vicinity of noise-sensitive land uses (e.g., residences and businesses) would fluctuate depending on the physical location of construction activities and on the particular type, number, and duration of use of various pieces of construction equipment. On-site equipment required for construction activities would include excavators, backhoes, bulldozers, scrapers, rollers, graders, loaders, compactors, and various trucks. Drilling augers and associated support equipment would also be needed for replacement of wells required by levee expansion. Individual equipment maximum noise levels produced by these operations could range from 79 to 90 dBA without the implementation of feasible noise control at a distance of 50 feet from the nearest noise source, as indicated in Table 4.12-1.

### Table 4.12-1

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Typical Noise Level (dB) at 50 feet</th>
<th>Equipment Type</th>
<th>Typical Noise Level (dB) at 50 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air compressor</td>
<td>78</td>
<td>Groundwater well drilling operations</td>
<td>77</td>
</tr>
<tr>
<td>Asphalt paver</td>
<td>77</td>
<td>Generator</td>
<td>81</td>
</tr>
<tr>
<td>Backhoe</td>
<td>78</td>
<td>Grader</td>
<td>85</td>
</tr>
<tr>
<td>Compactor</td>
<td>83</td>
<td>Hoe ram extension</td>
<td>90</td>
</tr>
<tr>
<td>Concrete breaker</td>
<td>82</td>
<td>Jack hammer</td>
<td>89</td>
</tr>
<tr>
<td>Concrete pump</td>
<td>81</td>
<td>Pneumatic tools</td>
<td>85</td>
</tr>
<tr>
<td>Concrete saw</td>
<td>90</td>
<td>Rock drill</td>
<td>81</td>
</tr>
<tr>
<td>Crane, mobile</td>
<td>81</td>
<td>Scraper</td>
<td>84</td>
</tr>
<tr>
<td>Dozer</td>
<td>82</td>
<td>Trucks</td>
<td>74–81</td>
</tr>
<tr>
<td>Front-end loader</td>
<td>79</td>
<td>Water pump</td>
<td>81</td>
</tr>
</tbody>
</table>

Notes: dBA = A-weighted decibels (dBA)

1 All equipment fitted with properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are the actual measured noise levels for each piece of heavy construction equipment.

2 Groundwater well drilling noise was measured by EDAW/AECOM (now AECOM) for the Phase 2 EIR 1st Addendum dated May 27, 2009.

Sources: Bolt, Beranek, and Newman 1981; FTA 2006; AECOM 2009

### Sensitive Receptors

Noise-sensitive land uses (i.e., residential) are scattered throughout the areas in which construction would occur. Waterside residences are located along the Sacramento River east levee, with the greatest concentration in Reach A:16–18B (see Plate 2-7a). Rural residences are located on the landside of the Sacramento River east levee in Reach A:16–18B (Plate 2-7a); some of these residences would be removed prior to construction of levee improvements. Rural residences are also located in the vicinity of proposed improvements to the west levees of the PGCC (Plate 2-13), NEMDC North (Plate 2-11), a 500-foot-long section of the west levee of the NEMDC south of Elkhorn Boulevard (Plate 2-14), and the Morrison Irrigation Canal. Residential subdivisions are located adjacent to the Sacramento River east levee Reach A:19A–20 (Plate 2-7b), American River north levee Reach I:1–4 (Plate 2-9), the West Lakeside School Site (Plate 2-17), and the South Fisherman’s Lake Borrow Area (Plate 2-7a). These sensitive receptors would be exposed to construction noise for several weeks to as long as
several months, depending on the extent to which schedules for the various construction activities listed above are staggered over the construction season.

**Predicted Noise Levels from Construction Activity**

Construction noise attributable to the Phase 4b Project was estimated using the FTA noise methodology for the prediction of heavy equipment noise sources (FTA 2006). Table 4.12-2 shows the results for the various stages of construction activities associated with the proposed levee and canal improvements, based on the equipment requirements for construction shown in Chapter 2, “Alternatives,” and the distances to the 45-dBA and 50-dBA noise contours assuming no intervening barriers. Appendix G shows the complete listing of inputs and the methodology for predicting noise levels from construction.

<table>
<thead>
<tr>
<th>Action</th>
<th>Project Improvement Type</th>
<th>Resulting Noise Level in dBA $L_{eq}$ at 100 Feet</th>
<th>Distance to Noise Contour (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing and grubbing/stripping</td>
<td>Levee, Canal</td>
<td>77.6</td>
<td>2,386.3 4,243.5</td>
</tr>
<tr>
<td>Landside structures removal</td>
<td>Levee</td>
<td>76.6</td>
<td>2,074 3,688</td>
</tr>
<tr>
<td>Stability berm excavation</td>
<td>Levee</td>
<td>77.9</td>
<td>2,473 4,397</td>
</tr>
<tr>
<td>Adjacent levee construction</td>
<td>Levee</td>
<td>77.9</td>
<td>2,473 4,397</td>
</tr>
<tr>
<td>Cutoff wall construction</td>
<td>Levee</td>
<td>77.3</td>
<td>2,314 4,114</td>
</tr>
<tr>
<td>Groundwater well drilling operations²</td>
<td>Levee</td>
<td>70.8</td>
<td>1,035 1,815</td>
</tr>
<tr>
<td>Garden Highway reconstruction</td>
<td>Levee</td>
<td>76.1</td>
<td>2,019 3,591</td>
</tr>
<tr>
<td>Levee degrading</td>
<td>Canal</td>
<td>76.7</td>
<td>2,173 3,863</td>
</tr>
<tr>
<td>Pipeline removal</td>
<td>Canal</td>
<td>75.6</td>
<td>1,912 3,400</td>
</tr>
<tr>
<td>Cutoff wall construction</td>
<td>Canal</td>
<td>76.0</td>
<td>1,990 3,538</td>
</tr>
<tr>
<td>Levee crown reconstruction</td>
<td>Canal</td>
<td>75.1</td>
<td>1,806 3,211</td>
</tr>
<tr>
<td>Borrow site excavation</td>
<td>Canal</td>
<td>75.9</td>
<td>1,965 3,494</td>
</tr>
<tr>
<td>Site restoration, demobilization</td>
<td>Levee, Canal</td>
<td>75.9</td>
<td>1,970 3,504</td>
</tr>
</tbody>
</table>

Notes: dBA = A-weighted decibel; $L_{eq} =$ energy-equivalent noise level

1 Distances to noise contours do not take into account intervening topography or existing structure façades.

2 Groundwater well drilling noise was measured by EDAW/AECOM (now AECOM) for the Phase 2 EIR 1st Addendum dated May 27, 2009. The equation: $L_{eq}$ (equipment) = E.L. + $10 \log (U.F.) - 20 \log (D/50) - 10 \log (D/50)$

Source: FTA 2006; Data modeled for USACE and SAFCA by AECOM in 2009

As shown in Table 4.12-2, the predicted highest, unmitigated noise level associated with construction activities would be 77.9 dBA $L_{eq}$ at 100 feet from use of heavy equipment associated with the levee and canal improvements and modifications to pumping plants. In some work locations, construction noise would be temporary and short-term, and impacts would generally not result in annoyance. In other instances, the levee itself may serve as a sound barrier that provides some protection to sensitive land uses. For instance, residences on the waterside of the Sacramento River east levee would be shielded from the highest noise levels that would occur with construction activity at the landside toe.
24 Hours Per Day, 7 Days Per Week Construction

Assuming a standard exterior-to-interior attenuation rate of 25 dBA for typical residential buildings with doors and windows closed, noise generated by construction equipment could result in interior noise levels that exceed the interior noise standard of 45 dBA \( L_{dn}/CNEL \) for residential land uses established by the City of Sacramento, Sacramento County, and Sutter County. Although construction activity is expected to take place during daytime hours (between 6:00 a.m. and 10:00 p.m.), because of the need to complete levee improvements outside of the flood season and because of other environmental and engineering constraints on project schedule, as described in Chapter 2, “Alternatives,” it is possible that construction may need to be conducted 24 hours per day, 7 days per week (24/7) in rural areas; this construction schedule would not be implemented in urban areas. For example, installation of cutoff walls along the Sacramento River east levee Reach A:16–19A as far east as the I-80 overcrossing and along the west levee of NEMDC North would be conducted 24/7 during a 2- to 3-month portion of the 156-day construction season. In addition, replacement of groundwater wells in Sacramento River east levee Reach A:18B and along the west levee of NEMDC North would require 24-hour construction for up to 3 days. Therefore, noise may be generated by construction equipment operating near homes during the more noise-sensitive early morning and nighttime hours (i.e., during hours that are not exempted by the applicable local ordinances in the City and County of Sacramento) and could result in sleep disturbance at nearby residences. Cutoff wall construction from I-80 to Northgate Boulevard (Sacramento River east levee Reach A:19A–20 and American River north levee Reach I:1–4) would only be conducted during daytime hours (between 6:00 a.m. and 10:00 p.m.).

The standard for exterior night time noise levels established by Sacramento County and the City of Sacramento is 60 dBA \( L_{dn} \). Noise models indicate that noise levels from cutoff wall construction equipment (deep soil mixing equipment or long-stick excavators) would be at or below 60 dBA \( L_{dn} \) at a distance of 500 feet from the construction equipment. Based on this distance of 500 feet from construction equipment, in the worst case, residents in the vicinity of cutoff wall construction (Sacramento River east levee west of I-80 [Reach A:16–18B] and along the west levee of NEMDC North) could be affected by 24/7 construction for approximately 1 week as the cutoff wall is installed along the levee during the 2- to 3-month portion of the 156-day construction season.

The 500-foot-long distance is modeled based on the assumption that sensitive receptors are located in the line-of-sight from the noise source. Additional reductions in noise levels would come from natural sound barriers, such as existing levees or other structures, including dwellings. For example, cutoff walls along the Sacramento River east levee would be constructed on the landside of the levee (near the toe of the existing levee) at an elevation below the crown of the levee. Therefore, the existing levee would provide some shielding to residents on the waterside of the levee, reducing exterior noise levels at 500 feet by an additional 10–12 dB below the predicted level of 60 dBA \( L_{dn} \). This estimate is based on the assumption that cutoff wall construction equipment would generate noise at the level of 10 feet above ground surface, and the height of the existing levee is 25 feet above ground surface. Waterside residences would be out of the line-of-sight of this equipment.

Impact Summary

Because of their proximity to residences, construction activities associated with the proposed levee and canal improvements as well as borrow site excavation could result in temporary and short-term noise levels that exceed the applicable daytime and nighttime standards for non-transportation sources (Table 4.12-2), resulting in increased annoyance and/or sleep disruption to occupants of residential dwellings and other sensitive receptors. These temporary and short-term impacts would be significant.

Fix-in-Place Alternative

Noise generation under the Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action). However, in Sacramento River east levee Reach A:16–20, cutoff walls would be installed through the top of the existing levee (Garden Highway), rather than at the landside toe. Therefore, waterside...
residences would be exposed to the highest noise levels shown in Table 4.12-2 without the benefit of the shielding that would be provided by the levee itself. Residents on the landside of the levee would still be subject to noise from scrapers and graders used to flatten the levee slopes. As a result, this alternative would likely cause greater noise disturbance to residents along the construction areas than under the Adjacent Levee Alternative (Proposed Action). These temporary and short-term impacts would be significant. (Greater)


The project proponent(s) shall ensure that the following measures are implemented at each work site during project construction to avoid and minimize construction noise effects on sensitive receptors:

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

**All Project Construction**

- Equipment shall be used as far away as practical from noise-sensitive uses.

- All construction equipment shall be equipped with noise-reduction devices such as mufflers to minimize construction noise, and all internal combustion engines shall be equipped with exhaust and intake silencers in accordance with manufacturers’ specifications.

- Equipment that is quieter than standard equipment shall be used, including electrically powered equipment instead of internal combustion equipment where use of such equipment is a readily available substitute that accomplishes project tasks in the same manner as internal combustion equipment.

- Construction site and haul road speed limits shall be established and enforced.

- The use of bells, whistles, alarms, and horns shall be restricted to safety warning purposes only.

- Noise-reducing enclosures shall be used around stationary noise-generating equipment (e.g., compressors and generators).

- Fixed construction equipment (e.g., compressors and generators), construction staging and stockpiling areas, and construction vehicle routes shall be located at the most distant point feasible from noise-sensitive receptors.

- When noise sensitive uses are within close proximity and subject to prolonged construction noise, noise-attenuating buffers such as structures, truck trailers, or soil piles shall be located between noise generation sources and sensitive receptors.

- Before construction activity begins within 500 feet of one or more residences or businesses, SAFCA shall provide written notification to the potentially affected residents or business owners, identifying the type, duration, and frequency of construction activities. Notification materials shall also identify a mechanism for residents or business owners to register complaints with the appropriate jurisdiction if construction noise levels are overly intrusive. The distance of 500 feet is based on the 60-dBA contour of the loudest anticipated construction activity.

- If noise-generating activities are conducted within 100 feet of noise-sensitive receptors (the 70-dBA noise contour of construction noise), the primary contractor shall continuously measure and record noise levels generated as a result of the proposed work.
activities. Sound monitoring equipment shall be calibrated before taking measurements and shall have a resolution within 2 dBA. Monitoring shall take place at each activity operation adjacent to sensitive receptors. The recorded noise monitoring results shall be furnished weekly to the project proponent(s).

- The primary contractor shall prepare and implement a detailed noise control plan based on the proposed construction methods and using the recorded noise monitoring results described above to facilitate implementing specific noise-reduction measures. This plan shall identify specific measures to ensure compliance with the noise control measures specified above. The noise control plan shall be submitted to and approved by the project proponent(s) before any noise-generating construction activity begins.

24/7 Project Construction

In addition to the noise-reducing measures listed above, the project proponent(s) shall implement the following measures concerning 24/7 project construction in rural areas (24/7 construction would not occur in urban areas):

- When construction of cutoff walls takes place during nighttime hours (between 10:00 p.m. and 6:00 a.m.), the project proponent(s) shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that cutoff wall construction takes place within 500 feet of the residents requesting reimbursement.

- When construction of groundwater wells (including up to 2 weeks of continuous pump testing for each well) or modifications to pumping plants takes place during nighttime hours (between 10:00 p.m. and 6:00 a.m.), and the resulting noise levels exceed the applicable County noise standard (i.e., 45 dBA $L_{eq}$ and 65 dBA $L_{max}$ for Sutter County and 45 dBA $L_{50}$ and 65 dBA $L_{max}$ for Sacramento County), the project proponent(s) shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that construction of groundwater wells or modifications to pumping plants takes place within 500 feet of the residents requesting reimbursement.

Responsibility: Project proponent(s)

Timing: Avoid noise-sensitive land uses, select or modify equipment to reduce noise generation, use enclosures, and notify affected residences and businesses before the start of construction activities; observe speed limits and monitor noise during construction; and reimburse residences who relocate when nighttime construction is within 500 feet for relocation expenses

Implementing this mitigation measure would reduce the impact, but may not reduce noise levels at all times to a less-than-significant level because of the close proximity of noise-sensitive receptors to construction activities and the limited feasibility of mitigating construction noise to acceptable levels. Therefore, these temporary and short-term impacts would remain significant and unavoidable for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. (Similar)
Impact 4.12-b: Temporary and Short-Term Exposure of Sensitive Receptors to, or Temporary and Short-Term Generation of, Excessive Groundborne Vibration

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities would occur; therefore, no potential exists for the Phase 4b Project to directly expose sensitive receptors to or generation of excessive groundborne vibration. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Sensitive land uses (in this case, primarily residential uses) are scattered throughout the areas in which repair-related construction would occur. However, levee failure would likely result in evacuation of people (i.e., sensitive receptors) from damaged levee locations. Without sensitive receptors, potential impacts related to the generation of excessive groundborne vibration would be less than significant. (Lesser)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction activities for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative have the potential to result in varying degrees of temporary ground vibration, depending upon the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table 4.12-3 displays vibration levels for typical construction equipment.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>PPV at 25 feet (in/sec)</th>
<th>Approximate Lv at 25 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large bulldozer</td>
<td>0.089</td>
<td>87</td>
</tr>
<tr>
<td>Trucks</td>
<td>0.076</td>
<td>86</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>0.035</td>
<td>79</td>
</tr>
<tr>
<td>Small bulldozer</td>
<td>0.003</td>
<td>58</td>
</tr>
</tbody>
</table>

1 Where PPV is the peak particle velocity.
2 Where Lv is the velocity level in decibels and based on the root mean square velocity amplitude.

Source: FTA 2006

On-site construction equipment would include excavators, backhoes, bulldozers, scrapers, rollers, graders, loaders, compactors, and various trucks. The most intense generation of ground vibration would be associated with large bulldozers that generate levels of 0.089 in/sec PPV and 87 vibration decibels (VdB) at a distance of 25 feet. These levels would attenuate to 0.037 in/sec PPV or 79 VdB at a distance of 45 feet. Residences and commercial buildings in Sacramento River east levee Reach A:19A–20 and along the American River north levee Reach 1:1–4 are located within 45 feet of the maximum construction limit areas. Vibration generated by off-road construction equipment could exceed the FTA (80 VdB) standard for the potential of human annoyance at these receptors. It is not expected that sleep disturbance would occur because there would be no nighttime construction activities in these reaches. Ground vibration would also be generated by haul trucks operating on area haul routes. As shown
in Table 4.12-3, vibration levels generated by trucks could reach as high as 0.076 in/sec PPV or 86 VdB at a distance of 25 feet. At a distance of 50 feet, haul truck levels would attenuate to 0.027 in/sec PPV and 77 VdB. No residential buildings are located within 50 feet of Phase 4b Project haul routes, which are shown on Plate 2-6. Because levels of on-site construction equipment could exceed Caltrans’ and FTA’s standards from off-road construction equipment, these temporary and short-term impacts related to vibration from other construction equipment would be significant. (Greater)


Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall ensure that the following measures are implemented at each work site during project construction to avoid and minimize construction groundborne vibration effects on sensitive receptors:

► Equipment shall be used as far away as practical from vibration-sensitive uses.

► Designate a Preservation Director and post contact information in a conspicuous location near the project site, so that it is clearly visible to nearby receptors most likely to be disturbed. The coordinator shall manage complaints and concerns resulting from vibration-inducing activities. The severity of the vibration concern would be assessed by the director, and if necessary, evaluated by a qualified vibration control engineer.

► Before construction activity begins within 45 feet of one or more residences or businesses, written notification shall be provided to the potentially affected residents or business owners, identifying the type, duration, and frequency of construction activities. Notification materials shall also identify a mechanism for residents or business owners to register complaints with the appropriate jurisdiction if construction vibration levels are overly intrusive.

► Before construction activity begins within 45 feet of one or more residences or businesses, the pre-existing condition of all buildings within a 45-foot radius within the immediate vicinity of proposed construction activities shall be recorded in the form of a preconstruction survey. The preconstruction survey shall determine conditions that exist before construction begins for use in evaluating damage caused by construction activities. Fixtures and finishes within a 45-foot radius of construction activities susceptible to damage shall be documented (photographically and in writing) prior to construction. All damage shall be repaired back to its pre-existing condition following the completion of construction activities and post-construction surveys of affected residences or businesses.

► When it is determined that construction generated vibration exceeds the threshold of human annoyance at a sensitive receptor, the project proponent(s) shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that construction takes place within 45 feet of the residents requesting reimbursement.

► The primary contractor shall prepare and implement a detailed vibration control plan based on the proposed construction methods. This plan shall identify specific measures to ensure compliance with the vibration control measures specified above. The vibration control plan shall be submitted to and approved by the project proponent(s) before any vibration-generating construction activity begins.
Responsibility: Project proponent(s)

Timing: Avoid vibration-sensitive land uses, designate a Preservation Director, conduct preconstruction surveys of affected buildings, prepare vibration control plan, and notify affected residences and businesses before the start of construction activities; implement vibration control plan and make Preservation Director available for complaint management during construction; reimburse residences who relocate when vibration-producing construction activities are within 45 feet for expenses after construction

Implementing this mitigation measure would reduce the impact, but may not reduce vibration levels at all times to a less-than-significant level because of the close proximity of vibration-sensitive receptors to construction activities and the limited feasibility of mitigating construction noise to acceptable levels, especially during nighttime hours. Therefore, these temporary and short-term impacts would remain significant and unavoidable for both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. (Similar)

Impact 4.12-c: Temporary and Short-Term Exposure of Residents to Increased Traffic Noise Levels from Truck Hauling Associated With Borrow Activity

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no construction activities would occur; therefore, no potential exists for borrow hauling activity caused by the Phase 4b Project to directly increase traffic noise levels. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Repairs would result in a substantial increase in vehicle trips. It is unknown how a flood would affect roadways within the Natomas Basin, or if borrow material sites would be the same or in close proximity to those examined for the Phase 4b Project. Traffic noise levels, as a result of flooding in Natomas during a catastrophic flood, are unpredictable; therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Construction during all Phase 4b Project construction years would generate high volumes of haul truck trips for borrow activities on area roads, as shown on Plate 2-6 and described in Section 4.10, “Transportation and Circulation.” Associated traffic noise levels were estimated using the FHWA Federal Highway Traffic Noise Prediction Model (FHWA 1978) and are displayed in Table 4.12-4. These estimates are based on the amount of borrow material to be hauled, number of days of construction, and the hours per day in which hauling would occur.

As shown in Table 4.12-4, noise levels attributable to anticipated Phase 4b Project haul truck traffic would be approximately 66.4 dBA $L_{eq}$, 64.6 dBA $L_{eq}$, 59.1 dBA $L_{eq}$, 66.0 dBA $L_{eq}$, and 61.5 dBA $L_{eq}$ at a distance of 50 feet from the roadway centerline for material hauled to Sacramento River east levee Reaches A:16–19A, Reaches A:19B–20, American River north levee Reach I: 1-4, NEMDC North west levee Reaches F–G, and PGCC west levee Reach E, respectively. An off-road haul route located at the landside toe of the Sacramento River east levee
would be used in Reaches A:16–20 of the Sacramento River east levee. Off-road haul routes would also be used to transport soil borrow material from the West Lakeside School Site, the Triangle Properties Borrow Area, and the Krumenacher Borrow Site/Twin Rivers Unified School District Stockpile Site, as shown on Plate 2-6. Because of limited space along Sacramento River east levee Reach A:19B–20, the off-road haul route along the landside levee toe may not support two-way haul truck traffic. To support one direction of the round trip, Gateway Oaks Drive and West El Camino Road may be used as on-road haul routes in addition to the off-road landside haul route. Alternatively, a single lane of Garden Highway from approximately Marina Glen Way to as far east as Gateway Oaks Drive may be used by haul trucks that would either be arriving from or returning to borrow sites (Plate 2-6). Residents located along these roadways would be exposed to increased roadway traffic due to haul traffic.

### Table 4.12-4

<table>
<thead>
<tr>
<th>Phase 4b Project Area</th>
<th>Number of One-Way Trips Required per Hour</th>
<th>Resulting Noise Level (dBA L&lt;sub&gt;eq&lt;/sub&gt; 50 Feet from Haul Route Centerline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacramento River east levee Reach A:16–19A</td>
<td>108</td>
<td>66.4</td>
</tr>
<tr>
<td>Sacramento River east levee Reach A:19B–20</td>
<td>72</td>
<td>64.6</td>
</tr>
<tr>
<td>American River north levee Reach I:1–4</td>
<td>20</td>
<td>59.1</td>
</tr>
<tr>
<td>NEMDC North west levee (Reach F–G)</td>
<td>99</td>
<td>66.0</td>
</tr>
<tr>
<td>PGCC west levee (Reach E)</td>
<td>35</td>
<td>61.5</td>
</tr>
</tbody>
</table>

Notes: dBA = A-weighted decibels; L<sub>eq</sub> = energy-equivalent noise level

1 Traffic noise levels were modeled using the Federal Highway Traffic Noise Prediction Model (FHWA 1978). Calculated noise levels do not consider any shielding or reflection of noise by existing structures or terrain features or noise contribution from other sources. Estimates are based on the amount of borrow material to be hauled, number of days of construction, and the number of hauling hours per day as provided in Chapter 2, “Alternatives,” and assuming a speed of 35 mph. See modeling results in Appendix G for further detail.

Source: Data compiled by AECOM in 2009

Because most of the project area roadways currently serve a limited volume of traffic, it is assumed that the modeled noise levels represent substantial increases compared to existing traffic noise levels. Not only would the Adjacent Levee Alternative (Proposed Action) result in substantially more vehicle trips on the off-road haul route along the toe of Sacramento River east levee Reach A:16–20 near residences and along public roadways with residences, but the vehicles would be predominantly haul trucks, which generate considerably more noise than passenger vehicles. Predicted traffic noise levels along haul routes related to construction in Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4 would exceed local exterior noise standards at landside and waterside residential land uses located along designated haul routes (Plate 2-6). Specifically, residences located along the landside haul route (Sacramento River east levee Reach A:16–20), Garden Highway (Sacramento River east levee Reach 19B–20), Gateway Oaks Drive, San Juan Road, Truxel Road, Northgate Boulevard, El Centro Road, and Powerline Road would experience an increase in traffic noise levels due to hauling activities. The closest residences to haul truck traffic are located along the landside of Sacramento River east levee (Reach A:19B–20), which would be used to haul soil borrow material from the South Fisherman’s Lake Borrow Area and the West Lakeside School Site to the respective levee construction area east of I-80. Because some residences in Sacramento River east levee Reach A:19B–20 are located only 25 feet from the centerline of the proposed landside haul route, the occupants could experience haul truck traffic noise levels of up to 70.9 dBA.

Assuming a standard exterior-to-interior attenuation rate of 25 dBA for residential buildings with windows and doors closed, noise generated by haul trucks supplying material for the Sacramento River east levee improvements could result in maximum interior noise levels of 41.4 dBA L<sub>eq</sub>. The 24-hour average exterior noise level...
levels ($L_{dn}$) associated with daily haul truck trips, assuming all haul trucks would be operational during a 16-hour day, would be 41.6 dB $L_{dn}$. Based on these results, haul truck noise levels are not expected to result in an exceedance of the interior noise standard of 45 dBA $L_{dn}$/CNEL for residential land uses established by Sacramento County, and the City of Sacramento for transportation noise sources, although they would exceed local exterior noise standards at residential land uses, as noted above. In addition, although hauling activity is expected to take place during daytime hours, because of the need to complete levee improvements outside of the flood season and because of other environmental constraints on project schedule, it may be necessary to conduct some hauling activity during some noise-sensitive early morning and nighttime hours, potentially resulting in sleep disturbance at nearby residences. For both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, this impact would be potentially significant. (Similar)

Mitigation Measure 4.12-c: Implement Noise-Reduction Measures to Reduce the Impacts of Haul Truck Traffic Noise

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall ensure that the measures listed below are implemented at each work site during project construction to minimize construction traffic noise effects on sensitive receptors:

► All heavy trucks shall be equipped with noise-control (e.g., muffler) devices in accordance with manufacturers’ specifications.

► All haul trucks shall be inspected before use and a minimum of once per year to ensure proper maintenance and presence of noise-control devices (e.g., lubrication, nonleaking mufflers, and shrouding).

► Before haul truck trips are initiated during a construction season on roads within 145 feet of residences (the 60-dBA noise contour of haul truck traffic), written notification shall be provided to the potentially affected residents identifying the hours and frequency of haul truck trips. Notification materials shall also identify a mechanism for residents to register complaints with the appropriate jurisdiction if haul truck noise levels are overly intrusive or occur outside the exempt daytime hours for the applicable jurisdiction.

Responsibility: Project proponent(s) and construction contractors

Timing: Before the start of construction activities

Implementing these measures would reduce interior and exterior noise levels generated by haul truck traffic that passes noise-sensitive receptors. However, the mitigated noise levels may not meet the applicable standards for local exterior noises for residential land uses. Therefore, implementing this mitigation measure would partially reduce the temporary and short-term traffic noise impacts from hauling activities, but not to a less-than-significant level because there are no other feasible mitigation measures available to fully reduce this impact. Thus, these impacts would remain significant and unavoidable for both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. (Similar)

Impact 4.12-d: Long-Term Increases in Project-Generated Noise

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for long-term increases in Phase 4b Project-generated noise. There would be no impact. (Lesser)
Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. Efforts to reconstruct the levee would depend on the extent and location of damage. Equipment such as pumping plants would likely be used, generating short-term noise. Upon completion of levee repairs, noise generation would not be substantially greater than in a no-action, no-flood scenario. However, a precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Proposed modifications to the RD 1000 Pumping Plants Nos. 1A and 1B along the Sacramento River east levee and Nos. 6 and 8 along the NEMDC; and the City of Sacramento Sump Pumps 160 (Sacramento River east levee Reach A:19B), 58 (American River north levee), and 102 (NEMDC west levee at Gardenland Park), would include raising and replacing discharge pipes; and replacing and relocating pumps and motors to the landward side of the Sacramento River east levee, American River north levee, and NEMDC west levee to make room for levee widening. These pumping station modifications would involve the long-term operation of noise-generating stationary equipment at new locations. Such equipment could result in noise levels in the range of 78–88 dBA at 3–5 feet from the source depending on the exact type and size (EPA 1971).

Any pumps that would be replaced as part of the proposed modifications would be larger pumps than are currently operating at these stations to provide enough horsepower needed to pump water through the raised pipes. Enclosure buildings would be included to house the electrical, control, and monitoring equipment. The only increase in stationary and area source noise associated with the proposed pump station modifications would be from additional mechanical equipment, such as an emergency standby generator. The generator would be used only during emergency situations and during monthly testing. Operational noise levels associated with proposed pumping station improvements would be in compliance with applicable performance standards at nearby receptors. Therefore, this impact related to long-term operational noise is considered less than significant. (Similar)

Mitigation Measure: No mitigation is required.

Impact 4.12-e: Temporary and Short-Term Exposure of People Working in the Project Area to Excessive Airport Noise Levels

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, people would not be working in the project area and workers would not be exposed to excessive Airport noise levels. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of the NLIP must be implemented. If a flood were to occur, the location of workers reconstructing the levee would depend on the location of damage, therefore, there is no way to predict whether workers would be exposure to unacceptable noise levels. A precise determination of significance is not possible and cannot be made because
the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The proposed realignment of and bank improvements to the West Drainage Canal under both the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative could expose construction personnel to excessive Airport noise levels because this work would be located within the 65 dB $L_{dn}/CNEL$ Airport noise-level contours. The *Sacramento County General Plan* Land Use Compatibility for Airport Noise chart (Sacramento County 1993b:21–23) lists a variety of land uses and the acceptable Airport noise levels applicable for each land use. Construction areas are not specifically stated in this list; however, it is assumed to fall in the category of industrial and manufacturing, which allows an acceptable airport noise level of up to 85 dB $L_{dn}/CNEL$. Construction areas would only be exposed to noise levels of up to 75 dB $L_{dn}/CNEL$. Therefore, construction areas would not exceed the recommended land use compatibility for Airport noise for the Phase 4b Project under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative. These temporary and short-term impacts are considered **less than significant.** *(Similar)*

**Mitigation Measure: No mitigation is required.**

**4.12.3 Residual Significant Impacts**

No residual significant noise impacts would occur under the No-Action Alternative because there would be no noise impacts associated with the No Phase 4b Project Construction scenario, and impacts associated with the Potential Levee Failure scenario are too speculative for meaningful consideration; therefore, it is currently unknown what the residual impact would be. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, the adverse effects of both temporary and short-term exposure of sensitive receptors to construction noise and vibration and exposure of residents to increased traffic noise levels from hauling activity would be significant. Implementing Mitigation Measures 4.12-a through 4.12-c would reduce this impact, but not to a less-than-significant level, because the mitigation would not fully reduce exterior noise and vibration levels below established standards. Therefore, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would result in temporary and short-term significant and unavoidable impacts on noise-sensitive receptors (e.g., nearby residents).
4.13 RECREATION

4.13.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.13.1.1 METHODOLOGY

No recreational facilities exist along the PGCC, the NCC, or the interior drainage canals that are part of the Phase 4b Project and no institutionally recognized recreational activities or substantial recreational uses take place in or in the immediate vicinity of these areas. Therefore, the impact analysis is limited to Phase 4b Project areas where recreational facilities are located and/or recreational activities occur, which consist of the Sacramento River east levee, American River north levee, NEMDC, and associated borrow sites and construction staging areas where there are nearby recreational facilities.

4.13.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to recreation if they would do any of the following:

- increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated;
- include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment;
- substantially restrict or reduce the availability or quality of existing recreational opportunities in the project vicinity; or
- implement operational or construction-related activities related to the placement of project facilities that would cause a substantial long-term disruption of any institutionally recognized recreational activities.

The Phase 4b Project would not increase population in the project footprint, and thus would also not increase the use of existing recreational facilities such that substantial physical deterioration would occur. Therefore, the first significance threshold does not apply and is not discussed further in this EIS/EIR.

4.13.2 IMPACTS AND MITIGATION MEASURES

Impact 4.13-a: Effects Related to the Proposed Natomas Levee Class 1 Bike Trail Project

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to have an adverse physical effect on recreational facilities or recreational uses. There would be no impact. (Lesser)
Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Impacts to recreation and recreational facilities as a result of levee failure would be the same as described in Impacts 4.13-b and 4.13-c under the No-Action Alternative (Potential Levee Failure). Additionally, the proposed Natomas Basin Class I Bike Trail is not a flood damage reduction component and could be constructed separately from the NLIP. If a bike and recreational trail were to be constructed on or along the perimeter levees without the implementation of the NLIP levee improvements, that facility would be subject to damage in the event of levee failure. Because of the uncertainty of this scenario, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

A paved bicycle/pedestrian trail currently exists on the NEMDC west levee in the Ueda Parkway, between Sotnip Road and Garden Highway. A Class II bikeway (an on-street lane designated for the exclusive use of bicycles) is located on Garden Highway between Northgate Boulevard and Natomas Park Drive. The Garden Highway Bikeway becomes a Class I off-street facility at Natomas Park Drive and continues along portions of Garden Highway adjacent to the American River north levee and Sacramento River east levee to the Natomas Main Drainage Canal.

The Phase 4b Project includes a proposal to construct a regional Class I bicycle and pedestrian trail along the remainder of the Natomas Basin perimeter levees (Plates 2-19 and 2-20), either on top of the levee crown, adjacent to the levee, or a combination of both. It is referred to in this EIS/EIR as the proposed Natomas Levee Class I Bike Trail Project. In those locations where a Class I facility would not be feasible because of physical constraints, a Class II bicycle path would be constructed. The alignment of the trail in relation to the levees and roadway intersections would be determined through a separate engineering design process because it would be a separate project from the NLIP. Construction would take place at least one construction season after completion of the NLIP, and construction timing would depend on funding for design and construction. (See Section 2.3.4.5, “Natomas Levee Class 1 Bike Trail Project,” for additional details).

Before selecting the final alignment of the proposed Natomas Levee Class 1 Bike Trail, SacDOT, Sutter County, and the City of Sacramento would consult with other agencies having authority or responsibilities for activities taking place on or in the vicinity of the affected levees, including RD 1000, SCAS, and the FAA. Once an alignment is selected and before approving a design, SacDOT (in consultation with Sutter County and the City of Sacramento) would conduct a project-level environmental review (pursuant to CEQA) of the proposed Natomas Levee Class 1 Bike Trail. All mitigation measures identified would be implemented. It is anticipated that construction of the proposed Natomas Levee Class 1 Bike Trail would result in environmental impacts similar to but less than those impacts already identified as a result of construction of the Phase 4b Project’s levee improvements. Due to the uncertainty of the alignment, lack of detailed project information and anticipated impacts associated with construction, and the fact that neither USACE nor SAFCA would have control over the timing or implementation of required mitigation measures, it is not possible to reach a definitive impact conclusion in this EIS/EIR. Therefore, the proposed Natomas Levee Class 1 Bike Trail Project would likely result in temporary and short-term impacts that are considered significant and unavoidable. (Similar) In the long-term, the proposed Natomas Levee Class 1 Bike Trail Project would have a less than significant and beneficial impact on recreation.

If SacDOT, Sutter County, and the City of Sacramento cooperate in implementing the mitigation measures required for the Natomas Levee Class 1 Bike Trail Project, the impact would be classified as significant in the short term but eventually would be reduced to a less-than-significant level in the long term.

Mitigation Measure: No feasible mitigation is available at this time.
Impact 4.13-b: Permanent Disruption of Recreational Activities and Facilities

Table 4.13-1 summarizes potential temporary and permanent impacts of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative on public and private recreational facilities in and adjacent to the Phase 4b Project area.

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for this alternative to directly disturb recreational facilities. Conformance with USACE guidance regarding levee encroachments, however, could require removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee, American River north levee, and NEMDC west levee (see Impact 4.7-a, “Loss of Woodland Habitats”). Removal of woodlands on the waterside of the levees would have an adverse effect on recreational experiences of recreationalists at Sand Cove Park, Garden Highway Bikeway, Ueda Parkway, and the Sacramento River, including boaters, and fisherman and birdwatchers using the waterside of the levees. This would be a significant impact. (Greater)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Recreational facilities, including boat ramps, a golf course, nature preserves, bike trails, and neighborhood parks could face temporary closure as a result of flooding not only affecting recreational facilities, but their usage. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action)

The Adjacent Levee Alternative (Proposed Action) would result in temporary and permanent impacts to a number of public and private recreational facilities adjacent to the Sacramento River east levee, American River north levee, and NEMDC west levee. Construction of the adjacent levee and seepage berms, and the expansion of the O&M and utility corridors would encroach on City parks, nature preserves, a private golf course, and an off-street bikeway. Table 4.13-1 summarizes these impacts.

The encroachment onto Natomas Oaks Park (Sacramento River east levee Reach A:20) and the Bannon Creek Preserve (American River north levee Reach 1:2) would require removal of trees, some of which are Heritage oak trees (see Impact 4.7-a, “Loss of Woodland Habitats”). Tree removal within nature preserves would affect certain activities such as bird watching, because many birds are dependent on trees. The Adjacent Levee Alternative’s (Proposed Action’s) woodland compensation components would require replanting certain areas with native riparian and valley oak woodland to compensate for loss of native oak woodlands in the Phase 4b Project area (see Section 2.3.4.2, “Woodland Compensation”). This woodland replanting may compensate partially for loss of park land and park amenities provided by the existing oak groves and natural areas. However, in accordance with the Public Park Preservation Act of 1971 (see Section 3.13.1.2, “State”), parkland compensation would need to provide land with comparable characteristics and of substantially equal size located in an area that would allow for use of the substitute park land by generally the same persons who used the existing park land. It is uncertain as to whether the amount of woodland compensation area located within the community of South Natomas would be commensurate with the number of trees removed from public parkland under the Adjacent Levee Alternative (Proposed Action). Additionally, it is uncertain as to whether these areas would be accessible to the public.
<table>
<thead>
<tr>
<th>Facility (Owner/Operator)</th>
<th>Location</th>
<th>Park Amenities</th>
<th>Temporary and Short-term Impacts</th>
<th>Permanent Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bannon Creek Nature Preserve (City of Sacramento Department of Parks and Recreation)</td>
<td>American River north levee, landside of Reach I:2</td>
<td>5.8-acre nature preserve</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The portion of the park not acquired for American River north levee improvements would likely be closed to the public during construction.</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The O&amp;M and utility corridors would encroach onto the park by approximately 50 feet, causing a loss of trees and a reduction in park area.</td>
</tr>
<tr>
<td>Costa Park Site (Park Site SN2) (City of Sacramento Department of Parks and Recreation)</td>
<td>Sacramento River east levee, landside of Reach A:19A, Garden Highway and I-80</td>
<td>3.3-acre undeveloped, planned neighborhood-serving park</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The park site would be used as a construction staging area.</td>
<td>Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee, seepage berm, and O&amp;M and utility corridors would encroach approximately 290 feet onto the park site from the toe of the existing levee. The reduction in area could make future park development infeasible. Fix-in-Place Alternative: Construction of the levee, seepage berm, and O&amp;M corridor would encroach approximately 280 feet onto the park site from the toe of the existing levee. The reduction in area could make future park development infeasible.</td>
</tr>
<tr>
<td>Discovery Park and American River Parkway (Sacramento County)</td>
<td>American River north levee waterside Reaches I:1–4</td>
<td>Boat ramp (Discovery Park), picnic areas, hiking and multi-use trails; east of the I-5 Bridge there is an equestrian staging area, and an archery range</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Construction along the Sacramento River east levee in Reach A:20 and along the American River north levee Reaches I:1–4 would generate dust and noise. Access to the American River Parkway from Natomas Park Drive would be closed. Access to Discovery Park and to the American River Parkway via Richards Boulevard and Jibboom Street would remain open during construction. The area under the I-5 Bridge is not in a developed recreation area. Because of dense riparian vegetation, the construction area would not be visible from developed recreational areas located on either side of the I-5 Bridge within the Parkway. Repairs and upgrades to the American River north levee under the I-5 Bridge would be located near to a Nature Study Area, where Parkway users could be present. Construction noise and disturbance may disrupt these activities.</td>
<td>None</td>
</tr>
</tbody>
</table>
### Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

<table>
<thead>
<tr>
<th>Facility (Owner/Operator)</th>
<th>Location</th>
<th>Park Amenities</th>
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<th>Permanent Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egret Park</td>
<td>5145 Westlake Parkway, immediately east of the proposed West Lakeside School site and proposed borrow area</td>
<td>9.64-acre park site, with 4.65 acres of developed facilities including a 0.35-mile-long bicycle trail, multi-use turf area, and lake</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Both alternatives could potentially reduce public enjoyment of the park because of temporary dust and noise impacts from borrow activities at the proposed West Lakeside School site (located to the immediate west of the park).</td>
<td>None</td>
</tr>
<tr>
<td>Fisherman’s Lake Parkway and Open Space (City of Sacramento)</td>
<td>Landside Natomas Central Drive at Po River Way</td>
<td>1.7-mile bikeway and open space</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Both alternatives could potentially reduce public enjoyment of the park because of temporary noise impacts generated by borrow hauling activities on Del Paso Road, to the immediate north of the park.</td>
<td>None</td>
</tr>
<tr>
<td>Garden Highway Bikeway</td>
<td>Waterside of the American River north levee in Reaches I:1 and I:2 and on the waterside and landside of the Sacramento River east levee in Reach A:20</td>
<td>1.25-mile trail from Natomas Park Drive to Natomas Main Drainage Canal; the trail follows the Natomas Main Drainage Canal north from the Sacramento River east levee Reach A:20</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Portions of the Bikeway located on the levee crown on the south side of Garden Highway on the American River north levee Reach I:1–2 and Sacramento River east levee Reach A:20 would be temporarily affected upon completion of construction.</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: In Reach A:20 on the landside of the levee between Natomas Oaks Park and the NEMDC, the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative (O&amp;M corridor) would encroach on the Bikeway. Following construction of the Fix-in-Place Alternative, the Bikeway could be replaced in the O&amp;M corridor. Fix-in-Place Alternative: Removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee in Reach A:20 and American River north levee in Reach I:1–2 would diminish the quality of the recreational experience for users of the Bikeway in these areas.</td>
</tr>
<tr>
<td>Facility (Owner/Operator)</td>
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<td>Temporary and Short-term Impacts</td>
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<td>Gardenland Park</td>
<td>Adjacent to the west levee of NEMDC South and Ueda Parkway, the City of Sacramento Sump Pump No. 102 is situated on the east side of the park</td>
<td>6-acre park with picnic facilities, ball field, volleyball and basketball courts, play areas, and restroom</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Temporary construction impacts because of City of Sacramento Sump Pump 102 work. The park would likely be closed to the public for one construction season.</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Expansion or relocation of City of Sacramento Sump Pump 102 would potentially require permanent conversion of a portion of Gardenland Park.</td>
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<tr>
<td>Hansen Park</td>
<td>350 Kelton Way (east side of NEMDC, landside)</td>
<td>Nature area, bicycle trail, approximately 3.5 miles of equestrian trail in the area including Dry Creek, Robla Creek, wetlands, and oak woodlands</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Potential for temporary impacts due to proximity to erosion repair on the waterside of the west bank of the NEMDC and other waterside work.</td>
<td>None</td>
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<tr>
<td>Johnson Park</td>
<td>East side of NEMDC South, north of El Camino Avenue</td>
<td>26-acre softball field and parking</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: While there is potential for park users to be affected by temporary dust and noise from erosion repair work and construction at City of Sacramento Sump Pump 102 on the NEMDC west levee, the UPRR tracks located between the NEMDC and the park are a source of existing noise and the NEMDC east levee would shield the park from project construction. Therefore, temporary construction impacts are unlikely to affect park users’ recreational enjoyment of the park.</td>
<td>None</td>
</tr>
<tr>
<td>Facility (Owner/Operator)</td>
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<td>Temporary and Short-term Impacts</td>
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<tr>
<td>McClellan Docks (City of Sacramento</td>
<td>Sacramento River east levee Reach A:20 On the waterside of Garden Highway near the Natomas Main Drainage Canal</td>
<td>1.7-acre dock facility currently leased to the Drowning Accident Rescue Team (DART)</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Construction traffic delays on Garden Highway could delay emergency response to water-related accidents (see Impact 4.10-c, “Temporary Disruption of Emergency Service Response Times and Access”).</td>
<td>None</td>
</tr>
<tr>
<td>Department of Parks and Recreation</td>
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<tr>
<td>Natomas Oaks Park (City of Sacramento</td>
<td>Sacramento River east levee Reach A:20 landside; 2101 Gateway Oaks Drive (intersection of Garden Highway and Gateway Oaks Drive)</td>
<td>13.2-acre park with oak grove, interpretative center picnic area, parking area</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Under both alternatives, the portion of the park not acquired for levee improvements would be closed for one construction season. The park would potentially be used for a construction staging area.</td>
<td>Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee and O&amp;M and utility corridors would encroach onto the park by up to 70 feet from the toe of the existing levee, resulting in a loss of oak trees from the preserve area (see Section 4.7, “Biological Resources”). Fix-in-Place Alternative: Construction of the O&amp;M and utility corridors would encroach by up to 55 feet from the toe of the existing levee, resulting in a loss of oak trees from the preserve area (see Section 4.7, “Biological Resources”). Relief wells that may be located at the toe of the levee could also encroach onto park land.</td>
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<td>Department of Parks and Recreation</td>
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<tr>
<td>Niños Parkway (City of Sacramento</td>
<td>American River north levee (Reach I:4)</td>
<td>Linear parkway with soccer fields, volleyball courts, bikeway, picnic areas, and community garden</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Construction-related impacts of dust, noise, and public safety may require closure of the community garden for one construction season.</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The adjacent levee and O&amp;M and utility corridors would encroach onto the southern edge of the community garden. Impacts would include loss of vegetation adjacent to the levee and Garden Highway. Few, if any, garden plots would be permanently affected.</td>
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<tr>
<td>Department of Parks and Recreation</td>
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<tr>
<td>River View Marina (private-open to the</td>
<td>Sacramento River east levee Reach A:19 waterside</td>
<td>Marina, restaurant, and dock</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Waterside access to the marina would not be affected; however, landside access would be subject to construction traffic delays.</td>
<td>None</td>
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<td>public)</td>
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<tr>
<td>Facility (Owner/Operator)</td>
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<tr>
<td>Riverbank Marina</td>
<td>Sacramento River east levee Reach A:20 waterside</td>
<td>Marina, boat dock/landing, three restaurants, and 200 boatslips</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Waterside access to the marina would not be affected; however, landside access would be subject to construction traffic delays.</td>
<td>None</td>
</tr>
<tr>
<td>Riverview Park</td>
<td>501 Forestara Circle; near the intersection of El Centro and San Juan Roads</td>
<td>5.19-acre developed park with playground, 0.2-mile walking path, picnic area, and shade structure</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Both alternatives could potentially reduce public enjoyment of the park because of temporary dust and noise impacts from borrow activities at the South Fisherman’s Lake Borrow Area (located approximately 1,000 feet west of the site) and from borrow hauling trucks using nearby El Centro Road and San Juan Road.</td>
<td>None</td>
</tr>
<tr>
<td>Sand Cove Park</td>
<td>Waterside of the Sacramento River east levee Reach A:19A, at 2005 Garden Highway</td>
<td>10.3-acre park with boat dock/landing, paved walkways, trails, and picnic facilities</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Access would be made difficult by traffic delays during construction, and construction-generated noise and dust would reduce public enjoyment of the park. This park would potentially be closed during construction for safety reasons. Construction-related impacts could include park closure or limitations on access.</td>
<td>Adjacent Levee Alternative (Proposed Action): None; Fix-in-Place Alternative: Waterside vegetation would be removed, resulting in permanent impacts to the park and to the quality of the recreational experience for park visitors.</td>
</tr>
<tr>
<td>Shorebird Park</td>
<td>Sacramento River east levee Reach A:19B at Kittiwake Drive and Swainson’s Way on the landside of the levee</td>
<td>2 acre-developed park with play equipment, picnic area with shelter, turf, and volleyball court</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The park would be closed for one construction season under both alternatives and would potentially be used for a construction staging area.</td>
<td>Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee and O&amp;M and utility corridors would encroach onto park by 50 feet. The loss of area at this relatively small park would reduce its recreational value. Existing landscaping and walkways located on the southern edge of the park would need to be redesigned and replaced. The levee and O&amp;M and utility corridors would not preclude future use of the park for recreational uses.</td>
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</table>
Table 4.13-1
Impacts to Recreational Facilities and Park Lands In or Near the Phase 4b Project Area

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Swallows Nest Country Club</td>
<td>Sacramento River east levee Reach A:19B, 2245 Orchard Lane on the landside of the levee</td>
<td>Private nine-hole golf course associated with a 53-acre adult community and country club</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: The golf course would be closed for one construction season under both alternatives.</td>
<td>Adjacent Levee Alternative (Proposed Action): Construction of the adjacent levee would encroach approximately 35 feet onto the course, and the O&amp;M and utility corridors would encroach another 30 feet onto the course, potentially requiring removal of two fairways and two golf holes located parallel to Garden Highway. Fix-in-Place Alternative: Construction of the O&amp;M and utility corridors would encroach approximately 30 feet onto the course. The encroachment on the two fairways and two golf holes located parallel to Garden Highway could make this portion of the golf course unusable, depending upon final design.</td>
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</table>

Fix-in-Place Alternative: Construction of the O&M and utility corridors under this alternative would not encroach as much as under the Adjacent Levee Alternative (Proposed Action); therefore, the park’s recreational value would not be substantially reduced. Existing landscaping and walkways located on the southern edge of the park would need to be redesigned and replaced.
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Ueda Parkway (City of Sacramento)</td>
<td>On the crown of the NEMDC west levee between Arden-Garden Connector and Elkhorn Boulevard, along Dry Creek, and Robla Creek east of the NEMDC</td>
<td>12.5 miles of paved recreation trails primarily on the levee crowns; connection to American River Parkway and downtown Sacramento; neighborhood access points at various locations</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Erosion repair, waterside repairs, and repairs at City of Sacramento Sump Pump 102 would require temporary closures of the bike trail on the NEMDC levee crown. The bike trail would be demolished at the construction locations and reconstructed.</td>
<td>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative: Vegetation removal (including potential removal of Heritage oak trees) on the waterside of the west levee of NEMDC south would adversely affect the recreational experiences for passive users (birdwatchers, fisherman, and hikers) of the Parkway.</td>
</tr>
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</table>

Note: I-5 = Interstate 5; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; RV = recreational vehicle

Sources: Data compiled by AECOM in 2009 from City of Sacramento Department of Parks and Recreation 2009a and 2009b
Construction of the adjacent levee would encroach approximately 35 feet onto the privately owned Swallow’s Nest Golf Course, and the O&M and utility corridors would encroach another 30 feet onto the course into an area that contains two golf holes and the associated fairways that parallel Garden Highway. The golf course is designed around the residences located in the 53-acre Swallow’s Nest Country Club and it is unlikely that the course could be redesigned to allow relocation of the two holes and fairways because of the limited area available. The Adjacent Levee Alternative (Proposed Action) would substantially affect the viability of the nine-hole golf course and, thus, would limit recreational opportunities for residents of the Swallow’s Nest Country Club and other golf course users.

The temporary closure of recreational facilities during construction, potential construction damage to recreational facilities, temporary diminishment of recreational experiences at nearby parks during construction, and permanent conversion of recreational facilities for construction of flood damage reduction facilities along with the loss of public and private park amenities would be a significant impact.

**Fix-in-Place Alternative**

The Fix-in-Place Alternative would result in temporary and permanent impacts to the same recreational facilities as would the Adjacent Levee Alternative (Proposed Action); however, the degree of impact would be somewhat reduced under this alternative because the footprint of this alternative, which would not include an adjacent levee, would be smaller and would not encroach as far onto adjacent properties as would the Adjacent Levee Alternative (Proposed Action) (Table 4.13-1). Under this alternative, however, the removal of riparian vegetation and woodlands on the waterside of the Sacramento River east levee, American River north levee, and NEMDC west levee would adversely affect recreational facilities and experiences in these areas, whereas this would not be the case under the Adjacent Levee Alternative (Proposed Action).

The temporary closure of recreational facilities during construction, potential construction damage to recreational facilities, temporary diminishment of recreational experiences at nearby parks during construction, and permanent conversion of recreational facilities for construction of flood damage reduction facilities along with the loss of public and private park amenities, and loss of recreational values on the waterside of the levees would be a significant impact. **(Greater)**

**Mitigation Measure 4.13-b: Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities**

<table>
<thead>
<tr>
<th>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative</th>
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<tr>
<td>The project proponent(s) shall provide compensation for loss of park land, park amenities, and park function, including, but not limited to, any loss of land at the undeveloped Costa Park site and replacement and/or relocation of the Garden Highway Bikeway, restoration of the Ueda Parkway Bike Trail, and restoration of parklands used for construction staging areas. The project proponent(s) shall consult with the City of Sacramento Department of Parks and Recreation to determine appropriate compensation. Compensation shall, at a minimum, replace parkland acreage at a 1:1 ratio, and shall provide for full restoration of park amenities such as Heritage oak trees, other landscaping, sports fields, bikeways, and related equipment and structures in accordance with the Public Parks Preservation Act of 1971.</td>
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</table>

The project proponent(s) shall compensate for loss of Heritage trees and native oak trees from within the City of Sacramento’s public parks and open space areas. Heritage trees shall be replaced in accordance with Sacramento City Code, Title 12, Streets, Sidewalks and Public Places, Chapter 12.64 Heritage Trees. California native trees shall be replaced with like species. Priority shall be given to replacement plantings within the Natomas Basin on public park land or open space/natural areas accessible to the public. Second priority would be replacement in public park areas of North Sacramento located within the City.
Responsibility: Project proponent(s)

Timing: Before the start of construction activities

Enforcement: City of Sacramento Department of Parks and Recreation

The owners of the private property upon which the Swallow’s Nest County Club is situated would be compensated according to Uniform Relocation Assistance and Real Property Acquisition Policies Act for the acquisition of the portion of the golf course needed for project implementation (see Section 3.3, “Land Use, Socioeconomics, Population and Housing”). However, because the course is situated around an existing residential development, it is uncertain that the course could be redesigned to allow relocation of the two holes and fairways. Therefore, project encroachment would potentially result in the golf course being down-sized or eliminated all together. No feasible mitigation measures are available to compensate for the loss of recreational opportunities provided by the golf course; therefore, both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would result in a significant and unavoidable impact. (Similar)

Implementing the above mitigation measure would reduce the project’s impacts to public recreational facilities because the City would be compensated for loss of public parkland, park amenities, and park function. However, a significant impact would remain because of the time lag for replacement trees to reach a comparable size to existing trees (up to several decades for some trees and approximately 100 years for Heritage oaks). Because there are no feasible mitigation measures to fully reduce these impacts to a less-than-significant level, this impact would be significant and unavoidable. (Similar)

The Fix-in-Place Alternative would also result in the permanent removal of waterside vegetation at Sand Cove Park and along the levees within the project area to comply with USACE levee vegetation guidance criteria. There are no feasible mitigation measures to fully reduce these impacts to a less than significant; therefore, impacts would remain significant and unavoidable. (Greater)

Impact 4.13-c: Temporary Changes in Recreational Opportunities during Project Construction Activities

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, the No-Action Alternative would not directly affect recreational opportunities in the project area. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Recreational facilities, bikeways, a private golf course, neighborhood parks, and nature preserves could face permanent closure as a result of flooding. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Table 4.13-1, above, summarizes the temporary construction-related impacts of the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative on public and private recreational facilities in and adjacent to the Phase 4b Project area.
As described in Section 3.13, “Affected Environment,” public and private recreational facilities are located in, adjacent to, or in close proximity of the Phase 4b Project area (see Plate 3-7). Those facilities located within and adjacent to the construction sites, including the Ueda Parkway Bike Trail, Shorebird Park, Costa Park Site, Natomas Oaks Preserve, Bannon Creek Preserve, and Ninos Parkway would be potentially temporarily encroached upon by construction activities. Some of these parks and park sites may also be used as construction staging areas and would be closed for one construction season, and until park repairs and restoration work is complete. For nearby recreational facilities, access may be restricted, and the quality of recreational opportunities could potentially be substantially reduced in the project vicinity as a result of noise, dust, traffic, and visual disturbance from construction and borrow activities. Recreationists visiting the Sacramento River and American River Parkways for passive recreational pursuits such as birdwatching or nature appreciation may experience disruption. Table 4.13-1 lists the parks that would be affected by the Phase 4b Project and the potential impacts that would occur as a result of project construction.

Because of closures of parks and other recreational facilities in the project area, recreationalists would need to use nearby recreational facilities in South Natomas and North Natomas, or in other adjacent areas such as Discovery Park and the American River Parkway during construction. Bicyclists that normally use the Ueda Parkway bike trail and Garden Highway Bikeway would have to find alternative on-street routes through the area during construction.

Overall, changes in recreational opportunities during project construction activities would be a temporary, but significant impact. (Similar)

Mitigation Measure 4.13-c(1): Prepare and Implement a Bicycle Detour Plan for All Bicycle Trails and On-Street Bicycle Routes, Provide Detours for Bicycle Facilities, and Coordinate with City and/or County Departments of Parks and Recreation to Repair of Damage to Recreational Facilities

The project proponent(s) shall implement the following measures to reduce temporary construction-related impacts on recreational opportunities in the project area:

► Before the start of construction, prepare a bicycle detour plan for all bicycle trails and on-street bicycle routes, including the Ueda Parkway Bicycle Trail and Garden Highway Bikeway, in consultation with the County and/or City of Sacramento Bicycle and Pedestrian Coordinator as applicable. The detour plan shall include posted signs clearly indicating closure points, detour routes, roadway markings to designate temporary bike lanes, and informational signs to notify motorists to share the roads with bicyclists. Signs shall be posted at major entry points for bicycle trails and routes to notify users of closure dates, points, and detours. The detour plan shall be in place before the start of construction and shall be maintained and implemented throughout the construction period.

► Upon completion of the levee improvements, coordinate with the City and/or County (where applicable) to restore access and repair or reconstruct any construction-related damage to recreational facilities, including the Ueda Parkway Bicycle Trail and Garden Highway Bikeway.

Responsibility: Project proponent(s)

Timing: Prepare bicycle detour plan before the start of construction activities; implement the plan during construction; and coordinate with the applicable City and/or County after construction of the levee improvements to restore access and repair any construction-related damage

Enforcement: Sutter County, Sacramento County, and/or City of Sacramento
Implementing this mitigation measure would reduce the temporary, construction-related impact to bicycle trails under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a **less-than-significant** level because construction-related damage would be repaired or reconstructed; access restored; and detour routes, roadway markings to designate temporary bike lanes, and informational signs would be provided. *(Similar)*

**Mitigation Measure 4.13-c(2): Provide Construction Period Information on Recreational Facility Closures and Detours and Provide Detours for Alternate Routes to Marinas**

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The project proponent(s) shall provide public information through the media and on the project proponent’s Web site regarding detours and alternative access routes to public and private recreational facilities affected by project construction. The project proponent(s) shall coordinate with the Sutter County, Sacramento County, and City of Sacramento Department of Parks and Recreation to make available information to the public regarding closure of public recreational facilities, detours, and alternate sites available.

- **Responsibility:** Project proponent(s)
- **Timing:** Before the start of, and during, construction activities
- **Enforcement:** Sutter County, Sacramento County, and City of Sacramento Department of Parks and Recreation

Implementing this mitigation measure would reduce the temporary impact from construction-related disruption of recreational opportunities under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative to a **less-than-significant** level. *(Similar)*

### 4.13.3 Residual Significant Impacts

Impacts related to the proposed Natomas Levee Class 1 Bike Trail Project in the event of levee failure are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration.

Due to the uncertainty of the alignment, lack of detailed project information and anticipated impacts associated with construction, and the fact that neither USACE nor SAFCA would have control over the timing or implementation of required mitigation measures, it is not possible to reach a definitive impact conclusion in this EIS/EIR. Therefore, impacts resulting from the proposed Natomas Levee Class 1 Bike Trail Project would remain significant and unavoidable in the short term. If SacDOT, Sutter County, and the City of Sacramento cooperate in implementing the mitigation measures required for the Natomas Levee Class 1 Bike Trail Project, the impact would be classified as significant in the short term but eventually would be reduced to a less-than-significant level in the long term. Additionally, there would be a beneficial impact on recreation with the addition of a new bike trail.

Impacts related to long-term disruption of recreational activities and facilities and temporary changes in recreational opportunities in the event of levee failure are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action), short- and long-term impacts associated with the time lag for replacement trees to reach similar sizes to existing trees (several decades for some trees and approximately
100 years for Heritage oaks) and the encroachment on private recreational facilities that could result in loss of the Swallow’s Nest Golf Course would remain significant and unavoidable.

The Fix-in-Place Alternative would result in a slightly lesser impact on adjacent recreational facilities on the landside of the levees, but would nevertheless result in the short- and long-term loss of park amenities and encroachment onto the Swallow’s Nest Golf Course, that would potentially make the course unusable. This alternative would also result in the permanent removal of waterside vegetation at Sand Cove Park to comply with USACE levee maintenance requirements. Short- and long-term impacts would remain significant and unavoidable.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, the potential permanent loss of public park amenities provided by Heritage oak trees and other mature trees located on public park land within the community of South Natomas would be a significant and unavoidable impact.
4.14 VISUAL RESOURCES

4.14.1 Methodology and Thresholds of Significance

4.14.1.1 Methodology

Evaluation of the project’s potential impacts on visual resources was based on a review of scenic vistas and landscapes that could be affected by project-related activities. Visual contrasts were examined, which included evaluations of changes in form, size, colors, project dominance, view blockage, and duration of impacts. Other elements such as natural screening by vegetation or landforms, placement of the Phase 4b Project components in relation to existing structures, and likely viewer groups were also considered.

4.14.1.2 Thresholds of Significance

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an impact in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to visual resources if they would do any of the following:

► have a substantial adverse effect on a scenic vista;

► substantially damage scenic resources, including but not limited to trees, rock outcrops, and historic buildings, within a state scenic highway;

► substantially degrade the existing visual character or quality of the site and its surroundings; or

► create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

There are no designated state scenic highways in the project area (Caltrans 2007); therefore, this issue is not discussed further in this EIS/EIR.

4.14.2 Impacts and Mitigation Measures

Impact 4.14-a: Alteration of Scenic Vistas, Scenic Resources, and Existing Visual Character of the Project Area

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, an adjacent setback levee would not be built that could obstruct views of the Natomas Basin from Garden Highway. However, to comply with USACE guidance regarding levee encroachments, trees and vegetation would be removed from the landside and waterside of Sacramento River east levee Reach A:16–20, the landside of American River north levee 1:1–4, a portion of NEMDC South to the Arden-Garden Connector, and the landside and waterside of NEMDC South between Arden-Garden Connector and the NEMDC Stormwater Pumping Station. Up to 6 acres of waterside vegetation could also be removed from the American River north levee in the event that a variance from USACE levee vegetation guidance is not granted. The quality of the views of the waterside of the levees would be degraded for recreational users of the rivers, residents along the waterside of the Sacramento River east levee, Garden Highway users, and others in the Natomas Basin that may be near a site where any large trees are removed. That is because the crowns of many trees, such as large cottonwood and oak trees, and Heritage oaks on
the waterside or landside of the levees, are clearly visible from most parts of the Natomas Basin. Therefore, this is considered a **potentially significant** impact. *(Greater)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Damage caused by flooding could result in damage to structures, vegetation, agricultural lands, and woodlands. Views available to residents and recreational users could lose aspects of visual coherence, vividness, and unity. However, if a levee failure were to occur, damage to visual resources would depend on extent and duration of a flood event and subsequent repair. In addition, if Garden Highway were destroyed by a flood event, access to views would no longer exist. However, if Garden Highway were to remain intact and usable, views within and surrounding the Natomas Basin would remain expansive and sweeping. Thus, while there could be substantial destruction to the existing visual character surrounding the Phase 4b Project area resulting from a catastrophic flood, if viewers are able to gain access to viewsheds, there would be no substantial degradation to the existing visual character. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration.** *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action)**

Existing views from Garden Highway follow a coherent line following trees, scattered residences, and agricultural lands into the Central Valley and beyond. These views are due to the elevation of Garden Highway, approximately 25 feet above the Natomas Basin in some areas. Under the Adjacent Levee Alternative (Proposed Action), a new levee would be constructed adjoining the existing Sacramento River east levee in Reach A:16–20. In these reaches, the existing levee already meets height requirements. Therefore, the top of the new levee would be no higher than the elevation of the existing levee crown, except in some locations where levee sections would be raised to accommodate raising of drainage discharge pipe crossings. In these select locations, the immediate view from Garden Highway would not be altered because Garden Highway would also be raised to accommodate the pipe crossings. However, from some residences on the waterside of Garden Highway would be slightly altered by these raises.

Although the construction of an adjacent levee would allow for some of the mature riparian tree corridor along the waterside of the Natomas Basin levees to be retained, a substantial amount of landside vegetation would be removed. The Adjacent Levee Alternative (Proposed Action) would require the removal of all vegetation on the landside of the levee, including several woodland groves and individual trees, plus removal of vegetation within 15 feet from the toe of the levee/seepage berm on the landside of the Sacramento River east levee Reach A:16–20 *(Plates 2-7a and 2-7b)* and along the American River north levee Reach I:1–4 *(Plate 2-9)*. Many of the existing trees tower above the surrounding features and are striking, distinctive elements in local settings along the levee system, visible to residents on both sides of the levee and travelers along Garden Highway and other local roadways, including I-5. As reminders of the oak woodlands that formerly occupied much of the region, these trees have a high aesthetic value. Engineering refinements in Sacramento River east levee Reach A:16–20 and American River north levee Reach I:1–4 may decrease the landside area that would be cleared of vegetation and may possibly reduce the number of trees that would need to be removed. Removal of riparian vegetation from the waterside of the Sacramento River east levee, however, would be visible to recreational users of the Sacramento River and residents on the waterside of the levee.

Tree removals would also take place along the landside of the west levee of the NEMDC North *(Plate 2-11)*. The trees in this location are generally associated with residences that would be removed or relocated to accommodate the proposed levee expansion. On the waterside of the west levee of NEMDC South, some vegetation removal would potentially be required to accommodate erosion repair on the waterside of the levee near Dry Creek and Arcade Creek. In addition, to comply with USACE levee vegetation guidance, trees would be cleared both on the
lands ide of the west levee of NEMDC South (within the existing maintenance corridor) and on the waterside of the west levee, including all larger native trees that are located in the upper one-third of the waterside slope, the crown, or within 15 feet of the landside toe (or within the right-of-way, if less than 15 feet) (Plate 2-14). This would result in substantial adverse changes to the scenic character along the Ueda Parkway, which provides paved trails and access to natural areas along the west levee of NEMDC South.

No waterside vegetation would be removed to construct improvements to the American River north levee. However, under a worst-case scenario in which a variance from USACE levee vegetation guidance is not granted, up to 6 acres of waterside woodlands would be cleared. Although this waterside vegetation clearance would not encroach into the American River Parkway (defined to include the American River and adjacent floodplain) and affect adjacent Parkway lands that are designated as “Protected Land,” in the American River Parkway Plan, the affected portion of the levee would be visible from within the Parkway and from adjacent roadways (Northgate Boulevard, Arden-Garden Connector). This would create a significant, long-term impact on visual resources in the American River Parkway.

The total extent of tree removal for the Adjacent Levee Alternative (Proposed Action) is described in Table 4.7-2 and in Impact 4.7-a, “Loss of Woodland Habitat.” As described in Section 2.3.4, “Habitat Improvements,” the Landside Improvements Project would preserve and create woodland groves in the Natomas Basin near the Sacramento River east levee and in other areas near the Natomas Basin. Table 4.7-3 shows the estimated long-term impacts of the Phase 4b Project on woodlands and total compensation included in all phases of the NLIP. Sites for woodland plantings would primarily be located on the landside of the Sacramento River east levee in Reach A:16 and along Lower Dry Creek east of the NEMDC.

In time, these new woodlands would enhance the visual qualities of the landscape; however, it would take several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed, which in some cases is likely 100 years old or older. The removal of the existing trees would substantially degrade the quality of scenic resources and the existing visual character and quality of local sites, including public parks, and their surroundings. These woodland impacts would be especially noticeable in public recreation areas and public natural open space areas where viewer sensitivity and concern are especially high. The Sacramento River east levee construction would remove oak trees from Natomas Oaks Park, and construction along the American River north levee would potentially remove trees from Bannon Creek Preserve. While the NLIP includes habitat compensation for loss of woodlands, the compensation would not be located within the public parks in the Natomas Basin. The loss of mature trees resulting from construction of the proposed levee improvements would contribute to a significant, long-term impact on visual resources in the Phase 4b Project area.

Levee modifications along the NEMDC North and the PGCC west levee, and work along the NCC including SR 99 bridge modifications and canal relocations, would not significantly alter the visual environment in these areas. These project features are not located in an area used for recreation or where viewer sensitivity is high. The levees are the dominant topographic features in these views, and the project would not result in a substantial change in the scenic character or quality of views in the area.

Habitat improvements associated with the West Drainage Canal relocation would include realignment of the western portion of the existing canal and bank improvements and the addition of a maintenance right-of-way on other parts of the existing canal (see Plate 2-17). In addition, the Brookfield borrow site would be converted to managed marsh and the adjacent Chappell Drain and Ditch would be improved. Because these improvements would take place at or below ground level, and would not substantially change the geometry of the canal, this component of the Phase 4b Project would have no long-term impact on visual quality. However, during construction, equipment would be visible to passersby and temporarily degrade scenic qualities.

Pump station modifications would also have the potential to alter visual resources in the Phase 4b Project area. The temporary construction activities and presence of construction equipment would substantially degrade the
visual character along the landside of the Sacramento River east levee, American River north levee, and the west levees of NEMDC South and NEMDC North. Upon completion of project construction, visual resource qualities and character would return to preexisting conditions in most cases; however, minor changes to adjacent areas may occur due to the modifications. Sump Pump 102 is located adjacent to the Gardenland Park, and any expansion or relocation of the pump station may result in adverse visual changes that would be noticeable to park users.

Implementation of the Natomas Levee Class 1 Bike Trail Project would not substantially alter visual resources in the project area. The paved trail would be constructed on or adjacent to the levees some time after the completion of the flood damage reduction facilities. Construction of the trail would not substantially alter the visual environment beyond the alterations that would occur with the construction of the adjacent levee, seepage berm, and other flood damage reduction facilities.

The proposed borrow operations would lower the elevation of borrow sites 2–6 feet over very large areas. The majority of the sites would be returned to pre-project conditions (e.g., field crops, fallow fields, rice, or grazing) (see Section 2.3.3.4 for details regarding borrow pit depth, area of excavation, and post-reclamation uses); the Brookfield Borrow Site would be converted to marsh habitat. The proposed elevation changes would not be discernible at the scale at which they would be implemented (hundreds of acres), and the proposed postconstruction land cover types would be consistent with adjacent land uses and overall land cover types in the surrounding portions of the Natomas Basin. Therefore, the long-term impacts of the borrow activities on visual resources would be less than significant. However, in the short term, the presence of construction equipment and the loss of vegetative cover would temporarily degrade the visual character of the borrow sites, resulting in a temporary and short-term significant impact.

While some may consider removal of vegetation as a means to decrease obstruction of views of the Central Valley, others may question the aesthetic value of a landscape consisting of agricultural land uses and whether these views are considered to be of high visual character or quality. Regardless of personal preference of what provides an aesthetically pleasing landscape, implementation of the Phase 4b Project would result in alterations to the existing visual character surrounding the Phase 4b Project area. Overall, because of the temporary presence of construction equipment and because of the permanent loss of mature trees on the landside of the levees in the Phase 4b Project area, including within public parks, the temporary and short-term, and long-term impacts to the existing and future visual character of the project area would be significant.

**Fix-in-Place Alternative**

As discussed above for the Adjacent Levee Alternative (Proposed Action), the existing levee already meets height requirements; therefore, the top of the new levee would be no higher than the elevation of the existing levee crown. Under the Fix-in-Place Alternative, the Sacramento River east levee Reach A:16–20 would be widened in place, but the resulting width of the levee next to Garden Highway would be less than under the Adjacent Levee Alternative (Proposed Action).

Under the Fix-in-Place Alternative, the Sacramento River east levee would be fixed in place, requiring removal of all riparian woodlands on the waterside of these levee reaches, in addition to the removal of all vegetation on the landside of the levee, plus an additional 15 feet from the toe of the levee/seepage berm to conform with USACE guidance regarding levee encroachments.

The total amount of tree loss that would result from the Fix-in-Place Alternative is described in Table 4.7-2 and in Impact 4.7-a, “Loss of Woodland Habitat.” Viewer sensitivity would be high for Sacramento River recreational users and for residents living on the waterside of the levee. This alternative would include offsetting the removal of trees with woodland planting; however, purchase of credits from a local mitigation bank would be necessary to fully offset the removal of trees from the waterside of the existing levee. Replacement of mature trees would take place beyond 15 feet of the landside levee toe, and these plantings would require several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed. Woodland compensation...
Mitigation Measure 4.14-a: Implement Mitigation Measures 4.7-a, “Minimize Effects on Woodland Habitat; Implement all Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions,” and 4.13-b, “Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities”

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement Mitigation Measure 4.7-a, “Minimize Effects on Woodland Habitat; Implement all Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 1602 of the California Fish and Game Code, and Section 2081 of the California Endangered Species Act Permit Conditions,” set forth in full in Section 4.7, “Biological Resources,” to reduce the project’s impacts to visual resources in the Natomas Basin. This mitigation measure includes identifying native woodland areas and minimizing disturbance of such areas to the extent feasible during construction; coordinating with the resource agencies to prepare a project-specific MMP and to append the programmatic LTMP to ensure the creation and long-term management of these components before construction commences; identifying waterside riparian woodland in the project footprint that provides SRA habitat functions and minimizing disturbance of such areas to the extent feasible during construction; replacing waterside riparian forest and scrub (canopy acreage) at ratios established by NMFS and monitoring progress with performance criteria; and entering into agreements with the appropriate local entity responsible for long-term management of created woodland habitats and long-term management of created SRA habitats, and ensuring all terms and conditions of these agreements are implemented.

The project proponent(s) shall implement Mitigation Measure 4.13-b, “Compensate City of Sacramento Department of Parks and Recreation for Loss of Parkland and Park Amenities,” set forth in full in Section 4.13, “Recreation,” to reduce the project’s impacts to visual resources in public parks and open space areas. This mitigation measure includes compensating for loss of park land, park amenities, and park function and replacing and/or relocating the Garden Highway Bikeway; consulting with the City of Sacramento Department of Parks and Recreation to determine appropriate compensation, which shall, at a minimum, include replacement of parkland acreage at a 1:1 ratio and restoration of park amenities such as Heritage oak trees, other landscaping, sports fields, bikeways, and related equipment and structures; and compensating for loss of Heritage trees and native oak trees from within the City of Sacramento’s public parks and open space areas.

Responsibility: Project proponent(s)

Timing: Implement Mitigation Measure 4.7-a before construction activities begin and implement Mitigation Measure 4.13-b immediately after construction activities are completed at each affected public park and open space area

Implementing these measures would reduce the impacts of visual resource degradation through replacement tree plantings, but not to a less-than-significant level because there are no feasible mitigation measures to fully reduce the magnitude of this impact because of the engineering requirements of the levee improvements and USACE vegetation removal requirements; therefore, this impact would remain significant and unavoidable. (Similar)
**Impact 4.14-b: New Sources of Light and Glare that Adversely Affect Views**

**No-Action Alternative**

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to change light and glare along the perimeter levee system. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Damage to the infrastructure in the Natomas Basin could result in a short-term decrease in nighttime lighting due to power outages. However, depending on the extent and location of levee failure and subsequent flood damage, emergency lighting could be required for nighttime security and construction. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered to be too speculative for meaningful consideration. *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

No new permanent sources of light or glare would be associated with the Adjacent Levee Alternative (Proposed Action) or the Fix-in-Place Alternative; however, equipment staging areas would be lit as necessary for security reasons during construction. Cutoff wall construction would be conducted 24/7, except in the urbanized area east of the I-80 overcrossing, where construction would be restricted to daytime hours. Some landslide areas may be screened from construction areas by trees, depending on tree height and proximity to the construction areas, and proximity of residences to the construction area. Where residences are present on the waterside of the levee, the existing levee itself, trees, and other vegetation could partially shield residences from lighting used on the landside of the levee, where the work would be performed. Security night lighting also would be provided at the modified pumping plants, although they would be situated such that no residences would be affected by this source of night light. Construction work would typically move in a linear fashion along the levees, and construction activities generally would not take place in any one location for more than a few weeks. Therefore, where nighttime construction lighting (if needed) would be clearly visible from nearby residences, the activity would be a temporary impact. This potential temporary impact would be periodic during some nighttime hours, last only several weeks, would not constitute a substantial source of light or glare, and is considered to be a temporary less-than-significant impact.

Construction of the cutoff walls west of the I-80 Bridge (Reach A:16–19A of the Sacramento River east levee) and along the west levee of NEMDC North may require substantially more nighttime construction and lighting than presented above, including construction activities potentially being conducted 24/7, in which case security and construction night lighting would be used continuously. Rural residences in these reaches would be exposed to continuous nighttime lighting as cutoff wall construction is advancing along the levee, creating a new source of substantial light or glare that would adversely affect nighttime views in the area. This would be a temporary but significant impact. *(Similar)*
Mitigation Measure 4.14-b: Direct Lighting Away from Adjacent Properties

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The project proponent(s) shall implement the following measures to reduce the impacts of light and glare associated with project construction activities:

- Require that nearby residents to construction activities be notified in advance of any nighttime construction activities.
- Require that construction and security lighting be shielded and directed downward to minimize the spill of light onto adjacent properties.

**Responsibility:** Project proponent(s)

**Timing:** Notify nearby residents before the start of nighttime construction activities, and require that lighting be shielded and directed downward during construction activities.

Implementing these measures would reduce the impacts of light and glare for nearby residents by shielding nighttime lighting downward away from residences, but not to a less-than-significant level. Therefore, this impact would remain significant and unavoidable because there are no feasible mitigation measures to fully reduce the magnitude of this temporary construction-related impact. *(Similar)*

### 4.14.3 Residual Significant Impacts

Impacts related to degradation of visual resources in the project area in the event of levee failure are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, adverse temporary impacts on visual resources due to construction activities and equipment on the levees would be significant. Mitigation Measure 4.14-b includes measures to screen residences from construction sites and equipment staging and storage areas that would reduce these impacts, but screening may not be feasible at all construction locations; therefore, the impact would remain significant and unavoidable. Similarly, for visual degradation due to light and glare, screening and directing lighting away from adjacent properties would reduce the impacts of light and glare for nearby residents, but not to a less-than-significant level; therefore, this impact would remain significant and unavoidable.

Under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative, adverse effects on scenic resources and visual character of the Sacramento River east levee, American River north levee, and NEMDC South resulting from the removal of a substantial number of trees, including large mature trees and Heritage oaks, from the landside and waterside of these levees, would be significant. The Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative include measures to limit the extent of impacts on visual resources caused by the short-term loss of woodland areas (e.g., temporary fencing installed during construction to prevent disturbance of native trees that are located adjacent to construction areas but can be avoided) and to offset them over the longer term (through substantial woodland planting). No feasible mitigation, however, is available to reduce the short-term impacts from Impact 4.14-a to a less-than-significant level; thus, this impact would remain significant and unavoidable in the short term.

For the Adjacent Levee Alternative (Proposed Action), with the new acres of woodland plantings that would be installed as described in Section 4.7, “Biological Resources,” the impact would be reduced over the long-term, but
not to a less-than-significant level. Because of the loss of visual resources and visual quality within highly sensitive public parks, this long-term impact would remain significant and unavoidable.

With the Fix-in-Place Alternative, mitigation measures would not be sufficient to fully mitigate impacts on woodland habitats as a result of the loss of waterside and landside vegetation. The long-term impact would remain significant and unavoidable under the Fix-in-Place Alternative, but would have a greater residual impact than would the Adjacent Levee Alternative (Proposed Action).
4.15 UTILITIES AND SERVICE SYSTEMS

4.15.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.15.1.1 METHODOLOGY

Impacts on utilities and service systems that would result from project implementation were identified by comparing existing service capacity and facilities against project implementation. Evaluation of potential utility and service systems impacts was based on a review of documents pertaining to the Natomas Basin. Additional information was obtained through consultation with appropriate agencies, such as Sacramento Regional County Sanitation District, Sacramento Municipal Utility District, Pacific Gas and Electric Company, and NCMWC.

4.15.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to utilities and service systems if they would do any of the following:

► exceed wastewater treatment requirements of the applicable regional water quality control board;

► require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

► exceed water supplies available to service the project from existing entitlements and resources, such that new or expanded entitlements would be needed;

► result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments;

► generate waste materials that would exceed the permitted capacity of local landfills or fail to comply with Federal, state, and local statutes and regulations related to solid waste; or

► result in substantial adverse physical impact associated with the provision of new or altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for public services such as fire protection, police protection, schools, or parks.

The Phase 4b Project would not involve any changes in land use that would increase short- or long-term demand for public services, including fire and police protection, schools, parks, and other public facilities, thus necessitating the construction of new or altered government service facilities. Similarly, the Phase 4b Project would not result in demand for increased natural gas facilities, electrical transmission lines, communication systems, water infrastructure, sewer lines, or solid-waste services beyond their current capacity. Therefore, thresholds related to increasing demands on existing public services and utilities do not apply to this analysis and are not addressed further in this EIS/EIR.
4.15.2 IMPACTS AND MITIGATION MEASURES

Impact 4.15-a: Potential Temporary Disruption of Irrigation Water Supply

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to cause construction-related disruption to irrigation water supply. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could cause flooding that would damage canals, potentially disrupting irrigation of cropland. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related effect on these services cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 2.3.3.3, “Irrigation and Drainage Components,” modifications to irrigation infrastructure would involve relocation or realignment of features located within the Phase 4b Project footprint. Irrigation and pipeline penetrations affecting the levee prism would be raised, as necessary, to meet current USACE and CVFPB regulations. Wells and pumps in the footprint of the proposed flood damage reduction facilities would be removed and replaced in locations farther from the project footprint. Relocated and realigned irrigation facilities would be replaced with in-kind structures compatible with the new levee footprint. The timing of these replacements would be planned, to the extent feasible, to prevent disruption of service (e.g., the Riego Road Canal would be functional before the existing canals are demolished).

Substantial temporary interruptions of irrigation supply could occur if irrigation infrastructure is damaged or otherwise rendered inoperable at a time when it is needed (e.g., reconnections to water supply sources are not completed by the time crop irrigation must begin). Given the extent and intensity of project construction activities, it is possible that these activities could impede the repair of damaged infrastructure or cause a delay in the provision of irrigation supply. This temporary impact is considered potentially significant. (Similar)

Mitigation Measure 4.15-a: Coordinate with Irrigation Water Supply Users Before and During All Irrigation Infrastructure Modifications and Implement Measures to Minimize Interruptions of Supply

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) and its primary contractors for engineering design and construction shall ensure that the measures listed below are implemented to minimize the potential for irrigation water supply interruptions during construction activities.

- Coordinate the timing of all modifications to irrigation supply infrastructure with the affected infrastructure owners and water supply users, either directly or through NCMWC.
► Include detailed scheduling of the phases of modifications/replacement of existing irrigation infrastructure components in project design and in construction plans and specifications.

► Plan and complete modifications of irrigation infrastructure for the nonirrigation season to the extent feasible.

► Provide for alternative water supply, if necessary, when modification/replacement of irrigation infrastructure must be conducted during a period when it would otherwise be in normal use by an irrigator.

► Ensure either that (1) users of irrigation water supply do not, as a result of physical interference associated with the project, experience a substantial interruption in irrigation supply when such supply is needed for normal, planned farming operations (i.e., a decrease in level of service in comparison with the existing level of service); or (2) users of irrigation water supply that experience a substantial decrease in an existing level of service that meets the established standards for the project area are compensated in kind for losses associated with the reduction in level of service.

Responsibility: Project proponent(s)

Timing: Before the start of construction activities

Implementing this mitigation measure would reduce the potential temporary impact of disruptions to irrigation supply to a less-than-significant level because the project proponent(s) would coordinate with water supply providers and consumers to minimize interruptions, would conduct work during the nonirrigation season whenever feasible, and would ensure that essential water supply necessary during the irrigation season is provided by an alternative supply if an interruption is unavoidable. (Similar)

Impact 4.15-b: Potential Disruption of Utility Service

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to disrupt utility service. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in minor to substantial flooding that could substantially interrupt utilities and public services, including natural gas facilities, electrical transmission lines, communication systems, water infrastructure, sewer lines, or solid-waste services. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related impact on these services cannot be predicted. Therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)
Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Implementation of the Phase 4b Project includes relocation of power lines and other utility infrastructure located within the project footprint, including the levee prism, in accordance with USACE and CVFPB guidance. To the extent feasible, mainline utility infrastructure, such as power poles, would be relocated beyond the landside levee toe (i.e., Sacramento River east levee Reaches A:16–19A); however, due to the high concentration of residential units near Sacramento River east levee Reaches A:19B–20, a utility corridor may be constructed on the waterside of the levee. Existing main electrical power transmission lines and poles on the waterside of the existing Garden Highway levee that do not need to be relocated or replaced to accommodate the project may be left in place. No new main electrical power transmission lines and poles would be installed on the waterside of Garden Highway in Sacramento River east levee Reaches A:16–18. Detailed project design would include consultation with all known service providers to identify specific infrastructure locations and appropriate protection measures. Consultation would continue during construction to ensure avoidance/protection of facilities as construction proceeds to minimize service disruptions. Where feasible, replacement utility structures would be completed before demolition of existing facilities.

Although steps would be taken to minimize potential impacts to utilities, project construction activities, including grading and excavation, could damage identified and unidentified utility equipment and facilities. In addition, required relocation of existing utilities could result in interruptions in service. Furthermore, the extent and intensity of project construction activities could affect service providers’ abilities to quickly repair damage and/or restore interrupted service. This temporary impact is considered potentially significant. (Similar)

Mitigation Measure 4.15-b: Verify Utility Locations, Coordinate with Utility Providers, Prepare and Implement a Response Plan, and Conduct Worker Training with Respect to Accidental Utility Damage

<table>
<thead>
<tr>
<th>Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative</th>
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<tbody>
<tr>
<td>Before construction begins, the project proponent(s) and its primary contractors shall coordinate with CVFPB and applicable utility providers to implement orderly relocation of utilities that need to be removed or relocated. If SAFCA is the project proponent instead of USACE, SAFCA shall coordinate with USACE, as well as CVFPB. Power pole relocations shall be coordinated with SMUD. Consistent with sound engineering practices that prioritize the following, individual service lines shall: (1) use existing configurations and facilities to the extent feasible, (2) place any new poles on the landside of Garden Highway to the extent feasible, subject to the approval of USACE (only if SAFCA is the project proponent), CVFPB, and any other pertinent regulatory public agency and utility company; and (3) if waterside poles are necessary on the Sacramento River east levee in Reaches A:19B–20, any such relocation of utilities would be subject to the approval of USACE (only if SAFCA is the project proponent), CVFPB, and any other pertinent regulatory public agency and utility company. The project proponent(s) and its primary contractors shall provide the following:</td>
</tr>
<tr>
<td>▶ Notification of any potential interruptions in service shall be provided to the appropriate agencies and affected landowners.</td>
</tr>
<tr>
<td>▶ Before the start of construction, utility locations shall be verified through field surveys and the use of the Underground Service Alert services. Any buried utility lines shall be clearly marked in the area of construction on the construction specifications in advance of any earthmoving activities.</td>
</tr>
<tr>
<td>▶ Before the start of construction, a response plan shall be prepared to address potential accidental damage to a utility line. The plan shall identify chain of command rules for notification of authorities and appropriate actions and responsibilities to ensure the safety of the public and workers. Worker education training in response to such situations shall</td>
</tr>
</tbody>
</table>
be conducted by the contractor. The response plan shall be implemented by the project proponent(s) and its contractors during construction activities.

- Utility relocations shall be staged to minimize interruptions in service.

**Responsibility:** Project proponent(s)  
**Timing:** Before the start of construction activities

Implementing this mitigation measure would reduce the impact from disruption of utility services to a less-than-significant level because the project proponent(s) and its primary contractors would coordinate with utility service providers and consumers to minimize interruptions to the maximum extent feasible, and a response plan to address service interruptions would be prepared and implemented. *(Similar)*

**Impact 4.15-c: Increases in Solid Waste Generation**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, there would be no increase in solid waste generation related to project implementation. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Cleanup operations following flooding would generate very high levels of solid waste; the amount of waste would depend on the extent, depth, and duration of flooding and the types of property damaged. Waste materials could exceed the permitted capacity of local landfills or fail to comply with Federal, state, and local statutes and regulations related to solid waste. A precise determination of significance is not possible and cannot be made because the extent of the magnitude of impact is unknown. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

There would be virtually no short- or long-term generation of solid waste associated with project operation. Temporary project construction activities would generate up to 100,000 cubic yards of solid waste during construction of the Phase 4b Project. Sources of solid waste related to construction activities would include cleared vegetation and structural debris from removal of agricultural structures and residences located within the project footprint. Waste materials resulting from degradation of existing levees would be hauled off-site and not used for construction. Other materials, such as asphalt, concrete, pipes, and gravel, would be removed from the footprint of the proposed flood damage reduction facilities.

Waste materials (including cleared vegetation) would be hauled off-site to a suitable disposal location. Excess earth materials (organic soils, roots, and grass from borrow sites and the adjacent levee foundation; and excavated materials that do not meet levee embankment criteria) would be used in the reclamation of borrow sites or hauled off-site to a suitable disposal location. Hazardous materials (e.g., building materials containing lead paint or asbestos) encountered during the removal of residences and other structures would be disposed of in accordance with regulatory standards (see Mitigation Measures 4.16-b[1] and 4.16-b[2] in Section 4.16, “Hazards and Hazardous Materials”). The location of the landfill used for disposal of spoil material and other construction-related waste would be determined by the construction contractor at the time of construction activity based on
capacity, type of waste, and other factors. Only those landfills determined to have the ability to accommodate the construction disposal needs of the alternatives would be used. It is likely that Kiefer Landfill, owned and operated by Sacramento County, would be used for all or a part of the construction waste. Kiefer Landfill, which accepts 10,815 tons per day (TPD) of solid waste, is located about 15 miles southeast of the city of Sacramento (approximately 16 miles southeast of the intersection of Northgate Boulevard and Garden Highway). With a permitted capacity of more than 117 million cubic yards through 2035 and a remaining capacity of nearly 113 million cubic yards as of 2005 (California Integrated Waste Management Board 2009), Kiefer Landfill would be able to accommodate the project’s construction disposal needs. Similarly, the Western Regional Landfill in Placer County, approximately 10 miles from the PGCC, would be able to accommodate the project disposal requirements. The Western Regional Landfill accepts 1,900 TPD, with a maximum permitted capacity of more than 36 million cy and a remaining capacity of more than 29 million cy (California Integrated Waste Management Board 2009). Project construction and operation would not cause existing regional landfill capacity to be exceeded; therefore, this impact is considered less than significant. (Similar)

Mitigation Measure: No mitigation is required.

4.15.3 RESIDUAL SIGNIFICANT IMPACTS

Impacts associated with disruption to irrigation supply and utility services, and increases in solid waste generation as a result of the No-Action Alternative, are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Mitigation measures described above for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would reduce the impacts of a potential temporary disruption of the irrigation supply and the provision of other utility services to less-than-significant levels; therefore, there would be no residual significant impacts.
4.16 HAZARDS AND HAZARDOUS MATERIALS

4.16.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.16.1.1 METHODOLOGY

This section addresses potential sources of hazards and risks associated with hazardous materials that may be associated with implementation of the Phase 4b Project. This analysis was based on a search of the California Department of Toxic Substances Control (DTSC’s) Envirotor database and SWRCB’s Geotracker database, and a review of Natomas Levee Improvement Program Initial Site Survey and Phase I Environmental Site Assessment, Volumes 8 and 13 (Kleinfelder 2009a).

Evaluation of the project’s potential impacts on Airport safety was based on a review of the regulations pertaining to the Phase 4b Project area, including the Airport’s WHMP (SCAS 2007), FAA’s Advisory Circular (AC) 150/5200-33B on hazardous wildlife attractants on or near airports (FAA 2007), and Part 77 of the Federal Aviation Regulations.

Potential sources of wildfire hazards and risks associated with implementation of the Phase 4b Project were also evaluated. This evaluation was based on a review of historic local weather conditions, historic ignition sources, topography, vegetation, and fire history. Fire hazard severity zones, which are established by the California Department of Forestry and Fire Protection, were identified and compared to the Phase 4b Project area.

4.16.1.2 THRESHOLDS OF SIGNIFICANCE

The thresholds of significance encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and intensity. The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines because CEQA is more stringent than NEPA. The Adjacent Levee Alternative (Proposed Action) or alternatives under consideration were determined to result in a significant impact related to hazards and hazardous materials if they would do any of the following:

► create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

► emit hazardous emissions or involve the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

► be located on a site that is included on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;

► impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;

► result in a safety hazard for people residing or working in a project area that is located within 2 miles of a public airport or public-use airport; or

► result in a significant impact related to wildfire hazards if they would expose people or structures to a significant risk of loss, injury, or death from wildland fires.
There are no established thresholds for wildlife strikes. For this analysis, airport safety was analyzed within the Airport Perimeter B and the Airport Operations Area. The FAA recommends a separation distance of 10,000 feet between the Airport Operations Area and hazardous wildlife attractants (FAA 2007); this area is identified as the Airport Perimeter B. Additionally, the FAA recommends a distance of 5 statute miles between the farthest edge of the Airport Operations Area and hazardous wildlife attractants (FAA 2007).

### 4.16.2 IMPACTS AND MITIGATION MEASURES

**Impact 4.16-a: Accidental Spills of Hazardous Materials**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction activities and thus no accidental spills of hazardous materials related to this project would occur. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could upset stored hazardous materials and spread agricultural pesticides, oil, gasoline, and other hazardous materials in flood waters, creating hazardous conditions for the public and the environment. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

Project-related construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels (gasoline and diesel), oils and lubricants, and cleaners (which could include solvents and corrosives in addition to soaps and detergents), that are commonly used in construction projects. Bentonite (a nonhazardous material) and/or cement would be used where cutoff walls are being constructed to remediate levee seepage conditions. Construction contractors would be required to use, store, and transport hazardous materials in compliance with Federal, state, and local regulations during project construction and operation. Risks to water quality associated with incidental releases of these materials on project sites are addressed in Section 4.6, “Water Quality.”

Compliance with the applicable regulations would reduce the potential for accidental release of hazardous materials during their transport and during project construction activities. Consequently, the risk of significant hazards associated with the transport, use, and disposal of these materials is low. This temporary impact is considered less than significant. *(Similar)*

**Mitigation Measure: No mitigation is required.*
Impact 4.16-b: Potential Land Use Constraints Due to Contamination within the Pumping Plant No. 8 Footprint and Potential Exposure of Construction Workers and the General Public to Contaminated Groundwater

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur, thus the project proponent(s) would not be required to consider land use constraints related to contamination within the footprint of Pumping Plant No. 8. Neither construction workers nor the general public would be potentially exposed to groundwater contamination. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. However, in the event of a catastrophic flood, the magnitude and location of a potential levee breach is not predictable and therefore a determination of significance is not possible. It is unknown if a flood event would affect agency-listed hazardous materials sites. This impact is considered to be too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As described in Section 3.16.2.1, “Database Search,” one Cortese-listed site is located within the construction footprint for Pumping Plant No. 8: the Olympian Oil site located at 4422 Northgate Boulevard (see Plate 2-14). Initial monitoring in 2005 indicated that groundwater had been contaminated with gasoline range organics, methanol, MTBE, tert-butyl alcohol, and toluene. The most recent quarterly sampling results available from June 21, 2009 indicate that two of the monitoring wells contain MTBE above the reporting limit. No other chemical constituents were reported (McCampbell Analytical 2009). Quarterly monitoring of groundwater was still required at the time of release of this DEIS/DEIR.

The property owner, Olympian Oil, is required to operate and maintain the monitoring wells and conduct other required remediation activities. As noted above, the proposed Pumping Plant No. 8 footprint overlaps with the Olympian Oil site boundary. Construction activities associated with Pumping Plant No. 8 would include raising and replacing the discharge pipes within the waterside bench. Excavation, dewatering, and ground-surface-level construction could destroy monitoring structures or impede access to monitoring equipment and potentially expose construction workers to contaminated groundwater. Therefore, this temporary impact is considered potentially significant. (Similar)

Mitigation Measure 4.16-b: Cooperate with Olympian Oil and Regulatory Agencies to Preserve, Modify, or Close Existing Groundwater Monitoring Wells at the Olympian Oil Site

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) that would implement modifications to Pumping Plant No. 8, which would be located within the Olympian Oil site boundary, shall submit copies of plans and specifications to Olympian Oil, Sacramento County, and the Central Valley RWQCB for coordination purposes. The project proponent(s) shall coordinate with Olympian Oil or any successor, Sacramento County, and the Central Valley RWQCB to establish and implement the preservation, modification, or closure of existing groundwater monitoring wells that will interfere with project implementation. Construction shall not proceed within the Olympian Oil site boundary or on lands used for groundwater monitoring and other remediation activities until Sacramento County and the Central Valley RWQCB have approved Olympian Oil’s or a successor’s plan for well preservation, modification, or closure. Preservation,
modification, and/or closure of monitoring wells would remain the responsibility of Olympian Oil or successor.

**Responsibility:** Project proponent(s)

**Timing:** Before the start of construction activities on Pumping Plant No. 8

Implementing this mitigation measure would reduce potentially significant land use constraints due to contamination on the Olympian Oil site which is listed on the Cortese List to a less-than-significant level under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative because remediation activities would continue as required by Sacramento County and the Central Valley RWQCB, and coordination with responsible parties would ensure that necessary measures would be taken to avoid damage to monitoring wells or expose construction workers and/or the general public to contaminated groundwater.

**Impact 4.16-c: Potential Exposure of Construction Workers and the General Public to Hazardous Materials Encountered at Project Sites**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to expose the general public and/or construction workers to hazardous materials encountered at project sites. The Natomas Basin is largely agricultural and this type of land use can often involve the application of pesticides, residues of which may remain in soils for years. Humans may be exposed to these potentially hazardous materials through direct contact with soil, groundwater leaching, or exposure to airborne dust created by typical agricultural crop management practices, such as discing. Plants and animals may be exposed to these potentially hazardous materials through contact with surface soils or through contact with stormwater or irrigation runoff that could carry the materials into ponds, drainages, and other waterways. Because of this risk, the continued presence of pesticide residues and the existing levels of arsenic in soil on land used for agricultural purposes are considered to be a potentially significant impact. *(Similar)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding known sites of hazardous materials, potentially exposing the public and the environment to both known hazardous conditions (discussed in Section 3.16, “Hazards and Hazardous Materials”) and potentially unknown hazardous conditions in areas that have not been evaluated under a Phase I and/or II Environmental Site Assessment (ESA). Underseepage and boils, resulting from high river stages, may force groundwater to the surface within or adjacent to areas containing pesticide residues or contaminated soils. This could transport sediments containing hazardous materials from agricultural fields into waterways. However, the potential for such an occurrence is uncertain, and the magnitude and duration of any related risks cannot be predicted. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. *(Currently Unknown)*

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

As described in Section 3.16, “Hazards and Hazardous Materials,” Phase I ESAs have been completed for a small portion of the Phase 4b Project footprint, and are limited to six parcels located along the PGCC west levee. The Phase I ESAs disclose the potential presence of potentially hazardous materials, including possible asbestos,
aboveground storage tanks (ASTs), oil and gas wells; PCBs in pole-mounted transformers, and pesticide-impacted soils from historic agricultural use (Kleinfelder 2009a). See Section 3.16, “Hazards and Hazardous Materials,” for the site-specific conditions at each Assessor’s Parcel Number (APN) included in the Phase I ESAs. The remainder of the Phase 4b Project footprint has not been evaluated for the potential presence of hazardous materials.

It is possible that former land uses, particularly agricultural use, may have resulted in a release of hazardous materials onto the Phase 4b Project site. In addition, as described in Section 3.16.2.3, “Land Use Associated Hazards,” previous soil testing conducted for the Phase 4a Project indicate the presence of elevated concentrations of some pesticides used historically in the Basin. Project demolition and relocation activities may create a potential for construction workers or other people to be exposed to hazardous materials associated with existing and former agricultural and rural residential structures. These materials may include asbestos in underground pipelines, asbestos and lead-based paint in building materials, and/or PCBs in pole-mounted transformers. Some contaminants could be found within the project footprint that exceed pertinent ecological risk levels. Similarly, concentrations of particulates of concern in the air at the project fenceline and adjacent to residential property during construction activities could occur. Because not all areas of the Phase 4b Project footprint have been evaluated for the potential presence of hazardous materials, which are fairly likely to be present because of past and present agricultural use of the area, this impact is considered potentially significant. (Similar)

Mitigation Measure 4.16-c(1): Complete Recommendations Included in Phase I and/or II ESAs and Implement Required Measures

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of any construction activities, the project proponent(s) shall ensure that all recommendations from the Phase I ESAs, listed below, are implemented by the applicable property owner(s) in coordination with all Federal, state, and local regulatory agencies and in compliance with all Federal, state, and local laws and regulations:

APN 35-080-022: Conduct a Phase II ESA to evaluate stained soil found on the site and the contents of unlabeled containers located on the site if these areas will be used for the Phase 4b Project. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-120-007: Conduct a Phase II ESA to evaluate stained soil and the presence of pesticides and herbicides on the site and the contents of unlabeled containers located on the site if these areas will be used for the Phase 4b Project. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-150-005: Conduct a Phase II ESA if stained soil is discovered during earthmoving activities to evaluate stained soil and the presence of pesticides and herbicides on the site. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

APN 35-170-080: the project proponent(s) shall, as necessary, remove the existing septic system and discovered underground pipelines, in accordance with applicable Federal, state, and local laws and regulations.

APN 35-271-021: Conduct a Phase II ESA, if stained soil or strange odors are discovered during earthmoving activities, to evaluate stained soil and the presence of hazardous materials on the site. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.
APN 35-271-015: Conduct a Phase II ESA, if stained soil or strange odors are discovered during earthmoving activities, to evaluate stained soil and the presence of hazardous materials on the site. If piping is found during excavation, it shall be removed in accordance with applicable Federal, state, and local laws and regulations. In addition, the project proponent(s) shall work with PG&E to determine if on-site transformers contain PCBs.

Responsibility: Project proponent(s)

Timing: Before the start of construction activities on each respective parcel within the Phase 4b Project footprint

Implementing this mitigation measure would reduce the potentially significant impact from potential human exposure of known hazardous materials at the project site under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-significant level because known hazardous materials located within the Phase 4b Project footprint would be assessed in accordance with recommendations in the environmental site assessments; consultation with appropriate Federal, state, and local agencies would occur; and on-site contamination would be removed and properly disposed of by a licensed contractor in accordance with Federal, state, and local laws and regulations. (Similar)

Mitigation Measure 4.16-c(2): Complete Phase I and/or II ESAs, Soil, and/or Groundwater Investigations in Phase 4b Project Footprint Areas Not Covered by the Existing Phase I and/or II ESAs, and Implement Required Measures (e.g., Site Management and/or Other Contingency Plans)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Before the start of construction and earthmoving activities, on parcels where project-related earthmoving activities would occur (including borrow activities), the project proponent(s) shall conduct Phase I ESAs (if not previously conducted), Phase II ESAs (if necessary), and/or other appropriate testing, including, as necessary, analysis of soil and/or groundwater samples for the potential contamination sites that have been previously investigated. Recommendations in the Phase I and II ESAs to address any identified contamination shall be implemented before initiating ground-disturbing activities, and may include the following:

- Prepare a site management plan that contains protocols and procedures for excavation, use, disposal, and handling of soil containing pesticide residues or contaminants, and for identifying possible contamination during construction. The plan shall include measures for the safe transport, use, and disposal of pesticide residue impacted soil and building debris removed from the site. Soil reuse may include: containing portions of the affected topsoil within the core of seepage berms, with an overlay of clean soil to prevent surface runoff caused by rainfall erosion on the topsoil materials; rip, mix, and/or amend affected topsoil that is respread onto borrow sites, levee, and/or berm surfaces, to provide a plant growth medium and reduce the concentration of pesticide residues in the soil; establish native perennial grasses and other perennial vegetation cover (e.g., hay, alfalfa) on these planted surfaces to reduce sediment runoff that may be caused by rainfall erosion or surface irrigation; and improve the drainage of agricultural lands used as borrow/mitigation sites to reduce ponded water and minimize the discharge of sediments into nearby drainages. In the event that contaminated groundwater is encountered during site excavation activities, the contractor shall report the chemical concentrations to the appropriate regulatory agencies, dewater the excavated area, and treat the groundwater to remove the chemicals before discharge. The contractor shall comply with applicable Federal, state, and local laws and regulations. The plan shall outline measures for specific handling and reporting procedures for hazardous materials and disposal of hazardous materials removed from the site at an appropriate off-site disposal facility. The plan shall include, but shall not be limited to: delineations of the horizontal and
vertical extent and concentration of soil contamination; a list of required monitoring equipment to be on-site during soil excavation (e.g., an air quality meter shall be used at the fenceline during dust-producing activities); sampling and analysis protocol for additional soil investigations; a list of necessary agencies to be contacted if chemical concentrations in water, air, and/or soil exceed set threshold limits; and a list of necessary permits, reports, or other compliance mechanisms.

► Retain an industrial hygienist to prepare a construction worker health and safety plan, which shall include, but not be limited to: personal protective equipment for construction workers, a delineation of the horizontal and vertical extent of elevated arsenic levels, a list of required monitoring equipment to be on-site during contaminated soil excavation (e.g., air quality meter), and proper procedures in the event that stained soil is encountered.

► Retain a qualified professional to conduct an ecological risk assessment on any sites found to contain levels of contaminant exceeding pertinent ecological risk levels. The ecological risk assessment shall include, but not be limited to: potential chemicals of concern, biological characterization of the site, identification of potential exposure pathways, ecological receptors, and recommendations for and implementation of remediation, where feasible and practicable.

► Retain an air quality specialist to monitor the concentration of particulates of concern in the air at the project fenceline, adjacent to residential property to ensure compliance with Federal, state, and local laws and regulations, to the extent feasible and practicable. Airborne particulate monitoring should be performed in the on-site worker’s breathing zone using the Particulate Not Otherwise Specified (NOS) concentrations standard of 5 mg/m³ as well as at the project boundaries using the Fenceline Particulate NOS goal of 0.3 mg/m³.

► Retain a licensed contractor to remove underground storage tanks (USTs), aboveground storage tanks (ASTs), and stained soils in accordance with applicable Federal, state, and local laws and regulations.

► Retain a licensed contractor to remove and dispose of asbestos cement pipe found within the Phase 4b Project area in accordance with applicable Federal, state, and local laws and regulations.

► Retain a licensed contractor to remove septic systems, water wells, and other underground structures, as needed, in accordance with applicable Federal, state, and local laws and regulations.

► Retain an asbestos specialist who is certified by the Cal/OSHA to investigate whether asbestos-containing materials or lead-based paints are present before demolition of on-site buildings and utilities. If materials containing asbestos or lead are found, they shall be removed by an accredited contractor in accordance with EPA and Cal/OSHA standards. In addition, activities (construction or demolition) in the vicinity of these materials shall comply with Cal/OSHA asbestos and lead worker construction standards. The materials containing asbestos and lead shall be disposed of properly at an appropriate off-site disposal facility.

► Obtain an assessment conducted by SMUD and/or PG&E pertaining to the contents of the existing pole-mounted transformers that would be relocated as part of the Phase 4b Project. The assessment shall determine whether existing on-site electrical transformers
contain PCBs and whether there are records of spills from such equipment. If equipment containing PCBs is identified, the maintenance and/or disposal of the transformer shall be subject to the regulations of the Toxic Substances Control Act under the authority of the Sutter County Environmental Health Division and Sacramento County Environmental Management Department.

► Identify oil and gas well locations. Prepare and implement a California Department of Oil, Gas, and Geothermal Resources well review program, if necessary.

► Notify the appropriate Federal, state, and local agencies, as required, if evidence of previously undiscovered soil or groundwater contamination (e.g., stained soil, odorous groundwater) is encountered during construction activities. Areas with chemical concentrations exceeding regulatory levels shall be cleaned up in accordance with recommendations made by the Sutter County Environmental Health Division, Sacramento County Environmental Management Department, Central Valley RWQCB, DTSC, or other appropriate Federal, state, or local regulatory agencies as generally described above.


Responsibility: Project proponent(s)

Timing: Before the start of construction activities

Implementing this mitigation measure would reduce the potentially significant impact from possible human exposure to unknown hazardous materials at the project sites to a less-than-significant level under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative because potentially hazardous materials would be identified; a site management plan that specifies remediation activities and procedures to appropriately identify, stockpile, handle, reuse and/or remove and dispose of hazardous materials would be prepared and implemented; monitoring activities would be implemented to ensure that construction workers and the general public are not exposed to unsafe levels of hazardous materials; and hazardous materials that are encountered would be removed and properly disposed of or otherwise remediated by licensed contractors in accordance with Federal, state, and local laws and regulations. (Similar)

Impact 4.16-d: Interference with an Adopted Emergency Evacuation Plan

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to interfere with adopted emergency evacuation plans. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could damage roadways. Road closures could create increases in traffic levels that could interfere with the use of main roadways for emergency evacuation routes. Because the effects of a levee failure are unpredictable, a precise determination
of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would increase traffic on local roadways associated with construction trips. In addition, temporary road closures associated with levee improvements could cause or contribute to temporary increases in traffic levels as traffic is detoured or slowed on some local roadways and SR 99. During construction increased traffic congestion could interfere with the use of main roadways for emergency evacuation routes, including Airport Boulevard, Arena Boulevard, Del Paso Road, El Centro Road, Elkhorn Boulevard, Elverta Road, Garden Highway, Natomas Boulevard, Northgate Boulevard, Power Line Road, San Juan Road, Truxel Road, West El Camino Avenue, SR 99, I-5, and I-80. See Section 4.10, “Traffic and Circulation,” for further discussion of traffic-related impacts. This temporary impact is considered significant. (Similar)


Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall implement Mitigation Measures 4.10-a and 4.10-c, set forth in Section 4.10, “Traffic and Circulation,” to avoid impairment of the Natomas Basin emergency evacuation routes.

Responsibility: Project proponent(s)

Timing: Before the start of construction activities

Implementing this mitigation measure would reduce the temporary impact from the potential interference with an adopted emergency evacuation plan under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-significant level because the appropriate state and local agencies would be involved in implementing detours to ensure acceptable traffic flow and reduce the risk of impairment to emergency evacuation routes. (Similar)

Impact 4.16-e: Possible Hazardous Emissions or Handling of Hazardous or Acutely Hazardous Materials, Substances, or Waste within One-Quarter Mile of an Existing or Proposed School

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to release hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A levee failure in the Natomas Basin could result in flooding that could damage the Natomas Basin in such a way that hazardous substances could be emitted or handled within one-quarter mile of an existing or proposed school. However, in the event of a catastrophic flood event, the affected areas would be
evacuated and students would not attend school in the immediate aftermath. Because no students would be affected by a potential hazardous substance emission, this impact is considered less than significant. (Lesser)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Seven schools are located within one-quarter mile of the Phase 4b Project footprint, as detailed in Section 3.16.2.4, “Schools within One-Quarter Mile of the Project Footprint.” Construction and maintenance activities and borrow excavation would involve the use of potentially hazardous materials, such as fuels (gasoline and diesel), oils and lubricants, and cleaners (which could include solvents and corrosives in addition to soaps and detergents), that are commonly used in construction projects. Additionally, undocumented contaminated soil or water may be found during construction. Because the potential exists for exposure to both known and previously unknown hazardous materials within one-quarter mile of a school during construction activities, this temporary impact is considered potentially significant. (Similar)

Mitigation Measure 4.16-e: Notify the Natomas Unified School District and Affected Schools within One-Quarter Mile of Project Construction Activities

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The project proponent(s) shall provide written notification of the project to the Natomas Unified School District and each of the affected schools within 30 days prior to SAFCA’s certification of the EIR and shall consult with Natomas Unified School District regarding the potential impacts on school children from hazards associated with Phase 4b Project implementation.

Responsibility: Project proponent(s)
Timing: Within 30 days of SAFCA certifying of this EIR

Implementation of this mitigation measure would reduce impacts associated with potential hazardous materials emissions related to schools within one-quarter mile of the project area to a less-than-significant level because under CEQA, the notification process is considered to satisfy the requirements of CEQA (California PRC Section 21151.4). (Similar)

Impact 4.16-f: Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to increase the number of wildlife at the Airport. None of the proposed borrow site activities, dewatering, filling, canal replacement, removal and replacement of trees, or creation of habitat described for the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative would occur. No additional new wildlife strikes would occur. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. Flooding is likely to result in changes in land surface in some areas, and areas retaining water for long periods even after floodwaters have receded. These conditions could result in high numbers of birds being attracted to the lands around the Airport (which is in a low-elevation area in the Basin) in the months following flooding and the resumption of Airport operations, increasing the potential for collisions
between aircraft and wildlife. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered **too speculative for meaningful consideration. (Currently Unknown)**

**Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative**

The Airport has one of the highest numbers of reported wildlife strikes with aircraft of all California airports (SCAS 2007). Collisions between aircraft and wildlife compromise the safety of aircraft passengers and flight crews. In an attempt to reduce wildlife collisions with aircraft, SCAS has maintained and implemented the WHMP for more than 10 years at the Airport. The plan identifies routine maintenance, hazardous wildlife habitat manipulation, and other land management activities as the most effective long-term preemptive measures for reducing wildlife hazards.

As described in FAA’s AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, the FAA recommends a separation distance of 10,000 feet between the Airport Operations Area and hazardous wildlife attractants (FAA 2007); this area is identified as Airport Perimeter B. Additionally, the FAA recommends a distance of 5 statute miles between the farthest edge of the Airport Operations Area and hazardous wildlife attractants (FAA 2007). Open water and agricultural crops are recognized as being the greatest wildlife attractants in the Airport vicinity, and rice cultivation is considered the most incompatible agricultural crop because of its flooding regime. Wildlife attractants near the runways are of greatest concern because, nationally, 74% of bird-aircraft strikes occurred at or below 500 feet above ground level (Cleary, Dolbeer, and Wright 2004). The area within a 10,000-foot radius of the Airport Operations Area is where arriving and departing aircraft are typically operating at or below 2,000 feet, an altitude that also corresponds with most bird activity (SCAS 2007).

Generally, the Airport Perimeter B is currently used for agricultural purposes, a land use practice that is considered to attract hazardous wildlife. Realignment of the portion of the existing West Drainage Canal located immediately south of I-5, would move that portion of the canal farther from the Airport Operations Area; however, the realigned portion of the canal would remain in the Approach-Departure Zone and within Airport Perimeter B. Additionally, the relocated alignment would be approximately 0.25-mile longer than the existing alignment, which would increase open water within the Approach-Departure Zone and Airport Perimeter B. Also, the slope of the bank would be flattened to a 3:1 slope, and benches for planting tules would be created. The increase in open water along with the creation of benches for planting of tules would potentially create additional habitat for hazardous wildlife (e.g., black birds); however, the project proponent(s) would work with SCAS to design the relocated and improved West Drainage Canal to minimize new hazardous wildlife attractants by complying with applicable FAA guidance. For these reasons, this impact would be **less than significant. (Similar)**

**Mitigation Measure: No mitigation is required.**

**Impact 4.16-g: Aircraft Safety Hazards Resulting from Project Implementation**

**No-Action Alternative**

Under the No-Action Alternative, no Phase 4 Project construction activities would occur; therefore, no potential exists for the project to introduce a safety hazard within or near the Airport Perimeter B. There would be no impact. **(Lesser)**

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases
of NLIP must be implemented. Extensive night lighting may be necessary near or within the Airport Perimeter B for emergency operations, which could pose a potential safety hazard. Because the effects of a levee failure are unpredictable, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Nine airports/airstrips are located within 2 miles of the Phase 4b Project footprint, as described in Section 3.16.2.5, “Airport Safety.” Safety hazards associated with airports are generally related to construction of tall structures and the creation of wildlife attractants (e.g., wetlands, golf courses, and waste disposal operations) that could interfere with airplane flight paths. No tall buildings or other structures would be constructed as part of the Phase 4b Project. In addition, there would be no new hazardous wildlife attractants associated with the Phase 4b Project (see Impact 4.16-g, “Potential for Higher Frequency of Collisions between Aircraft and Wildlife at Sacramento International Airport,” for more information).

In Sacramento River east levee Reaches C:4A–6A, the proposed Natomas Levee Class I Bike Trail would be constructed on Federally Obligated Land that was acquired with a combination of Sacramento County funds and FAA grant funds, and thus can only be used for Airport purposes (see Impact 4.3-a, “Inconsistency with Airport Master Plan, Airport Land Use Compatibility Plan, and Airport Wildlife Hazard Management Plans”). In addition, although the Natomas Levee Class I Bike Trail Project is conceptual at this stage and no alignment has been selected, it is intended that the bike trail would generally follow the Natomas Basin perimeter levee system (Plate 2-19), putting it within one-half mile of the Airport Operations Area in Reaches C:5A–6A of the Sacramento River east levee (see Plate 1-7). Therefore, the proposed Natomas Levee Class I Bike Trail would intensify land use in an area where public safety is of critical concern to SCAS and the FAA. If Airport safety is not taken into consideration in the design of the Natomas Levee Class I Bike Trail Project, the potential exists for the bike trail to pose an aircraft safety hazard. Because the extent and severity of potential impacts cannot be evaluated at a detailed project-level, this long-term impact is considered potentially significant. (Similar)

Mitigation Measure 4.16-g: Consult with SCAS and the FAA during Design of the Proposed Natomas Levee Class I Bike Trail to Implement Appropriate Airport Safety Precautions

Sacramento County Department of Transportation (SacDOT), Sutter County, and the City of Sacramento to shall consult with SCAS and the FAA to ensure that applicable regulations and safety precautions are considered and built into construction of the proposed Natomas Levee Class I Bike Trail. These safety precautions shall include project elements that would reduce opportunities for hazards to the Airport and public, and may include features such as fencing, increased security personnel, and special consideration of alignment and parking areas near the Airport. The Natomas Levee Class I Bike Trail shall not be opened for use until these elements are completed.

Responsibility: SacDOT, Sutter County, and the City of Sacramento

Timing: Before the start of construction of the proposed Natomas Levee Class I Bike Trail

SacDOT is responsible for implementing this mitigation measure, which would reduce the potential for the Natomas Levee Class I Bike Trail Project to pose an aircraft safety hazard to a less-than-significant level. Site-specific impacts of the identified improvements will be assessed pursuant to CEQA requirements when the specific alignment has been selected and designed, separate from the NPACR/Phase 4b Project EIS/EIR. Any such necessary environmental review will be completed before implementation of the bike trail. The proposed Natomas Levee Class I Bike Trail falls under the jurisdiction of Sacramento (SacDOT) and Sutter Counties, and the City of Sacramento; therefore, neither USACE nor SAFCA, as the project proponent(s) would
have control over the timing or implementation of the mitigation measure. Thus, this impact would remain significant and unavoidable. (Similar)

Impact 4.16-h: Potential Exposure to Wildland Fires

No-Action Alternative

No Phase 4b Project Construction

Under the No-Action Alternative, no Phase 4b Project construction activities would occur; therefore, no potential exists for the project to expose people or structures to wildland fires. There would be no impact. (Lesser)

Potential Levee Failure

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all phases of NLIP must be implemented. A recently flooded area is not likely to be dry enough to sustain a fire that would pose significant risk of loss, injury, or death. However, if accumulated debris from uprooted vegetation or structures remained in place long enough to dry out, there would be a potential for increased fire hazard. However, the potential for such an occurrence is uncertain, and the magnitude of the effect cannot be predicted; therefore, a precise determination of significance is not possible and cannot be made. Because of this uncertainty, this potential impact is considered too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

Although no “Very High Fire Hazard Severity Zones” are located in the Phase 4b Project area, and the majority of Sutter and Sacramento Counties are located in either a “nonflammable” or “moderate” zone for wildland fires, the project components would be constructed in locations where physical and weather conditions may combine to lead to a high risk of fire hazard. Construction equipment or construction practices could accidentally ignite fires that may result in wildland fires and expose people or structures to a significant risk of loss, injury, or death under some circumstances. This potential temporary impact is considered potentially significant. (Similar)

Mitigation Measure 4.16-h: Prepare and Implement a Fire Management Plan to Minimize Potential for Wildland Fires

The project proponent(s) shall prepare and implement a fire management plan in coordination with the appropriate emergency service and/or fire-suppression agencies of the applicable local jurisdictions before the start of project construction. The plan shall describe fire prevention and response methods, including fire precaution, pre-suppression, and suppression measures that are consistent with the policies and standards of the affected jurisdictions. All materials and equipment required for implementation of the plan shall be maintained on-site. All construction personnel shall be made familiar with the contents of the plan before construction activities begin.

Responsibility: Project proponent(s)
Timing: Prepare fire management plan before the start of Phase 4b Project construction activities; conduct construction personnel training before the start of construction activities; and implement measures during construction

Implementing this mitigation measure would reduce the potential temporary impact from exposure to wildland fires under the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative to a less-than-
significant level, because a plan to provide project-specific fire prevention and response would be prepared and implemented. *(Similar)*

### 4.16.3 Residual Significant Impacts

Impacts associated with spills of hazardous materials, exposure to hazardous materials or interference with emergency evacuation, increased hazards in the vicinity of the Airport or increased frequency of wildlife airstrikes, and increased wildfire hazards due to the No-Action Alternative are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

Implementation of the mitigation measures described in this section for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would reduce all potential impacts associated with spills of hazardous materials, potential land use constraints due to contamination within the Pumping Plant No. 8 footprint and potential exposure of construction workers and the general public to contaminated groundwater, exposure to hazardous materials or interference with emergency evacuation, and increased wildfire hazards to less-than-significant levels.

The mitigation measure described in this section for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative for increased hazards associated with the Airport as a result of implementation of the Natomas Levee Class I Bike Trail is the responsibility of SacDOT, Sutter County, and the City of Sacramento. However, neither USACE nor SAFCA, as the project proponent(s) would have control over the timing or implementation of the mitigation measure. Thus, this impact would remain significant and unavoidable.
4.17 ENVIRONMENTAL JUSTICE

Environmental justice is defined by the U.S. Environmental Protection Agency (EPA) Office of Environmental Justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” Fair treatment means that “no group of people, including racial, ethnic, or socioeconomic group, shall bear a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies.” Analysis of project effects on environmental justice is required by NEPA.

4.17.1 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

4.17.1.1 METHODOLOGY

The following analysis is based on Environmental Justice, Guidance Under the National Environmental Policy Act, prepared by the Council of Environmental Quality (CEQ) and the Executive Office of the President (CEQ 1997). Although none of the published guidelines define the term “disproportionately high and adverse,” CEQ includes a non-quantitative definition stating that an effect is disproportionate if it appreciably exceeds the risk or benefit rate to the general population.

Under the CEQ guidelines, the first step in conducting an environmental justice analysis is to determine the presence of minority and low-income populations (CEQ 1997:25). The second step of an environmental justice analysis requires that the Federal agency determine if the Federal action would result in disproportionately high or adverse health or environmental effects (CEQ 1997:26). The CEQ guidance indicates that when determining whether the effects are high and adverse, agencies are to consider whether the risks or rates of impact “are significant (as employed by NEPA) or above generally accepted norms” (CEQ 1997:26). The CEQ offers a non-quantitative definition stating that an effect is disproportionate if it appreciably exceeds the risk or rate to the general population (CEQ 1997:26). The environmental justice analysis is based on a review of relevant demographic data to define the relative proportion of minority and low-income populations in the Natomas Basin to determine whether the Phase 4b Project would result in environmental justice affects on the relevant populations. (See Section 3.17, “Environmental Justice,” and Appendix H for the demographic data used to conduct this analysis.)

This section compiles demographic data on income and minority status for census block groups that occur in the Natomas Basin, and then compares these data with the demographic profiles of Sutter and Sacramento Counties to determine if the Natomas Basin contains significant minority or low-income populations. Table 3.17-1 presents the relative proportion of the population that responded as members of minorities or as low-income households during the 2000 Census. These data are based upon Appendix H, which compiles and explains the source of these data (U.S. Census Bureau 2006).

The Natomas Basin does not contain a significant low-income population, as indicated in Table 3.17-1 (e.g., the low-income population in the Natomas Basin is greater than 50% of the total population in the Natomas Basin, or the low-income population in the Natomas Basin is substantially greater than in Sacramento or Sutter Counties. The Sutter County portion of the Natomas Basin has a minority population that is less than 50% of the total (23.34%), and is also lower than the proportion of minorities in Sacramento and Sutter Counties (42.24% and 39.78%, respectively). The Sacramento County portion of the Natomas Basin, however, does contain a significant minority population (60.35% of the total population for those census block groups).

4.17.1.2 THRESHOLDS OF SIGNIFICANCE

To prove a violation of Federal environmental justice principles, low-income populations, individuals belonging to minority populations, and/or minority populations (i.e., Native American or Alaskan Native, Asian or Pacific
Islander, African American, black, not of Hispanic origin, or Hispanic) must be affected by the project. According to CEQ, two types of environmental justice impacts may exist: disproportionately high and adverse human health effects and disproportionately high and adverse environmental effects. Determination of disproportionately high and adverse human health effects considers whether any of the following criteria would exist:

- The health effects, which may be measured in risks and rates, are significant (as defined by NEPA), or above the generally accepted norm. Adverse health effects may include bodily impairment, infirmity, illness, or death.

- The risk or rate of hazard exposure by a minority population, low-income population, or Native American tribe to an environmental hazard is significant (as defined by NEPA) and appreciably exceed the risk or rate to the general population or other appropriate comparison group.

- The health effects occur in a minority population, low-income population, or Native American tribe affected by cumulative or multiple adverse exposures from environmental hazards.

Determination of a disproportionately high and adverse environmental effect considers whether any of the following criteria would exist:

- There is or would be an impact on the natural or physical environment that significantly (as defined by NEPA) and adversely affects a minority population, low-income population, or Native American tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Native American tribes when those impacts are interrelated to impacts on the natural or physical environment.

- The environmental effects are significant (as defined by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Native American tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.

- The environmental effects occur or would occur in a minority population, low-income population, or Native American tribe affected by cumulative or multiple adverse exposures from environmental hazards.

### 4.17.2 IMPACTS AND MITIGATION MEASURES

**Impact 4.17-a: Potential to Have a Disproportionate High and Adverse Environmental Impact on any Minority or Low-Income Populations**

**No-Action Alternative**

**No Phase 4b Project Construction**

Under the No-Action Alternative, no Phase 4b Project improvements would be made to the Natomas perimeter levee system and there would be no potential to have disproportionately high and adverse environmental impacts on any minority or low-income populations. There would be no impact. *(Lesser)*

**Potential Levee Failure**

Without Phase 4b Project improvements to the Natomas perimeter levee system, the risk of levee failure would still remain high because to achieve the full benefits of flood damage reduction in the Natomas Basin, all NLIP phases must be implemented. If the primary location of flooding occurred in the Sacramento County portion of the Basin, flooding could cause disproportionately impact to minority or low-income populations by causing displacement of people from their homes, disruption of business, damage to property, and injury or death. However, it is equally probable that a levee breach would occur in the northern half of the Basin (in Sutter
County), which has relatively low population density and a low minority population in relation to the total population (23.34%). Determination of the location, and thus the impact of a levee breach, is speculative. Therefore, a precise determination of significance is not possible and cannot be made because the location and extent of the magnitude of the potential impact is unknown. Because of this uncertainty, this potential impact is considered to be too speculative for meaningful consideration. (Currently Unknown)

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

The Phase 4b Project would reduce the risk of flooding to existing residential, commercial, and industrial development in the Natomas Basin. While there are low-income and minority populations present in a portion of the Phase 4b Project area, as discussed in Section 3.17, “Environmental Justice,” the flood damage reduction benefits of the project would accrue to all segments of the population in the Natomas Basin. Any potential environmental effects on low-income and minority neighborhoods would be the same types of impacts experienced throughout the project area (e.g., primarily temporary exposure to construction noise, dust, erosion, and light and glare during construction), and no permanent residential relocations would disproportionately affect low-income areas or areas with high minority populations. Therefore, the project would not have a disproportionately high and adverse environmental impact on any minority or low-income populations.

Executive Order 12898, which is described more fully in Chapter 6, “Compliance with Federal Environmental Laws and Regulations,” requires that the lead Federal agency consider the effects of an action on Native American tribes and determine if the adverse effects are disproportionate to the beneficial aspects of the action. As described in Section 4.10, “Cultural Resources,” many elements of the project have the potential to adversely affect cultural resources that possess particular cultural significance and value to Native American individuals and organizations that are culturally affiliated with the prehistoric inhabitants of the Natomas Basin. Construction of improvements such as seepage berms and cutoff walls, as well as the excavation of large quantities of borrow from a range of possible sites, has the potential to damage prehistoric archaeological assemblages, including interred skeletal remains (see Section 2.3.3 for a discussion of potential borrow sites.) The ancestors of the Native American tribes that dwelled on the project site in the past may not necessarily experience the direct beneficial aspect of flood damage reduction in the Natomas Basin. This raises an environmental justice concern because the project could disturb and/or damage cultural resources of importance to the Native American community, while the Native American community would not receive a proportionate benefit from flood damage reduction because they live in dispersed locations, largely outside of the Natomas Basin. This is a significant impact with respect to environmental justice. (Similar)

Mitigation Measure 4.17-a: Increase the Direct Benefits of the Project for the Ancestors of the Native American Tribes

Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative

As part of the Phase 4b Project, the project proponent(s) proposes to acquire various properties in the Natomas Basin as compensation for the project’s potential impacts, as required under Federal and state laws. As part of the process for restoring these lands, the project proponent(s) shall implement the following measures to address environmental justice and increase the direct benefits to the ancestors of the Native American tribes that would bear disproportionate adverse effects:

► consult with appropriate Native American representatives to identify plant species of value for traditional cultural uses;

► consult with Native American representatives to identify traditional cultural activities that could occur on these lands, consistent with habitat conservation and safety objectives;

► to the extent feasible, include identified plant species in the planting palettes developed for habitat conservation;
to the extent feasible, establish easements or other protective measures on these properties that include access for appropriate Native American representatives for plant gathering and other traditional cultural activities; and

where feasible, also provide access to appropriate Native American representatives to the river front on acquired parcels that have access to the Sacramento River, provided that access does not permit the construction of physical structures on the levee, beaches, or in the river without prior approval from the appropriate regulatory agency.

**Responsibility:** Project proponent(s)

**Timing:** During project design and construction

Implementing this mitigation measure would reduce the impact to a less-than-significant level because it would provide the ancestors of the Native American tribes with a benefit that would offset the disproportionate burden created by impacts to cultural resources of concern, and of great value to the Native American community, caused by the Adjacent Levee Alternative (Proposed Action) and the Fix-in-Place Alternative. *(Similar)*

### 4.17.3 Residual Significant Impacts

In the event of a levee failure under the No-Action Alternative, impacts to minority or low-income populations or Native American tribes are uncertain. Because of this uncertainty, these potential impacts are considered too speculative for meaningful consideration. Additionally, mitigation measures cannot be required for the No-Action Alternative; therefore, impacts that result from the No-Action Alternative would not be mitigated.

With implementation of the mitigation measure described in this section, project implementation would not result in any residual significant impacts related to environmental justice.
4.18 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FROM PREVIOUS NATOMAS LEVEE IMPROVEMENT PROGRAM PHASE 1–4a LANDSIDE IMPROVEMENTS PROJECTS

4.18.1 INTRODUCTION

Because this EIS/EIR will support the approval of USACE’s Common Features GRR and Common Features/Natomas PACR, it must summarize impacts and mitigation measures from all previous NLIP phases.

4.18.2 SUMMARY OF PHASE 1–4a PROJECTS

Table 4.18-1 presents the NLIP Landside Improvements Project’s major components and construction timing of each project phase. Years are shown in the table below to identify the anticipated starting point of each project phase; however, only some components of each project phase would begin in the first year of construction (e.g., while some portions of the Phase 3 Project began in 2009, proposed levee work would not begin until 2010). Further, the project phases, while originally envisioned to be constructed in the order they are numbered, could be constructed out of order (e.g., the Phase 4a Project, or components thereof, could be constructed before the Phase 3 Project) depending on project design and other factors. Project phasing and construction sequencing of project components are not necessarily dependent upon one another, but are dependent more on the availability and timing of funding. Because each project is analyzed in the cumulative context of the entire NLIP Landside Improvements Project, there will be no undisclosed impacts if the order of construction is altered.

<table>
<thead>
<tr>
<th>Project Phase and Construction Timing</th>
<th>Project Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 Project 2007–2008 Construction Complete</td>
<td>Natomas Cross Canal (NCC) south levee improvements (westernmost 12,500 feet): Through-seepage and underseepage remediation</td>
</tr>
<tr>
<td>Phase 2 Project 2009–2010</td>
<td>Sacramento River east levee Reach C:1–4B: Levee raising and seepage remediation Relocation of the Upper Elkhorn Canal (North Drainage Canal to Elkhorn Reservoir) Construction of the Upper GGS/Drainage Canal (North Drainage Canal to just south of Elkhorn Reservoir) Removal of a deep culvert at Reclamation District (RD) 1000 Pumping Plant No. 2 Borrow and reclamations at: Airport north bufferlands, Brookfield, Dunmore, RD 1001, and Sutter Pointe Habitat creation and management Right-of-way acquisition Encroachment management Infrastructure relocation and realignment Reconstruction of Garden Highway intersections</td>
</tr>
<tr>
<td>Phase 3 Project 2009–2010</td>
<td>Sacramento River east levee (Reach B:5A–9B): Levee raising and seepage remediation Pleasant Grove Creek Canal (PGCC) west levee: Levee raising, slope flattening, and widening; and seepage remediation Natomas East Main Drainage Canal (NEMDC) west levee (Elkhorn Boulevard to NEMDC Stormwater Pumping Station): Levee widening and flattening and seepage remediation NEMDC west levee (NEMDC Stormwater Pumping Station to Northgate Boulevard): Seepage remediation and slope stability remediation Relocation of approximately 9,400 feet of the Elkhorn Canal (highline irrigation canal) downstream of Elkhorn Reservoir Construction of a new GGS/Drainage Canal downstream of Elkhorn Reservoir Reconstruction of RD 1000 Pumping Plant No. 2 Habitat creation and management Infrastructure relocation and realignment</td>
</tr>
<tr>
<td>Project Phase and Construction Timing</td>
<td>Project Component</td>
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<tr>
<td>Landside vegetation removal (Sacramento River east levee Reach B:10–12A)</td>
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<tr>
<td>Right-of-way acquisition</td>
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<td>Encroachment management</td>
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<tr>
<td>Borrow and reclamation at Airport north bufferlands; Brookfield; Dunmore; Elkhorn Borrow Area; Lower Woodland Corridor; Krumenacher; Novak; Pacific Terrace; private property (in Reaches B:5A, B:6B, and B:7); RD 1001; South Sutter, LLC; Sutter Pointe; and Twin Rivers Unified School District</td>
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<tr>
<td>Reconfiguration of Airport West Ditch to allow for dewatering</td>
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<td>Reconstruction of Garden Highway intersections</td>
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<tr>
<td>Sacramento River east levee (Reach B:10–15): Levee raising and seepage remediation</td>
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<tr>
<td>Sacramento River east levee Reach C:4B: Seepage remediation</td>
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<tr>
<td>NCC south levee: Levee raising and seepage remediation at two locations</td>
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<tr>
<td>Replacement of South Lauppe Pump</td>
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<tr>
<td>Riverside Canal (highline irrigation canal) relocation and extension</td>
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<tr>
<td>Modifications to Natomas Central Mutual Water Company’s Riverside Pumping Plant and RD 1000’s Pumping Plants Nos. 3 and 5</td>
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<tr>
<td>Development of new and replacement groundwater wells</td>
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<tr>
<td>Borrow site excavation and reclamation at Fisherman’s Lake Borrow Area (including Novak); I-5 Borrow Area; Elkhorn Borrow Area; South Sutter, LLC; Krumenacher; Twin Rivers Unified School District stockpile; and Airport north bufferlands</td>
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<tr>
<td>Habitat creation and management</td>
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<tr>
<td>Infrastructure relocation and realignment</td>
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<tr>
<td>Landside and waterside vegetation removal</td>
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<tr>
<td>Landside vegetation removal in Sacramento River east levee Reach B:12A–15</td>
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<td>Right-of-way acquisition</td>
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<td>Encroachment management</td>
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<tr>
<td>Exchange of properties between SAFCA and the Sacramento County Airport System in Reaches C:4A, B:5B, and B:6 of the Sacramento River east levee</td>
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<tr>
<td>Reconstruction of Garden Highway intersections</td>
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<tr>
<td>Sacramento River east levee (Reach A:16–20): Levee widening/rehabilitation and seepage remediation</td>
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<tr>
<td>Sacramento River east levee (Reach B:10–15): Levee raise extension</td>
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<tr>
<td>American River north levee (Reach 1:1–4): Slope flattening and seepage remediation</td>
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<tr>
<td>NEMDC North (Reaches F–G): Levee raising, slope flattening, and seepage remediation</td>
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<tr>
<td>PGCC (Reach E) and NEMDC South (Reach H): Levee raising and slope flattening</td>
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<tr>
<td>PGCC (Reach E) and NEMDC South (Reach H): Waterside improvements</td>
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<tr>
<td>PGCC (Reach E) culvert remediation</td>
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<td>State Route (SR) 99 NCC Bridge remediation (Reach D:6)</td>
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<td>West Drainage Canal</td>
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<tr>
<td>Riego Road Canal (highline irrigation canal) relocation</td>
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<td>NCC south levee ditch relocations</td>
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<td>Modifications to the RD 1000 Pumping Plants</td>
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<tr>
<td>Modifications to City of Sacramento Sump Pumps</td>
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<tr>
<td>Borrow site excavation and reclamation at South Fisherman’s Lake Borrow Area, Westside Lake School Site, and Triangle Properties Borrow Area</td>
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<tr>
<td>Habitat creation and management</td>
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<td>Infrastructure relocation and realignment</td>
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<td>Landside vegetation removal</td>
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<tr>
<td>Waterside vegetation removal</td>
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<tr>
<td>Bank protection</td>
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<tr>
<td>Right-of-way acquisition</td>
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<tr>
<td>Encroachment management</td>
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<tr>
<td>Natomas Levee Class 1 Bike Trail Project</td>
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</tbody>
</table>

Notes: Airport = Sacramento International Airport; GGS = Giant Garter Snake; I-5 = Interstate 5; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District

Source: Data compiled by AECOM in 2009, based on information provided by SAFCA
4.18.3 SUMMARY OF PHASE 1–4a PROJECTS’ IMPACTS

The Phase 1 Project’s environmental impacts and mitigation are addressed in detail in the Local Funding EIR; the Phase 2 Project’s environmental impacts and mitigation are addressed in detail in the Phase 2 EIR, Phase 2 SEIR, and Phase 2 EIS; the Phase 3 Project’s environmental impacts and mitigation are addressed in detail in the Phase 3 EIS and EIR; and the Phase 4a Project’s environmental impacts and mitigation are addressed in detail in the Phase 4a EIS and EIR. Addenda to the Phase 2 and 3 EIRs address minor modifications to these project phases. Table 4.18-2 summarizes the environmental impacts associated with the Phase 1–4a Projects’ impacts which are addressed in the following documents:

► Local Funding EIR (SAFCA 2007a),
► Phase 2 EIR (SAFCA 2007b),
► Phase 2 EIS (USACE 2008),
► Phase 2 Supplemental EIR (SAFCA 2009a),
► Phase 2 EIR 1st Addendum (SAFCA 2009c),
► Phase 2 EIR 2nd Addendum (SAFCA 2009d),
► Phase 3 EIS and EIR (USACE 2009 and SAFCA 2009b),
► Phase 3 EIR Addendum (SAFCA 2009e), and
► Phase 4a EIS and EIR (USACE 2010 and SAFCA 2009f).

Table 4.18-3 summarizes the quantifiable environmental impacts associated with the Phase 1–4a Projects (Proposed Actions), as presented in the previous environmental documents identified above.

Impacts are based on the project description of each respective project phase at the time each of the environmental documents was written. When assumptions were necessary regarding potential overlapping of phases, the assumptions with the greatest impacts were made to present a worst-case analysis of impacts for the environmental analysis; actual impacts would be somewhat less than presented in Table 4.18-3 because of the worst-case assumptions used to derive the quantitative impacts.
### Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects’ Impacts (Proposed Action)

<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Summary of Environmental Impact</th>
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</thead>
<tbody>
<tr>
<td><strong>Phase 1 Project</strong></td>
<td>Construction of the cutoff wall would occur along the existing levee centerline and would not alter the levee footprint or result in changes to the floodway. Therefore, there would be no permanent conversion of Important Farmland to nonagricultural uses and no agricultural land would be permanently removed from production. During the construction period, approximately 1 acre along the landside levee toe between the levee and canal would be used for construction staging, including storage for construction equipment and other vehicles. Cutoff wall construction would require the temporary establishment of an on-site batch plant that would occupy about 1 to 2 acres. To the extent feasible, the construction staging area and the temporary batch plant would be sited on land that is not cultivated, between the levee toe and actively farmed fields. Where construction activity would encroach on an agricultural field, the encroachment would be temporary and the land would be farmable following the end of construction activity. The potential haul routes are located on previously disturbed land and established roadways and access roads. Therefore, impacts to Important Farmland would be less than significant.</td>
</tr>
<tr>
<td><strong>Phase 2 Project</strong></td>
<td>Important Farmland would be converted for maintenance activities and encroachment prevention associated with widening the landside footprint of the NCC south levee and associated maintenance access corridor, which would substantially widen the footprint of the Sacramento River east levee’s flood damage reduction facilities. Soil borrow sites for the improvements include the Brookfield site and the RD 1001 site. Borrow material for the Sacramento River east levee improvements would come from the Airport north bufferlands sites, the Dunmore site, or potentially the Sutter Pointe site. These borrow sites are in areas classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Except at the RD 1001 site, removing borrow from borrow sites would entail preserving and replacing the topsoil on these parcels, thus retaining their potential use for agriculture. The permanent conversion of Important Farmland would be a significant impact. No feasible mitigation measures are available to compensate for the permanent loss of farmland; therefore, with the implementation of mitigation measures the impact would remain significant and unavoidable.</td>
</tr>
<tr>
<td><strong>Phase 3 Project</strong></td>
<td>Important Farmland would be permanently converted to nonagricultural use for widening of Sacramento River east levee Reach B:5A–9B, the PGCC levee improvements, and creation of marsh, grassland, and woodland habitat to compensate for habitat removed. Permanent conversion of Important Farmland would take place on the Lower Woodland and RD 1001 borrow sites. All other borrow sites would be reclaimed and returned to agricultural uses. Williamson Act contracts would be terminated on land acquired in Reach B:9B and on the Elkhorn Canal alignment. The permanent conversion of Important Farmland and cancellation of Williamson Act contracts is considered a significant impact. No feasible mitigation measures are available to compensate for the permanent loss of farmland; therefore, with the implementation of mitigation measures the impact would remain significant and unavoidable.</td>
</tr>
<tr>
<td><strong>Phase 4a Project</strong></td>
<td>Important Farmland would be permanently converted to nonagricultural use for widening of Sacramento River east levee Reach B:10–15, realignment and extension of the Riverside Canal, and creation of managed marsh in the Fisherman’s Lake Borrow Area. All other borrow sites would be reclaimed and returned to agricultural uses. The permanent conversion of Important Farmland would be a significant impact. No feasible mitigation measures are available to compensate for the permanent loss of farmland; therefore, with the implementation of mitigation measures the impact would remain significant and unavoidable.</td>
</tr>
</tbody>
</table>
### Table 4.18-2

Summary of Phase 1, 2, 3, and 4a Projects’ Impacts (Proposed Action)

<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Summary of Environmental Impact</th>
</tr>
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<tbody>
<tr>
<td><strong>Land Use, Socioeconomics and Population and Housing</strong></td>
<td><strong>Phase 1 Project</strong>&lt;br&gt;The Phase 1 Project would not develop infrastructure that would physically separate an identified community or residential cluster, would not conflict with land use planning and policies, would not alter the levee footprint or result in changes to the floodway, and there would be no change in permitted uses under the existing general plan land use and zoning designations for the project area. No agricultural land would be removed from production, and current agricultural uses could continue once construction is completed. Project activities at the RD 1001 borrow site may involve taking agricultural land out of production; however, use of the RD 1001 borrow site has been addressed by Sutter County in the <em>Reclamation Plan for Surface Mining Operation in Nicolaus, Sutter County</em> (Sutter County 1990). Because the project would not permanently result in the additional conversion of Important Farmland to nonagricultural uses, this impact would be less than significant.</td>
</tr>
<tr>
<td><strong>Geology, Soils, and Mineral Resources</strong></td>
<td><strong>Phase 2, 3, and 4a Projects</strong>&lt;br&gt;The Phase 2, 3, and 4a Projects would be consistent with Policy B.10 of the City of Sacramento General Plan because they would reduce flood risk in accordance with Resource Protection Policy B.10, which states: “The City shall seek to minimize or avoid adverse impacts to historic and cultural resources from natural disasters. To this end, the City shall promote seismic safety, flood protection, and other building programs that preserve, enhance, and protect these resources.” Portions of the Phase 3 and 4a Projects’ levee improvement footprints would overlap parts of the Airport Critical Zone (Perimeter B). The flood damage reduction improvements would not modify intended land uses within those areas, nor would they include components such as the creation of water features that could attract waterfowl, thereby introducing hazards into the Airport Critical Zone (Perimeter B). The improvements also would not conflict with implementation of the adopted Airport master plan, Airport land use compatibility plan, or Airport wildlife hazard management plans.</td>
</tr>
<tr>
<td><strong>Phase 1, 2, 3, and 4a Projects</strong></td>
<td>Borrow activities and levee improvement construction activities would temporarily disturb soil and could expose disturbed areas to erosion caused by wind or by winter or early-season rainfall events. Wind or rainfall of sufficient intensity could dislodge soil particles from the soil surface. Once particles are dislodged, substantial localized erosion could occur and grading and earthmoving activities would expose soils to wind erosion. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level. The Phase 1, 2, and 3 Projects would have no impacts related to mineral resources because no mineral resources are known to exist in these project areas. The Phase 4a Project would result in a potential loss of mineral resources due to project excavation of soil from the eastern edge of the Fisherman’s Lake Borrow Area, which is zoned MRZ-3 by the California Department of Conservation’s Division of Mines and Geology, indicating that the significance of mineral deposits in that area cannot be evaluated from existing data. Even with the implementation of mitigation measures, this impact would remain significant and unavoidable because mitigation cannot prevent the possible removal or disturbance of economically valuable mineral resources (if found).</td>
</tr>
</tbody>
</table>
### Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects' Impacts (Proposed Action)

<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Summary of Environmental Impact</th>
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</thead>
<tbody>
<tr>
<td><strong>Hydrology and Hydraulics</strong></td>
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</tr>
<tr>
<td><strong>Phase 1 Project</strong></td>
<td>The Phase 1 Project would entail constructing a cutoff wall in a portion of the NCC south levee. Neither the height nor prism of the levee would be altered. Therefore, the Phase 1 Project would have no effect on hydrology or hydraulics.</td>
</tr>
<tr>
<td><strong>Phase 2, 3, and 4a Projects</strong></td>
<td>Implementation of the Phase 2, 3, and 4a Projects would not measurably alter water surface elevations in the project area except in the most extreme circumstances (i.e., a 200-year [0.005 AEP] or 500-year [0.002 AEP] flood with no upstream levee failures despite 100 miles of levee overtopping in areas upstream of the Natomas Basin). The Phase 2, 3, and 4a Projects would not change the existing geometry of the channels surrounding the Natomas Basin; therefore, they would not cause substantial changes to water flow in these channels, or cause adverse hydraulic effects upstream or downstream of the project area during peak flows. The borrow sites would be 3–5 feet lower after the conclusion of borrow operations. These sites would be regraded and either developed as grassland or returned to agricultural cultivation. Project engineers would coordinate with owners and operators of local drainage systems to evaluate pre-project and postproject drainage needs to remediate any substantial project-related drainage disruption. Drainage from these sites would be routed to the existing drainage system for these lands. Because the project would temporarily or permanently alter the existing drainage pattern of the project area, localized flooding could occur, resulting in a potentially significant impact. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level. The presence of cutoff walls could restrict the movement of groundwater in either direction (away from or toward the NCC or Sacramento River). Potential consequences are increases or decreases in the water levels in shallower wells and/or localized near-surface groundwater levels in areas immediately east and west of the cutoff wall. The evaluation of potential groundwater impacts prepared by Luhdorff &amp; Scalmanini Consulting Engineers concluded that there would be no substantial decrease in groundwater levels or well yields would be expected as a result of the cutoff wall construction. These impacts are considered less than significant.</td>
</tr>
<tr>
<td><strong>Water Quality</strong></td>
<td>Levee improvement activities have the potential to result in both short- and long-term water quality effects from runoff and sedimentation. Potentially affected waterways include the Sacramento River, NCC, Morrison Canal near the NCC south levee, PGCC, NEMDC, North Drainage Canal, West Drainage Canal, Riverside Canal, and Elkhorn Canal. Extensive ground-disturbing activities near these local drainages and waterways could potentially cause the waterways to become contaminated by soil or construction substances. Excavated areas that fill with groundwater or surface drainage during project construction would require dewatering. Effluent from dewatering operations typically contains high levels of suspended sediment and often high levels of petroleum products and other construction-related contaminants. Impacts on water quality are considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td><strong>Biological Resources: Fish and Aquatic Habitat</strong></td>
<td>Project construction activities could adversely affect migratory habitat for listed adult and juvenile Chinook salmon and steelhead that would be susceptible to water quality–related effects. Removal of riparian vegetation or woody material along the existing levee or otherwise in the floodplain could result in the loss of important shaded riverine aquatic habitat function. Modifications to pumping plants would require removing a small number of trees and trimming the canopies of other trees growing on the eroding bank. It is anticipated that any temporary construction losses...</td>
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Table 4.18-2
Summary of Phase 1, 2, 3, and 4a Projects’ Impacts (Proposed Action)

<table>
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<tr>
<th>Issue Area</th>
<th>Summary of Environmental Impact</th>
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<tbody>
<tr>
<td>Biological Resources: Sensitive Aquatic Habitats</td>
<td>of overhead shaded riverine aquatic habitat cover would be fully replaced by on-site mitigation planting. Although no permanent impacts would occur, this impact would not reach less-than-significant levels for 10–15 years, while replacement plantings reach maturity.</td>
</tr>
<tr>
<td>Phase 1 Project</td>
<td>The seasonal wetland between the levee and TNBC reserve could be affected by movement of construction equipment and staging activities to support improvements along the adjacent levee reach. Levee improvements are also anticipated to require removal of a limited amount of trees near the top of the waterside of the levee to accommodate removal of the top of the levee for slurry wall construction and additional excavation and reconstruction of approximately 600 feet above the ordinary high water mark within NCC Reach D:2 to repair slip failures of the waterside slope of the levee. Because these resources have a very limited local distribution, such effects could have a substantial adverse effect on a local scale. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.</td>
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<tr>
<td>Phase 2 Project</td>
<td>Up to 70 acres of jurisdictional wetlands could be temporarily affected by the Phase 2 Project’s borrow activities (including activities at the Brookfield borrow site in Sutter County). Up to 81 acres of jurisdictional wetlands and waters could be permanently affected. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td>Phase 3 Project</td>
<td>The Phase 3 Project would result in temporary impacts to approximately 1 acre of jurisdictional wetlands and permanent impacts to approximately 19 acres of jurisdictional wetlands. These impacts would result from construction along the Sacramento River east levee, PGCC west levee, NEMDC west levee, new Elkhorn Canal and GGS/Drainage Canal, and construction activities at the borrow sites and along haul roads. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td>Phase 4a Project</td>
<td>One acre of temporary loss of jurisdictional wetlands and waters of the United States would occur. A permanent loss of 7–10 acres of jurisdictional wetlands and waters of the United States would occur as a result of fill of agricultural ditches and borrow activities. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td>Biological Resources: Vegetation and Wildlife</td>
<td>Phase 1 Project</td>
</tr>
<tr>
<td>Phase 2 Project</td>
<td>Levee improvements would require SAFCA to acquire additional land for maintenance activities and to prevent encroachment along the flood damage reduction facilities. Beneficial effects would include creation of approximately 30 acres of woodland habitat that would likely be planted along landside corridors, and acquisition by SAFCA of approximately 16 acres of existing woodland for preservation in public ownership.</td>
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<tr>
<td>Issue Area</td>
<td>Summary of Environmental Impact</td>
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<tr>
<td>However, new woodland plantings would not mature for several years, and its near-term value as cover would therefore be limited when compared with the value of the existing landside woodland corridor along the Sacramento River east levee. This impact is considered significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.</td>
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<tr>
<td><strong>Phase 3 Project</strong></td>
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<tr>
<td>The Phase 3 Project would remove as much as 34 acres of landside woodland habitat and less than 2 acres of waterside woodland habitat in Reach B:5A–9B of the Sacramento River east levee. Loss of woodland habitat would be offset by creating or preserving approximately 21 acres of woodland habitat along corridors on the landside of the adjacent levee along the Sacramento River in the Phase 3 Project footprint. These compensatory measures would complement woodland preservation and creation activities carried out as part of the Phase 2 Project. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level in the long term, however the impact would be significant and unavoidable in the near term (10–15 years).</td>
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<tr>
<td><strong>Phase 4a Project</strong></td>
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<tr>
<td>The Phase 4a Project would remove as much as 34 acres of landside woodland habitat in Reach B:10–15 of the Sacramento River east levee. Loss of woodland habitat would be offset by creating or preserving up to 58 acres of woodland habitat along corridors on the landside of the adjacent levee along the Sacramento River in the Phase 4a Project footprint. These compensatory measures would complement woodland preservation and creation activities carried out as part of the Phase 2 and 3 Projects. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to a less-than-significant level in the long term, however the impact would be significant and unavoidable in the near term (10–15 years).</td>
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<tr>
<td><strong>Biological Resources: Special-Status Terrestrial Species</strong></td>
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<tr>
<td>Phase 1 Project</td>
<td>Four special-status plant species have potential to occur adjacent to the Phase 1 Project site in freshwater marsh habitat within the NCC, TNBC reserves, and ditches and canals. However, these aquatic habitats would not be affected by project construction.</td>
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<td>Aquatic habitats on and adjacent to the Phase 1 Project site that function as potential feeding, breeding, and rearing habitat for northwestern pond turtles would not be affected. Upland habitat in which project activity would occur is not suitable for nesting pond turtles. Therefore potential impacts to turtle habitat would be minimal, and direct effects to individual turtles are unlikely to occur.</td>
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<tr>
<td></td>
<td>Ditches and canals, rice fields, and managed marsh adjacent to the Phase 1 Project site provide important aquatic habitat for giant garter snakes. Suitable upland adjacent to these aquatic habitats is very limited, and, in some areas, is almost exclusively provided by levee slopes and maintenance corridors. Project implementation would not affect any portion of the TNBC reserves or ditches and canals adjacent to the project site. Therefore, there would be no disturbance or loss of aquatic habitat. Construction activity would, however, occur in uplands within 200 feet of these aquatic habitats, resulting in temporary disturbance of potential basking and overwintering habitat for the snake. Construction activities could also result in direct disturbance and loss of individual giant garter snakes. This impact is considered significant.</td>
</tr>
<tr>
<td></td>
<td>Suitable Swainson’s hawk foraging habitat provided by ruderal vegetation along the levee slope and adjacent landside corridor would be disturbed during project construction. However, these effects would be temporary in nature and restricted to a relatively small area. A small number of trees that could provide suitable nest sites may require removal. These effects to foraging habitat and potential nest trees are unlikely to have a substantial adverse effect on Swainson’s hawks. Construction activities could, however, result in disturbance of nesting Swainson’s hawks, potentially...</td>
</tr>
</tbody>
</table>
Table 4.18-2  
Summary of Phase 1, 2, 3, and 4a Projects’ Impacts (Proposed Action)

<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Summary of Environmental Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>resulting in nest abandonment and loss of active nests. This impact is considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.</td>
</tr>
<tr>
<td><strong>Phase 2, 3, and 4a Projects</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levee improvement activities could adversely affect habitat for special-status species (rose mallow, special-status birds, Delta tule pea, and Sanford’s arrowhead), elderberry, giant garter snake, and the Northwestern pond turtle. These impacts are considered significant.</td>
</tr>
<tr>
<td></td>
<td>The Phase 2, 3, and 4a Projects would support attainment of the NBHCP’s goals and objectives by creating and preserving habitat and creating a valuable aquatic corridor linking TNBC reserves in the northern and southern portions of the Natomas Basin. However, the potential for these project phases to threaten the viability of populations of certain covered species, reduce the effectiveness of the NBHCP’s conservation strategy, and adversely affect attainment of the goals and objectives of the NBHCP could jeopardize successful implementation of the NBHCP. This impact is considered significant.</td>
</tr>
<tr>
<td></td>
<td>The Phase 2, 3, and 4a Projects would not result in the development of land outside the NBHCP permit area, but would result in land use conversions. Land use conversion, however, would not cause a net loss in the habitat values provided by these lands for NBHCP-covered species in the Natomas Basin. Habitat creation and preservation associated with these projects would result in an increase in overall habitat quality, which is anticipated to compensate for the loss associated with land conversions. However, if habitat creation and preservation are not effectively implemented to provide woodland habitat for Swainson’s hawk or other special-status species, an overall adverse effect could occur. These impacts are considered significant.</td>
</tr>
<tr>
<td></td>
<td>With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>Modification of the NCC levee, which is a contributing element of the RD 1000 Rural Historic Landscape District and is a documented historic resource, could alter the integrity of the resource. Modern agricultural cultivation of the Sacramento Valley floodplains and riverbanks has destroyed many prehistoric occupation sites, and the remains of these sites are thus no longer easily visible above ground. During project construction activities, previously undiscovered cultural resources, including Native American traditional cultural properties, may be discovered and disturbed. SAFCA is required under the programmatic agreement to complete an inventory of cultural resources before each project phase. Identified resources will be evaluated for NRHP eligibility, and SAFCA will make a finding of effect, in consultation with USACE and the SHPO. If adverse effects on historic properties are identified, SAFCA must prepare a historic properties treatment plan. This plan specifies actions that SAFCA will take to resolve adverse effects on a historic property or a set of historic properties. The programmatic agreement also requires SAFCA to prepare and submit a plan before construction for responding to inadvertent discoveries.</td>
</tr>
<tr>
<td>Paleontological Resources</td>
<td>The potential exists for unique paleontological resources to be encountered in excavation at depths of 10 feet or more. Deep excavation, associated mainly with cutoff wall construction and borrow activity in construction of the Phase 1, 2, 3, and 4a Projects, could destroy unique paleontological resources. Because of this potential, this impact is considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.</td>
</tr>
<tr>
<td>Issue Area</td>
<td>Summary of Environmental Impact</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Transportation and Circulation</td>
<td>The Phase 1, 2, 3, and 4a Projects would temporarily increase traffic on local roadways, potentially causing congestion on local roads during peak hours. Temporary road closures would contribute to congestion on local roads. Increased traffic, including use of roadways by heavy trucks, along with road closures would cause a temporary increase in hazards on local roadways. Increased congestion and road closures would also have a temporary effect on emergency service response times. These impacts are considered significant. With the implementation of mitigation measures these significant impacts would be reduced to less-than-significant levels.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Construction of the Phase 1, 2, 3, and 4a Projects would result in temporary and short-term generation of ROG, NOX, and PM$<em>{10}$ emissions from excavation, vegetation clearing, grading, borrow material hauling, and other construction activities. Control measures would be implemented to reduce these emissions below the Federal <em>de minimis</em> thresholds (however, a conformity determination is being prepared for the Phase 4a Project). None of the project phases would cause long-term changes in these emissions or expose sensitive receptors to toxic air contaminants. Because maximum construction emissions of ROG, NOX, and PM$</em>{10}$ would exceed local air management districts’ thresholds and would contribute to existing nonattainment conditions in the Sacramento Valley Air Basin, this impact is considered significant. With the implementation of mitigation measures these impacts would remain significant and unavoidable.</td>
</tr>
<tr>
<td>Noise</td>
<td>Construction of the Phase 1, 2, 3, and 4a Projects would result in generation of temporary and short-term construction noise along the Sacramento River east levee, NCC south levee, PGCC west levee, and NEMDC west levee. Noise control measures would be implemented, but operation of earth-moving equipment in the vicinity of noise-sensitive land uses, primarily residences, would exceed local exterior and interior noise standards. Cutoff wall construction and well drilling operations that occur 24 hours per day, seven days per week (24/7) would cause disturbance during more noise-sensitive early morning and nighttime hours. Residents would also be exposed to higher noise levels from increased traffic caused by truck hauling. Some residents would be exposed to temporary groundborne vibrations caused by pile driving where pumping plants are being modified. Even with the implementation of mitigation measures the impact would remain significant and unavoidable.</td>
</tr>
<tr>
<td>Recreation</td>
<td>Project construction could adversely affect recreation if boating is substantially restricted and/or construction noise substantially adversely affects the recreational experience of boaters along the Sacramento River. Although these temporary disturbances may affect the recreation experience for boaters, any such disturbance would be limited and can be relocated within the vicinity. For these reasons, this impact would be less than significant.</td>
</tr>
<tr>
<td>Phase 2 and 3 Projects</td>
<td>Construction of the Phase 3 Project would temporarily affect access to recreation facilities along the Sacramento River, such as marinas, as well as the Teal Bend Golf Club. Although temporary closure of sections of Garden Highway would be an inconvenience for recreationists, other travel routes would be available and could be used to access recreational facilities during the construction period. The quality of recreational opportunities is likely to be somewhat temporarily reduced in the vicinity of the Phase 2 and 3 Projects as a result of noise and visual disturbance from temporary noise and visual disturbance from temporary noise and visual disturbance from temporary...</td>
</tr>
<tr>
<td>Issue Area</td>
<td>Summary of Environmental Impact</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td><strong>Visual Resources</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Phase 1 Project</strong></td>
<td>Project construction activities could temporarily reduce the aesthetic qualities of the project area by introducing earthmoving equipment and other construction equipment, materials, and work crews into views. However, all changes would be temporary while construction is ongoing, and most construction activities would be distant and/or shielded from most viewers. For these reasons, this impact would be less than significant.</td>
</tr>
<tr>
<td><strong>Phase 2, 3, and 4a Projects</strong></td>
<td>The visual character of the Phase 2, 3, and 4a Project areas would be temporarily degraded by the presence and movement of heavy construction equipment. Under the Phase 3 and 4a Projects, a temporary but substantial source of light and glare would be created by 24/7 construction of cutoff walls along the Sacramento River east levee, NCC south levee, PGCC west levee, and NEMDC west levee; and 24-hours-per-day well drilling operations along the Sacramento River east levee. Changes in levee dimensions would not likely be noticeable; however, the removal of large, mature trees in scattered locations along the landside of the Sacramento River east levee would result in a substantial degradation in visual quality for several years until replacement trees in oak woodland planting areas have matured (approximately 10–15 years for some species, up to 100 years for oaks). No feasible mitigation is available to reduce the impact to a less-than-significant level in the near term. Therefore, the impact would remain significant and unavoidable.</td>
</tr>
<tr>
<td><strong>Hazards and Hazardous Materials</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Phase 1 Project</strong></td>
<td>Project construction would involve the storage, use, and transport of hazardous materials at the project site during construction activities. Compliance with federal, state, and local hazardous materials regulations would ensure the appropriate use, transport, and storage of hazardous materials during construction. Hazardous materials may be present at the RD 1001 borrow site and may result in the potential creation of a public health or environmental hazard. Therefore, this potential impact would be significant. With the implementation of mitigation measures this impact would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td><strong>Phase 2 Project</strong></td>
<td>No hazardous materials have been identified within the Phase 2 Project construction footprint or at borrow sites and the Phase 2 Project would not cause any significant hazards associated with the transport and handling of hazardous materials. Construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels, oils and lubricants, and cleaners commonly used in construction projects. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td><strong>Phase 3 and 4a Projects</strong></td>
<td>No significant hazards associated with the transport and handling of hazardous materials would result from construction of the Phase 3 Project. Construction and maintenance activities would involve the use of potentially hazardous materials, such as fuels, oils and lubricants, and cleaners</td>
</tr>
<tr>
<td>Issue Area</td>
<td>Summary of Environmental Impact</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Utilities and Service Systems</td>
<td><strong>Phase 1 Project</strong>&lt;br&gt;No natural gas transmission lines, aerial or underground telephone lines, or underground cable lines are located in the project area, and there would be no impacts on these facilities. Project construction would not require relocation of or modifications to PG&amp;E overhead power lines in NCC Reach D:3 and is not expected to disrupt electrical service. This impact would be less than significant. <strong>Phase 2, 3, and 4a Projects</strong>&lt;br&gt;The Phase 2, 3, and 4a Projects would involve relocation of irrigation facilities, including canals, wells, and pumps, as part of construction of levee improvements along the Sacramento River east levee and NCC south levee, along with replacement of the Elkhorn and Riverside Canals. Significant temporary interruptions of irrigation supply could occur if irrigation infrastructure is damaged during relocation. Power poles carrying electrical distribution and telephone lines would be relocated to make way for expansion of the levee along the landside of the Sacramento River east levee. Construction activities could damage identified and unidentified public utility infrastructure, resulting in temporary interruptions of service in the western Natomas Basin. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td>Airport Safety</td>
<td><strong>Phase 1 Project</strong>&lt;br&gt;The Phase 1 Project area is outside of the Airport Critical Zone (Perimeter B) and the 5-mile buffer area, therefore no impacts to airport safety would occur. <strong>Phase 2, 3, and 4a Projects</strong>&lt;br&gt;Implementation of the Phase 2, 3, and 4a Projects would reduce hazardous wildlife attractants within the Airport Critical Zone (Perimeter B) by improving drainage on the Airport north bufferlands. Levee construction within Reaches C:4A–4B and B:5A–11A of the Sacramento River east levee would take place within the Airport Critical Zone (Perimeter B). Extensive night lighting of construction work and security lighting of construction staging areas at night could interfere with nighttime aircraft landing operations and create a safety hazard related to aircraft landings. Coordination with the Sacramento County Airport System would minimize safety hazards related to potential nighttime interference with aircraft landings. This potential impact is considered significant. With the implementation of mitigation measures the impact would be reduced to a less-than-significant level.</td>
</tr>
<tr>
<td>Wildfire Hazards</td>
<td><strong>Phase 1 Project</strong>&lt;br&gt;According to the California Department of Forestry and Fire Protection’s Fire Resource Assessment Program, the majority of Sutter County and the project site is located in a “non flammable” zone for wildland fires. No Very High Fire Hazard Severity Zones are located in or near Sutter County. In addition, Sutter County is not in a State Responsibility Area.</td>
</tr>
</tbody>
</table>
**Table 4.18-2**  
Summary of Phase 1, 2, 3, and 4a Projects’ Impacts (Proposed Action)

<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Summary of Environmental Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 2, 3, and 4a Projects</strong></td>
<td>Although the Phase 2, 3, and 4a Project areas are located in either a “nonflammable” or “moderate” zones for wildland fires, the project components would take place in locations where physical and weather conditions could combine to lead to a high risk of fire hazard. Construction equipment or construction practices could ignite fires that may result in wildland fires and expose people or structures to a significant risk of loss, injury, or death. This impact is considered significant. With the implementation of mitigation measures these impacts would be reduced to less-than-significant levels.</td>
</tr>
<tr>
<td><strong>Environmental Justice</strong></td>
<td>The Phase 1, 2, 3, and 4a Projects would incrementally reduce the risk of flooding to existing residential, commercial, and industrial development in the Natomas Basin. Although there are low-income and minority populations present in a portion of the project areas, the flood damage reduction benefits of the project phases would accrue to all segments of the population in the Natomas Basin. Any potential environmental impacts on low-income and minority neighborhoods would be the same types of impacts experienced throughout the project areas (e.g., primarily temporary exposure to construction noise, dust, and light and glare during construction), and no permanent residential relocations would occur in low-income areas or areas with high minority populations.</td>
</tr>
</tbody>
</table>

**Notes:** AEP = annual exceedance probability; Airport = Sacramento International Airport; GGS/Drainage Canal = new canal designed to provide drainage and associated giant garter snake habitat; NBHC = Natomas Basin Habitat Conservation Plan; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NOX = oxides of nitrogen; NRHP = National Register of Historic Places; PGCC = Pleasant Grove Creek Canal; PM10 = respirable particulate matter; RD = Reclamation District; ROG = reactive organic gases; SAFCA = Sacramento Area Flood Control Agency; SHPO = State Historic Preservation Officer; TNBC = The Natomas Basin Conservancy; USACE = U.S. Army Corps of Engineers  
Source: Data compiled by AECOM in 2009
<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Phase 1 Project</th>
<th>Phase 2 Project</th>
<th>Phase 3 Project</th>
<th>Phase 4a Project</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Permanent Conversion of Important Farmland</td>
<td>N/A</td>
<td>180 acres</td>
<td>374.5 acres</td>
<td>676 acres</td>
<td>1,230.5 acres</td>
</tr>
<tr>
<td>Potential Permanent Habitat Loss⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>N/A</td>
<td>25 acres</td>
<td>45 (23) acres</td>
<td>1 (1.84) acre</td>
<td>71 (49.84) acres</td>
</tr>
<tr>
<td>Canals</td>
<td>N/A</td>
<td>1.875 (2) acres</td>
<td>16 (13.18) acres</td>
<td>6 (4.87) acres</td>
<td>23.875 (20.05) acres</td>
</tr>
<tr>
<td>Landside woodlands</td>
<td>N/A</td>
<td>19.71 (10.3) acres</td>
<td>37 (33.95) acres</td>
<td>18 (33.78) acres</td>
<td>74.71 (78.03) acres</td>
</tr>
<tr>
<td>Waterside woodlands</td>
<td>N/A</td>
<td>&lt;1 acre</td>
<td>1 (1.39) acre</td>
<td>N/A</td>
<td>&lt;2 (&lt;2.39) acres</td>
</tr>
<tr>
<td>Cropland</td>
<td>N/A</td>
<td>140 (145.5) acres</td>
<td>115 (117.84) acres</td>
<td>473 (304.78) acres</td>
<td>728 (568.12) acres</td>
</tr>
<tr>
<td>Grasslands</td>
<td>N/A</td>
<td>152.09 (139.6) acres</td>
<td>69 (64.12) acres</td>
<td>66 (54.39) acres</td>
<td>287.09 (258.11) acres</td>
</tr>
<tr>
<td>Shaded riverine aquatic habitat</td>
<td>N/A</td>
<td>&lt;1 acre</td>
<td>1 acre</td>
<td>4 (2.59) acres</td>
<td>&lt;6 (&lt;4.59) acres</td>
</tr>
<tr>
<td>Loss of elderberry shrubs</td>
<td>N/A</td>
<td>23 shrubs on Sacramento River east levee (landside)</td>
<td>63 shrubs</td>
<td>surveys in progress</td>
<td></td>
</tr>
<tr>
<td>Potential Wetlands Filled⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary</td>
<td>N/A (0.07 acre)</td>
<td>16.42 (16.81) acres</td>
<td>28.04–33.04 acres</td>
<td>19.76 (7–10) acres</td>
<td>419.42–703.01 acres</td>
</tr>
<tr>
<td>Permanent</td>
<td></td>
<td>348 (69.58) acres</td>
<td>70.42–354.01 (1) acres</td>
<td>1 acre</td>
<td>(71.58) acres</td>
</tr>
<tr>
<td>Potential Temporary Traffic Increases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natomas Cross Canal south levee</td>
<td>240 trips/day</td>
<td>90 trips/day</td>
<td>N/A</td>
<td>20 trips/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>Sacramento River east levee</td>
<td>N/A</td>
<td>950–1,200 trips/day</td>
<td>950–1,000 trips/day</td>
<td>2,200 trips/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>Pleasant Grove Creek Canal west levee</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Not additive</td>
</tr>
<tr>
<td>Potential Construction-Related Road Closures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-month closure of Garden Highway between West Catlett Road and Riego Road</td>
<td>Temporary closures of State Route 99 and lane closures on Garden Highway</td>
<td>Temporary/intermittent closure of approximately 1,000 feet of Garden Highway for approximately 8–12 weeks; temporary closure of Garden Highway at RD 1000 pumping station for removal and replacement of outfall pipes</td>
<td>Temporary/intermittent closure of approximately 1,000 feet of one lane and 1,200 feet of both lanes of Garden Highway for approximately 8–12 weeks; closure of Garden Highway (to through traffic) at three locations for up to 60 days; detours required</td>
<td>Not additive</td>
<td></td>
</tr>
</tbody>
</table>
# Table 4.18-3
Summary of Quantifiable Environmental Impacts Identified in Previous Environmental Documents for the Natomas Levee Improvement Program Landside Improvements Project Phase 1–4a Projects

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Phase 1 Project</th>
<th>Phase 2 Project</th>
<th>Phase 3 Project</th>
<th>Phase 4a Project</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Temporary Air Pollutant Emissions&lt;sup&gt;5&lt;/sup&gt;</td>
<td>Sacramento County:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROG</td>
<td>N/A</td>
<td>96/83 lb/day</td>
<td>75 lb/day</td>
<td>287.6 lb/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>NO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>N/A</td>
<td>437/379 lb/day</td>
<td>413 lb/day</td>
<td>1,476.8 lb/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>PM&lt;sub&gt;10&lt;/sub&gt;</td>
<td>N/A</td>
<td>1,444/1,461 lb/day</td>
<td>971 lb/day</td>
<td>3,846.9 lb/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>Sutter County:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROG</td>
<td>34 lb/day</td>
<td>138/218 lb/day</td>
<td>93 lb/day</td>
<td>101.7 lb/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>NO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>226 lb/day</td>
<td>729/1,139 lb/day</td>
<td>499 lb/day</td>
<td>527.0 lb/day</td>
<td>Not additive</td>
</tr>
<tr>
<td>PM&lt;sub&gt;10&lt;/sub&gt;</td>
<td>80 lb/day</td>
<td>2,162/6,478 lb/day</td>
<td>1,283 lb/day</td>
<td>1,259.5 lb/day</td>
<td>Not additive</td>
</tr>
</tbody>
</table>

Notes: N/A = not applicable; ROG = reactive organic gases; NO<sub>x</sub> = oxides of nitrogen; PM<sub>10</sub> = respirable particulate matter less than 10 microns in diameter; lb/day = pounds per day

<sup>1</sup> All values are approximate. Refer to the respective environmental documents for more detail including significance criteria, mitigation measures, and other aspects of the environmental analysis. Some quantifiable environmental impacts are not presented in this table because there is no significant difference between the impacts, or data are not quantifiable.

<sup>2</sup> Estimates include those originally identified in the Phase 2 EIR and EIS, and the subsequent Phase 2 SEIR, 1<sup>st</sup> Addendum to the Phase 2 EIR, and 2<sup>nd</sup> Addendum to the Phase 2 EIR.

<sup>3</sup> Estimates include those originally identified in the Phase 3 EIS and EIR, and the subsequent Addendum to the Phase 3 EIR.

<sup>4</sup> For some potential habitat and wetland impacts, estimates have been refined based on permit applications and consultation with resource agencies. These estimates are presented in parentheses and are based on the following sources: (1) for the Phase 1 Project, refined estimates are derived from the Clean Water Act Section 401 Water Quality Certification application submitted to the Central Valley Regional Water Quality Control Board on March 6, 2007; (2) for the Phase 2 Project, refined estimates are derived from the Phase 2 Final Biological Assessment dated May 2008 and the Request for Modification of the Phase 2 Section 404 Individual Permit (SPK-2007-0211) dated November 25, 2009; (3) for the Phase 3 Project, refined estimates are derived from the Phase 3 Final Biological Assessment dated March 2009, Amendment No. 2 to the Phase 3a Section 404 Individual Permit Application (SPK 2009-00513) dated August 31, 2009, and Phase 3b Request for Authorization Under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act dated October 8, 2009; and (4) for the Phase 4a Project, refined estimates are derived from the Phase 4a Draft Biological Assessment dated December 2009 and Phase 4a preliminary permit application (ENG Form 4345) Attachment A.

<sup>5</sup> For potential temporary air pollutant emissions, where two values are shown in a cell, the first represents the worst-case daily emissions during either the 2008 or 2009 calendar year, assuming that approximately 60% of the Sacramento River east levee improvements, including those in Reaches C:4A and C:4B, would be performed in a 3-month construction period in 2008, while the remaining 40% would be performed in a 6-month construction period in 2009. The second value represents the worst-case daily emissions if all of the levee improvements planned for the 2008 construction year were to be delayed until the 2009 calendar year and would be performed in a 6-month period.

Source: Data compiled by AECOM in 2009
4.18.4 SUMMARY OF PHASE 1–4a PROJECTS’ MITIGATION

Appendix B4 contains a summary (in tabular form) of the mitigation measures contained in each of the above-listed certified/approved environmental documents and adopted in connection with the Phase 1–4a Projects. The mitigation measures contained in Appendix B4 are provided as presented in the Phase 4a EIS and EIR because the Phase 4a EIS and EIR contain the most up-to-date mitigation commitments. It is important to note that although the mitigation commitments may apply to more than just the Phase 4a Project, the mitigation language has evolved with each certified and approved document, as new information becomes available, as more refined engineering and design details are available for each project phase, from lessons learned in the field (primarily from Phase 2 Project construction) about more effective techniques, and from ongoing coordination and consultation with regulatory agencies. Although the mitigation language has been modified in some of the mitigation measures, the essence of the mitigation commitment has remained the same, but has been enhanced and/or refined. The mitigation measure summary contains each mitigation commitment and to which project phase(s) the mitigation applies. The mitigation summary is provided in an appendix because it is too voluminous for inclusion in the main EIS/EIR volume.

4.18.5 SUMMARY OF PHASE 1–4a PROJECTS’ SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

The following impacts that were identified as significant and unavoidable after implementation of mitigation in the relevant documents are incorporated by reference:

► conversion of Important Farmland to nonagricultural uses (Phase 2, 3, and 4a Projects);
► conflicts with lands under Williamson Act contracts (Phase 3 and 4a Projects);
► potential to temporarily physically divide or disrupt an established community (Phase 3 and 4a Projects);
► potential loss of mineral resources (Phase 4a Project);
► loss of woodland habitats (10–15 years until maturity) (Phase 4a Project);
► impacts on Swainson’s hawk and other special-status birds (Phase 3 and 4a Projects);
► potential construction impacts on known prehistoric resources, discovery of human remains during construction, and damage to or destruction of previously undiscovered cultural resources (Phase 2, 3, and 4a Projects);
► temporary increase in traffic on local roadways during construction (Phase 2, 3, and 4a Projects);
► temporary emissions of reactive organic gases (ROG), oxides of nitrogen (NOX), and respirable particulate matter less than 10 microns in diameter (PM10) during construction (Phase 2, 3, and 4a Projects);
► generation of temporary, short-term construction noise (Phase 2, 3, and 4a Projects);
► temporary exposure of sensitive receptors to or generation of excessive groundborne vibration or noise (Phase 2 and 3 Projects);
► temporary exposure of residents to increased traffic noise levels from hauling activity (Phase 2, 3, and 4a Projects);
► changes in scenic vistas, scenic resources, and existing visual character of the project area (Phase 2, 3, and 4a Projects); and
► new sources of light and glare that adversely affect views (Phase 3 and 4a Projects).
5 CUMULATIVE AND GROWTH-INDUCING IMPACTS, AND OTHER STATUTORY REQUIREMENTS

5.1 CUMULATIVE IMPACTS

The following analysis includes a summary of the overall cumulative impacts of the Phase 1–4a Projects that were identified in previous environmental documents completed for the NLIP, as well as the analysis of the Phase 4b Project’s cumulative impacts, taken together with other past, present, and probable (i.e., reasonably foreseeable) future projects producing related impacts, as required by NEPA implementing regulations (40 Code of Federal Regulations [CFR] Section 1508.7) and the State CEQA Guidelines (14 California Code of Regulations [CCR] Section 15130). The goal of such an exercise is twofold: first, to determine whether the effects of all such projects would be cumulatively significant; and second, to determine whether the Phase 4b Project individually would cause a “cumulatively considerable” (and thus significant) incremental contribution to any such cumulatively significant impacts. (See the State CEQA Guidelines [CCR Sections 15064(h), 15065(a)(3), 15130(a), 15130(b), and 15355(b)] and Communities for a Better Environment v. California Resources Agency (2002) 103 Cal.App.4th 98, 120.)

The Council on Environmental Quality (CEQ) regulations implementing provisions of NEPA define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR Section 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions over time and differ from indirect impacts (40 CFR Section 1508.8). They are caused by the incremental increase in total environmental effects when the evaluated project is added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can thus arise from causes that are totally unrelated to the project being evaluated, and the analysis of cumulative impacts looks at the life cycle of the effects, not the project at issue.

Cumulative impacts are defined in the State CEQA Guidelines (CCR Section 15355) as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact occurs from “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects (see also CCR Section 15130[a][1]). Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (CCR Section 15355[b]).

Consistent with the State CEQA Guidelines (CCR Section 15130[a]), the following discussion of cumulative impacts focuses on significant and potentially significant cumulative impacts. The State CEQA Guidelines (CCR Section 15130[b]) state that:

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

5.1.1 GEOGRAPHIC SCOPE AND TIMEFRAME

The geographic area that could be affected by the NLIP, including the Phase 4b Project, varies depending on the type of environmental issue being considered. When the project’s impacts are considered in combination with those other past, present, and future projects to identify cumulative impacts, the other projects considered may
also vary depending on the type of environmental effects being assessed. The general geographic area associated with the different environmental impacts of the NLIP, including the Phase 4b Project, defines the boundaries of the area used for compiling the list of projects considered in the cumulative impact analysis. Table 5-1 presents the general geographic areas associated with the different resources addressed in this EIS/EIR.

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Geographic Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Natomas Basin, with regional implications</td>
</tr>
<tr>
<td>Land use</td>
<td>Not applicable, because the only potential impacts on land use from the NLIP relate to possible inconsistency with adopted land use plans and policies, and inconsistency with policies is not cumulative. Land use is not addressed further in this cumulative impact analysis, but see Section 4.3, “Land Use, Socioeconomics, and Population and Housing,” for the Phase 4b Project impact analysis.</td>
</tr>
<tr>
<td>Socioeconomics, and population and housing</td>
<td>Local (population and housing near the project site)</td>
</tr>
<tr>
<td>Geology, soils, and mineral resources</td>
<td>Individual construction sites, soil erosion repair sites, and other ground disturbance sites within the Natomas Basin</td>
</tr>
<tr>
<td>Hydrology</td>
<td>Drainage system on the west and east sides of the Natomas Basin and individual grading sites</td>
</tr>
<tr>
<td>Hydraulics</td>
<td>Sacramento River system in the vicinity of Natomas Basin</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Natomas Basin</td>
</tr>
<tr>
<td>Water quality</td>
<td>Ditches and canals on the west and east sides of the Natomas Basin, with implications for the Sacramento River system in the vicinity of Natomas Basin</td>
</tr>
<tr>
<td>Biological resources</td>
<td></td>
</tr>
<tr>
<td>Woodland habitat and wildlife corridors</td>
<td>Natomas Basin, with regional implications</td>
</tr>
<tr>
<td>Sensitive aquatic habitat</td>
<td>Natomas Basin</td>
</tr>
<tr>
<td>Special-status plant and wildlife species</td>
<td>Natomas Basin, with regional implications</td>
</tr>
<tr>
<td>Fish and aquatic habitats</td>
<td>Habitat at individual waterside improvement sites, with regional implications for species</td>
</tr>
<tr>
<td>Cultural resources</td>
<td>Individual ground disturbance sites, with regional implications</td>
</tr>
<tr>
<td>Paleontological resources</td>
<td>Individual ground disturbance sites within the Natomas Basin</td>
</tr>
<tr>
<td>Transportation and circulation</td>
<td>Roadway network in the Natomas Basin, with regional implications</td>
</tr>
<tr>
<td>Air quality</td>
<td>Regional (FRAQMD and SMAQMD); global for greenhouse gas emissions</td>
</tr>
<tr>
<td>Noise</td>
<td>Immediate vicinity of the individual sites of construction activity</td>
</tr>
<tr>
<td>Recreation</td>
<td>Local (facilities near construction sites)</td>
</tr>
<tr>
<td>Visual resources</td>
<td>Individual levee improvement sites and landscape level</td>
</tr>
<tr>
<td>Utilities and service systems</td>
<td>Local service areas</td>
</tr>
<tr>
<td>Hazards and hazardous materials</td>
<td>Individual construction and other ground disturbance sites</td>
</tr>
<tr>
<td>Airport safety</td>
<td>Airport</td>
</tr>
<tr>
<td>Wildlife hazards</td>
<td>Individual construction sites within the Natomas Basin</td>
</tr>
<tr>
<td>Environmental justice</td>
<td>Natomas Basin and affected Tribe; however, environmental justice is not addressed further in this cumulative impact analysis. See Section 4.17, “Environmental Justice,” for the Phase 4b Project impact analysis.</td>
</tr>
</tbody>
</table>

Notes: Airport = Sacramento International Airport; FRAQMD = Feather River Air Quality Management District; SMAQMD = Sacramento Metropolitan Air Quality Management District

Source: Data compiled by AECOM in 2010
The timeframe for consideration of cumulative impacts is approximately 30 years, generally consistent with the timeframe for buildout of approved and proposed specific plan development projects in the Natomas Basin.

5.1.2 APPROACH TO THE PHASE 4b PROJECT CUMULATIVE IMPACT ANALYSES

The Phase 4b Project cumulative impact analysis incorporates by reference the cumulative impact analyses from previous NLIP environmental documents. Information that was not known at the time of preparation of the earlier documents is also presented in this chapter, as well as any cumulative impacts not previously covered in the earlier documents. The analysis specifically addresses the potential cumulative effects from the overlap of construction of the Phase 3, 4a, and 4b Projects, if it occurs (i.e., a reasonable worst-case scenario). As discussed in Section 5.1.2.3, below, any overlapping construction of these three project phases may increase the severity of an environmental effect in the event that these project phases are constructed simultaneously.

5.1.2.1 NATOMAS LEVEE IMPROVEMENT PROGRAM DOCUMENTS INCORPORATED BY REFERENCE

Because this EIS/EIR provides project-level analysis that is tiered from previous program-level analysis, relevant material from the previous documents (listed below) is incorporated by reference. Incorporation by reference is encouraged by both NEPA (40 CFR Sections 1500.4, 1502.21) and CEQA (CCR Section 15150). Both NEPA and CEQA require citation to and a brief summary of the referenced material, as well as information about the public availability of the incorporated material. CEQA also requires citation to the state identification number of the EIRs cited. The program-level and cumulative impact analyses contained in the following documents are incorporated by reference herein:

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

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

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

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

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

Portions of these documents, where specifically noted, are summarized throughout this EIS/EIR. Printed copies of these documents are available to the public at USACE’s office at 1325 J Street, Sacramento, California and are also available on USACE’s Web site at http://www.spk.usace.army.mil. These documents are also available at SAFCA’s office at 1007 7th Street, 7th Floor, Sacramento, California, during normal business hours, and on SAFCA’s Web site, at http://www.safca.org/Programs_Natomas.html.
The previous NLIP environmental documents listed above included a programmatic and cumulative impact analysis of all NLIP project phases (1–4), including the phase now referred to as the Phase 4b Project. Refer to Chapter 1, “Introduction and Statement of Purpose and Need,” for a summary of each project phase and Table 4.18-1, which presents the proposed components and construction timing of the project phases.

5.1.2.2 POTENTIAL SIMULTANEOUS CONSTRUCTION OF THE PHASE 3, 4a, AND 4b PROJECTS

The Phase 3 Project was analyzed in the Phase 3 EIS and EIR (see Section 1.5.4.3, “Phase 3 Project”), and the Phase 4a Project was analyzed in the Phase 4a EIS and EIR (see Section 1.5.4.4, “Phase 4a Project”). The environmental impacts of the Phase 3 and 4a Projects are summarized in Table 2-1 in Section 2.2.2, “No-Action Alternative—Implementation of Phase 1, 2, 3, and 4a Projects Only.” The Phase 3 and 4a Projects could be constructed on a stand-alone basis, assuming no further action on the balance of the NLIP is taken.

Preliminary construction (canal work, utility relocation, vegetation removal, and demolition of structures) of the Phase 3 Project (known as the Phase 3a Project) began in fall 2009; however, major levee construction (known as the Phase 3b Project) would not begin until 2010, assuming receipt of all required environmental clearances and permits. Portions of the Phase 4a Project could be constructed at the same time as a portion of the Phase 3 Project, if Phase 3 Project construction were to extend into 2011, when Phase 4a Project construction is planned to begin.

Table 5-2 lists and summarizes the impacts that overlapped construction would intensify in the event that the Phase 3 Project (NEMDC South cutoff wall construction) and 50% of the Phase 4a Project are constructed simultaneously, and summarizes the effect of this overlap. The mitigation measures required for each impact identified in the environmental document for each project phase (Phases 1–4a) would be adopted by SAFCA and implemented. The mitigation measures required for the Phase 4b Project would be implemented by either USACE or SAFCA, depending on the ultimate agency constructing the Phase 4b Project. Quantitative analysis of potential air quality impacts resulting from this potential concurrent construction scenario is provided in Section 4.11, “Air Quality.”

5.1.3 RELATED PROJECTS IN THE NATOMAS BASIN

Past, present, and probable future projects are those projects that have already been constructed, are currently under construction, or are in various stages of planning but that have yet to initiate construction. Some of these projects are planned to be under construction during the period in which the Phase 4b Project would be under construction (anticipated 2012–2016), while others are expected to be developed after 2016. These projects are organized into the following five categories, as in the previous environmental documents for the NLIP:

- Natomas Levee Improvement Program,
- other flood damage reduction system improvements,
- Sacramento International Airport Master Plan,
- development projects, and
- utility infrastructure projects.

The related projects included in the previous documents are listed below by category with their current (as of January 2010) approval/construction status. Since preparation of the earlier documents, a few additional related projects have become reasonably foreseeable. Those new projects are described in detail below. Those projects in which there have been no substantial changes are only listed.
<table>
<thead>
<tr>
<th>Phase 4b Project Impact (and Significance Conclusion)</th>
<th>Effect on Impact from Overlapping Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact 4.7-f: Impacts on Swainson’s Hawk and Other Special-Status Birds (Significant and Unavoidable)</td>
<td>Visual and noise disturbance of active nests could be increased where the Phase 3 and 4a Projects are adjacent to each other in Reach B:9B–10 of the Sacramento River east levee. This impact could also occur in the event that Phase 4a Project haul trucks would transport soil material from the Elkhorn Borrow Area south using the landside off-road haul route through the overlap between the Phase 3 and 4a Projects’ construction sites in Reaches B:9B–10 of the Sacramento River east levee. Overlapping construction between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project at the same time that the Novak borrow site is being used to provide soil borrow for the Phase 4a Project in Reach B:10–15. This could potentially add to each phase’s traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site, and cause visual and noise disturbance of active nests in Sacramento River east levee Reach B:12. The potential effects on nesting of special-status birds from overlapping construction are speculative in nature, but this possible occurrence would tend to intensify this impact.</td>
</tr>
<tr>
<td>Impact 4.7-h: Impacts on Northwestern Pond Turtle and Burrowing Owl (Less than Significant with Mitigation Incorporated)</td>
<td>Same as above for Impact 4.7-f.</td>
</tr>
<tr>
<td>Impact 4.10-a: Temporary and Short-term Increases in Traffic on Local Roadways (Significant and Unavoidable)</td>
<td>The Phase 4a and 4b Projects would primarily use different borrow sites; however, some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other’s traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site.</td>
</tr>
<tr>
<td>Impact 4.10-c: Temporary and Short-term Disruption of Emergency Service Response Times and Access (Less than Significant with Mitigation Incorporated)</td>
<td>For the Phase 4b Project, Garden Highway would be closed to through traffic south of San Juan Road. However, this closure would not be expected to affect residents north of San Juan Road because emergency vehicles would reach them either via San Juan Road, Del Paso Road, or I-5. Overlap of the Phase 4a and 4b Projects’ construction-related temporary road closures in 2012 could result in temporary increases in traffic levels as traffic is detoured or slowed on some local roadways, potentially interfering emergency access and evacuation routes. The extent and intensity of project construction activities may affect access for emergency services.</td>
</tr>
<tr>
<td>Impact 4.11-a: Temporary Emissions of ROG, NOX, and PM_{10} during Construction (Significant and Unavoidable)</td>
<td>The combination of construction equipment from the Phase 3, 4a, and 4b Projects operating simultaneously would generate greater total emissions compared to the emissions generated by construction of a single Phase 3, 4a, or 4b Project. See Section 4.11, “Air Quality,” for quantitative analysis.</td>
</tr>
<tr>
<td>Impact 4.11-b: General Conformity with the Applicable Air Quality Plan (Less than Significant)</td>
<td>Construction-generated emissions were estimated under the worst-case assumption that portions of the Phase 3 and 4a Projects would overlap with the Phase 4b Project during 2012. See Section 4.11, “Air Quality,” for quantitative analysis.</td>
</tr>
</tbody>
</table>
### Table 5-2

#### Summary of Impacts of Overlapping Construction of the Phase 3, 4a, and 4b Projects

<table>
<thead>
<tr>
<th>Phase 4b Project Impact (and Significance Conclusion)</th>
<th>Effect on Impact from Overlapping Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact 4.12-c: Temporary and Short-term Exposure of Residents to Increased Traffic Noise Levels from Truck Hauling Associated With Borrow Activity (Significant and Unavoidable for exterior residential noise standards)</td>
<td>The Phase 4a and 4b Projects would primarily use different borrow sites; however, some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other’s traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site. Most sensitive noise receptors in this area, however, are located on the opposite side (waterside) of the levee, and would be shielded. Some landside residences would nonetheless be affected.</td>
</tr>
<tr>
<td>Impact 4.14-a Potential Temporary Disruption of Irrigation Water Supply and Impact 4.14-b Potential Disruption of Utility Service (Less than Significant with Mitigation Incorporated)</td>
<td>Detailed project design would include consultation with all known service providers to identify infrastructure locations and appropriate protection measures, and consultation would continue during construction to ensure avoidance/protection of facilities as construction proceeds to minimize service disruptions. The extent and intensity of project construction activities may affect service providers’ abilities to quickly repair damage and/or restore interrupted service.</td>
</tr>
<tr>
<td>Impact 4.16-d: Interference with an Adopted Emergency Evacuation Plan (Less than Significant with Mitigation Incorporated)</td>
<td>For the Phase 4b Project, Garden Highway would be closed to through-traffic south of San Juan Road. However, this closure would not be expected to affect residents north of San Juan Road because emergency vehicles would reach them either via San Juan Road, Del Paso Road, or I-5. Overlap of the Phase 4a and 4b Projects’ construction-related temporary road closures in 2012 could result in temporary increases in traffic levels as traffic is detoured or slowed on some local roadways, potentially interfering with emergency access and evacuation routes. The extent and intensity of project construction activities may affect access for emergency services.</td>
</tr>
</tbody>
</table>

Notes: I-5 = Interstate 5; NOX = oxides of nitrogen; PM10 = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases
Source: Data compiled by AECOM in 2010

### 5.1.3.1 Natomas Levee Improvement Program

The NLIP includes:

- Natomas Cross Canal South Levee Phase 1 Improvements (Phase 1 Project),
- Post-2010 Seepage Remediation projects,
- Bank Protection Project/Erosion Control projects,
- Phase 2 Project,
- Phase 3 Project (includes Phases 3a and 3b),
- Phase 4a Project, and
- Phase 4b Project (the subject of this EIS/EIR).

### 5.1.3.2 Other Flood Damage Reduction System Improvements

Other flood damage reduction system improvement projects were previously addressed in the documents listed in Section 5.1.3:
► SAFCA Levee Integrity Program (specific construction activities are not yet planned, designed, or funded, and their timing is not known),

► California Department of Water Resources/USACE Repairs to Critical Erosion Sites (repairs to more than 100 of the most critical sites [of 250 total] have been completed; two of these sites are along the bank of the Sacramento River east levee between the NCC and the American River, but these improvements do not overlap temporally with construction for the Phase 4b Project), and

► Sacramento County Airport System (SCAS) Management of Land Acquired via the SAFCA/SCAS Land Exchange (approved by SAFCA as part of the Phase 4a Project).

5.1.3.3 Sacramento International Airport Master Plan

The Sacramento International Airport Master Plan (SCAS 2007) is an adopted plan; phases previously addressed in the documents listed in Section 5.1.3 are:

► SMF Master Plan Phase 1 (2007–2013) (currently under construction),
► SMF Master Plan Phase 2 (2014–2020), and
► SMF Master Plan Phase 4a (after 2020).

5.1.3.4 Development Projects

The following development projects were previously addressed in the documents listed in Section 5.1.3:

► Camino Norte Project (annexation hearing anticipated December 2010),
► Greenbriar (annexation completed May 2008),
► Sutter Pointe Specific Plan (EIR certified and specific plan adopted June 2009),
► Metro Airpark Specific Plan (approved plan),
► Natomas Panhandle Annexation (annexation hearing anticipated in summer 2010), and
► West Lakeside Project (the Natomas Unified School District is currently proposing a high school on the site, which is currently under environmental review).

Approved projects listed above are not yet under construction because of the building moratorium in the Natomas Basin.

5.1.3.5 Utility Infrastructure Projects

The following utility infrastructure projects were previously addressed in the documents listed in Section 5.1.3:

► American Basin Fish Screen Habitat Improvement Project (ROD issued April 2009),
► Western Area Power Administration Transmission Line/Sacramento Area Voltage Support Project (in environmental review),
► Placer Parkway Corridor Preservation Project (implementation anticipated by 2020),
Downtown-Natomas-Airport Light Rail Transportation Project (environmental review complete for first segment, construction anticipated to commence in summer 2009),

Sacramento Municipal Utility District Power Line–Elkhorn Substation Capacity Expansion Project (in construction),

Sacramento River Water Reliability Study (on-going), and

Upper (anticipated to be completed in 2010) and Lower Northwest Interceptor Projects (completed).

### 5.1.4 Other Projects Requiring Section 408 Authorization

As described in Chapter 1, “Introduction and Statement of Purpose and Need,” for SAFCA to implement the Phase 4b Project (assuming no Federal participation), SAFCA would request Section 408 permission from USACE to alter a Federal project levee. Table 5-3 identifies the other projects in the Sacramento and San Joaquin River systems where USACE has completed Section 408 authorizations, is currently processing requests for Section 408 authorizations, or expects to receive requests for Section 408 authorizations in the near future.

<table>
<thead>
<tr>
<th>Table 5-3 Other Section 408 Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flood Damage Reduction Project or System</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Approved Section 408 Projects</strong></td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
<tr>
<td><strong>Ongoing Section 408 Projects</strong></td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
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<td>Sacramento River Flood Control Project</td>
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<td>Sacramento River Flood Control Project</td>
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<tr>
<td>Sacramento River Flood Control Project</td>
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<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
<tr>
<td><strong>Anticipated Future Section 408 Projects</strong></td>
</tr>
<tr>
<td>San Joaquin River Flood Control System</td>
</tr>
<tr>
<td>San Joaquin River Flood Control System</td>
</tr>
<tr>
<td>Sacramento River Flood Control Project</td>
</tr>
</tbody>
</table>

Source: Compiled by AECOM in 2010
5.1.5 CUMULATIVE IMPACT ANALYSIS

5.1.5.1 AGRICULTURAL RESOURCES

Phase 1–4a Projects

Implementation of the Phase 1–4a Projects would involve the conversion of large acreages of Important Farmland (Prime Farmland and Farmland of Statewide Importance) to managed marsh and managed grassland at borrow sites, and would entail the conversion of portions of agricultural parcels to nonagricultural uses at levee toe widening, berm, and new canal alignment locations. USACE and SAFCA determined that the conversion of agricultural land that would result from the Phase 1–4a Projects, in combination with the past, current, and probable future conversions of Important Farmland in the Natomas Basin, would be significant and unavoidable because it is not feasible to replace farmland by creating new farmland after it has been converted to nonagricultural uses. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects would result in a cumulatively considerable incremental contribution to the cumulatively significant impact on loss of Important Farmland (Prime Farmland and Farmland of Statewide Importance).

Phase 4b Project

As described in Section 4.2, “Agricultural Resources,” the estimated maximum total of Important Farmland that is expected to be permanently converted would be 705 acres for the Adjacent Levee Alternative (Proposed Action), for a total of approximately 1,455 acres for the entire NLIP.

The Phase 4b Project is expected to result in the conversion of some additional Important Farmland to nonagricultural uses in Sacramento River east levee Reach A:16, along the west levees of NEMDC North and the PGCC, and the south levee of the NCC; as part of several canal relocations; in detention basins that would be created in the Triangle Properties Borrow Area; and as part of conversion of a portion of the Brookfield Borrow Site to managed marsh.

The Natomas Basin has already experienced the conversion of a substantial area of agricultural land, much of it Prime Farmland and other categories of Important Farmland, to residential and commercial development. The Natomas Basin is the focus of much of the growth planning in the Sacramento area, in both Sutter and Sacramento Counties, and substantial losses of Important Farmland to urban development are expected to continue in this area. As noted in Section 3.2.2, “Agricultural Resources,” Important Farmland in the Natomas Basin totaled approximately 40,000 acres in 2006, the last year for which California farmland mapping data are available, representing 6% of the total of approximately 715,000 acres of Important Farmland mapped by the Farmland Mapping and Monitoring Program in Sutter and Sacramento Counties in 2006. Of this amount, approximately half is expected to be converted to developed uses and half maintained in agriculture or in a condition compatible with future agricultural use (i.e., undeveloped) within The Natomas Basin Conservancy parcels, Airport north bufferlands, lands anticipated to be maintained in an undeveloped condition as part of the Joint Vision, and land managed by SAFCA. The loss of an additional approximately 20,000 acres in the Natomas Basin would continue an overall trend of net loss of Important Farmland that has been documented in Sutter and Sacramento Counties for each consecutive 2-year interval of mapping by the California Department of Conservation from 1992 through 2006. As described elsewhere in this EIS/EIR, development of land in the Natomas Basin is consistent with regional land use planning efforts (see Section 5.2, “Growth Inducement”) which promote the concentration of urban growth within the borders of existing cities and their immediate adjacent areas, including the Natomas Basin specifically, and discourage both sprawling development and development expansion into existing nonurbanized floodplains that would result in greater regional conversion of agricultural land to nonagricultural uses. (See Section 5.2, “Growth Inducement”; Section 6.11, “Executive Order 11988, Floodplain Management”; and Section 6.14, “Farmland Protection Policy Act,” for more discussion of this issue.)
Nevertheless, the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would result in the conversion of agricultural land to nonagricultural uses and, in combination with the conversions of Important Farmland in the Natomas Basin associated with past, current, and future projects, would result in a cumulatively considerable incremental contribution to the cumulatively significant impact on loss of Important Farmland (Prime Farmland and Farmland of Statewide Importance).

5.1.5.2 GEOLOGY, SOILS, AND MINERAL RESOURCES

Phase 1–4a Projects

Grading and other earthmoving activities associated with the Phase 1–4a Projects could result in temporary, localized soil erosion and topsoil loss. These site-specific impacts were determined to be less than significant, with implementation of mitigation measures (specifically, construction Best Management Practices [BMPs]), and any residual impacts would not combine with the effects of any other activities. USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

Grading and other earthmoving activities associated with the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative could result in temporary and short-term localized soil erosion and topsoil loss. These site-specific impacts would be less than significant, with implementation of construction BMPs (Mitigation Measure 4.4-a[1]), and any residual impacts are not expected to combine with the effects of any other activities. Each project would implement construction BMPs. Therefore, implementation of the Phase 4b Project and related projects would not result in a cumulatively considerable incremental contribution to a significant cumulative impact on geology and soils because the impact would be temporary, short-term, and soil erosion and loss of topsoil would be localized. Most of the Natomas Basin has been designated MRZ-1, where it has been determined that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence (City of Sacramento 2009b). Some small MRZ-3-designated zones, where the significance of mineral deposits in that area cannot be evaluated from existing data, are located in the northwestern and southeastern parts of the Basin. The West Lakeside borrow site contains a small area zoned MRZ-3, from which borrow material would be excavated, potentially removing economically valuable minerals, if they are present. However, as noted in Impact 4.4-c, “Potential Loss of Mineral Resources,” borrow materials needed for project implementation would be limited to earthen materials (i.e., soils) and would not consist of sediments that would be considered aggregate resources. Therefore, implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative and related projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.3 HYDROLOGY AND HYDRAULICS

Phase 1–4a Projects

The Phase 1–4a Projects would not significantly alter water surface elevations in the project area or in the larger Sacramento River Flood Control Project (SRFCP), or contribute cumulatively to any such alteration. Therefore, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

As discussed in Section 4.5, “Hydrology and Hydraulics,” and in Appendix C1, a hydraulic impact analysis was performed to analyze the cumulative impacts of combining the Phase 4b Project with Federally authorized “early implementation” improvements to Folsom Dam and improvements to the SRFCP’s urban levees aimed at
providing urban areas outside the Natomas Basin with 200-year (0.005 annual exceedance probability [AEP])
flood damage reduction. The Phase 4b Project would not significantly alter water surface elevations in the project
area or in the larger SRFCP, or contribute cumulatively to any such alteration. The widening of levees along the
Sacramento River east levee, raising of levees along the PGCC and NEMDC, modification of irrigation and
drainage infrastructure, and borrow activities on large parcels could interfere with the functioning of local
drainage systems and alter local surface drainage. Project design would incorporate measures to prevent a
significant drainage disruption or alteration in runoff patterns (Mitigation Measure 4.5-b), and any temporary
impacts would be limited to the vicinity of the individual disturbance sites. Each related project that would
discharge stormwater runoff would also be required to comply with NPDES discharge permits from the Central
Valley Regional Water Quality Control Board (RWQCB), which are designed to prevent significant water
quality-related impacts. Therefore, implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-
in-Place Alternative and related projects would not result in a cumulatively considerable incremental
contribution to a cumulatively significant impact.

5.1.5.4 GROUNDWATER

Phase 1–4a Projects

USACE and SAFCA determined that that Phase 1 and 2 Projects would not have a significant effect on
groundwater; however, the Phase 3 and 4a Projects would have the potential to result in significant impacts on
groundwater recharge due to reduced irrigated lands covered by the footprint of the proposed levee improvements,
increased recharge from the proposed canal improvements, and changes to land use and irrigation practices
following excavation of soil and reclamation of the potential borrow sites. Overall, the Phase 3 and 4a Projects
would have a small positive impact on groundwater supplies and storage in the Natomas Basin, and a small
negative impact on groundwater east of the Natomas Basin, based on existing conditions. Overall, the cumulative
impact of the Phase 3 and 4a Projects on future groundwater conditions would be negligible. USACE and SAFCA
further determined that it would be unlikely that related projects would substantially adversely affect groundwater
recharge, although as lands are converted from agricultural use to developed uses, some reduction in groundwater
recharge from deep percolation of irrigation water can be expected. Therefore, USACE and SAFCA determined
that the Phase 3 and 4a Projects would not result in a cumulatively considerable incremental contribution to a
cumulatively significant impact.

Phase 4b Project

The Phase 4b Project’s groundwater impacts are the same for both the Adjacent Levee Alternative (Proposed
Action) and Fix-in-Place Alternative because changes in land uses and potential changes in groundwater recharge
are the same. The evaluation of potential groundwater impacts prepared by Luhdorff & Scalmanini Consulting
Engineers investigated the effects on groundwater from excavation of borrow sites for the Phase 2, 3, and 4a
Projects (see Appendix C2). Excavation and subsequent reclamation of several borrow areas being proposed for
use as part of the Phase 4b Project could have an indirect effect on groundwater conditions if the land use and
existing water supply were to change following reclamation. After reclamation, detention basins/grasslands may
be created at the Triangle Properties Borrow Area, with the remaining acreage returned to agricultural uses. The
creation of detention basins would have a minimal effect on recharge, as the land is currently used for rice
production. Although, the new Phase 4b Project borrow sites would be returned to similar land uses as under pre-
construction conditions which include agriculture, habitat, and open space, deep percolation from irrigated
farmland would decrease somewhat. Alternately, the Phase 4b Project would serve to increase deep percolation
through seepage from canals due to canal improvements. Canal improvements include relocation of the West
Drainage Canal, Riego Road Canal, Vestal Drain ditch, Morrison Canal, and private irrigation and drainage
canals. In addition, groundwater pumping would decrease due to the planned transition to surface water supply at
the Brookfield Borrow Site, 100 acres of which would be converted to managed marsh.
Current groundwater levels in the Phase 4b Project area vary widely, depending upon soil type and subsurface stratigraphy; groundwater levels also vary by season, with higher levels in winter than in summer. The post-reclamation land uses are not expected to significantly change this variability. Overall, there would be an estimated slight net increase of 700 acre feet per year (afy) in groundwater levels and storage in the Natomas Basin for existing conditions. For future (2030) conditions, that increase would be 260 afy. The effect on subsurface outflow to the east would be slightly negative for existing conditions (-80 afy) and slightly positive for future (2030) conditions (60 afy). Therefore, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.5 LOCAL DRAINAGE

Phase 1–4a Projects

The widening of levees and construction of landside seepage berms along the Sacramento River east levee, associated modification of irrigation and drainage infrastructure, and borrow activities on large parcels associated with the Phase 1–4a Projects could interfere with the functioning of local drainage systems and alter local surface drainage. Project design would incorporate measures to prevent a significant drainage disruption or alteration in runoff patterns, and any temporary effects would be limited to the vicinity of the individual disturbance sites. Each related project that would discharge stormwater runoff would also be required to comply with NPDES discharge permits from the Central Valley RWQCB, which are designed to prevent significant water quality-related impacts. Therefore, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

The Phase 4b Project would include widening of levees and construction of landside seepage berms along the Sacramento River east levee, associated modification of irrigation and drainage infrastructure, and borrow activities on large parcels; these activities could interfere with the functioning of drainage systems and alter surface drainage. Project design would incorporate measures to prevent a significant drainage disruption or alteration in runoff patterns, and any temporary effects would be limited to the vicinity of the individual disturbance sites. Each related project that would discharge stormwater runoff would also be required to comply with NPDES discharge permits from the Central Valley RWQCB, which are designed to prevent significant water quality-related impacts. Therefore, the Phase 4b Project would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.6 WATER QUALITY/FISHERIES

Construction activities have the potential to temporarily degrade water quality and fish habitat and populations through the direct release of soil and construction materials into water bodies or the indirect release of contaminants into water bodies through runoff. Related projects, including the extensive array of development projects anticipated in the Natomas Basin and SAFCA’s bank protection projects, would have a similar potential to release materials into watercourses that support fish and other aquatic resources. Potential sedimentation, increased turbidity, or the release and exposure of contaminants could adversely affect fish and aquatic habitats.

Phase 1–4a Projects

For the Phase 1 and 2 Projects, USACE and SAFCA determined that compliance with the regulatory regime, design of features for fish habitat and shaded riverine aquatic (SRA) habitat, and implementation of BMPs and a storm water pollution prevention plan (which would be required for related projects as well) would ensure that
these impacts would be less than significant and would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

For the Phase 3 and 4a Projects, the implementation of BMPs and adherence to the conditions of a storm water pollution prevention plan would ensure that the requirements of the Clean Water Act and Porter-Cologne Water Quality Control Act are met. Given the temporary nature of any impacts and the protections afforded by regulatory programs under the Clean Water Act and Porter-Cologne Water Quality Control Act, any degradation of surface waters by construction activities of the Phase 3 and 4a Projects and related projects would be minimized. Consequently, the potential impacts of project construction are not expected to make a considerable contribution to a significant cumulative impact on water quality, fish or fish habitat, or other aquatic species. Therefore, USACE and SAFCA determined that the Phase 3 and 4a Projects’ Proposed Actions, as well as the Phase 1 and 2 Projects, would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Under the Levee Raise-in-Place (Phase 3 Project) and the Raise and Strengthen Levee in Place (RSLIP) (Phase 4a Project) Alternatives, however, removal of woody vegetation from the waterside of the Sacramento River east levee to conform with USACE guidance regarding levee encroachments could have a substantial effect on SRA habitat along this levee. The loss of SRA habitat along the Sacramento River and reduction in input of woody debris associated with this removal could be a significant contribution to an already substantial historical loss of SRA habitat and woody debris; it is unknown whether adequate mitigation could be provided to compensate for this impact. Given these circumstances, USACE and SAFCA determined that the Levee Raise-in-Place and RSLIP Alternatives could result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to loss of SRA habitat and woody debris.

**Phase 4b Project: Water Quality**

Under the Phase 4b Project, the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would involve essentially the same construction activities and differ only in that under the Fix-in-Place Alternative, the Sacramento River east levee (Reach A:16–20) would not be widened to the landside to as great an extent. The implementation of BMPs and adherence to the conditions of a storm water pollution prevention plan (Mitigation Measures 4.6-a and 4.6-b) would ensure that the requirements of the Clean Water Act and Porter-Cologne Water Quality Control Act are met. Given the temporary nature of any impacts, and the protections afforded by regulatory programs under the Clean Water Act and Porter-Cologne Water Quality Control Act, any degradation of surface waters by construction activities of the Phase 4b Project and other projects would be required to implement similar measures to prevent and minimize adverse impacts to water quality. Consequently, the Phase 4b Project’s potential construction impacts would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Construction of the Phase 4b Project, combined with previous project phases of the NLIP as well as other land uses changes in the Natomas Basin that would occur through 2030, would result in slight groundwater quality degradation in some areas and improvements in other areas. The primary impact on groundwater quality would be increased salt accumulation in the Natomas Basin resulting from reduced groundwater inflow from the west and north and reduced groundwater outflow to the east of the Natomas Basin (see Appendix C4). These reductions, however, represent a small percentage of the total estimated groundwater inflow and outflow, and the water quality impacts are not expected to be measurable. Therefore, the Phase 4b Project’s potential construction impacts on both surface and groundwater quality would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

**Phase 4b Project: Fisheries**

For the Phase 4b Project, vegetation that may provide SRA habitat would be removed to some extent under all alternatives. As noted in Section 3.7.2.1, under “Fisheries,” modifications of the channels bordering the Natomas
The Adjacent Levee Alternative (Proposed Action) would involve removal of a less than of an acre of SRA habitat for pumping plant modifications and as part of raising the west levee of NEMDC North. A variance would be requested for removal of waterside vegetation (including SRA habitat) along NEMDC South, which would avoid loss of SRA habitat in this area. However, if full compliance with USACE vegetation guidance is required, approximately 11 acres of waterside vegetation (including SRA habitat) would have to be removed from the NEMDC South in a worst-case scenario. The Fix-in-Place Alternative would be similar to the Adjacent Levee Alternative (Proposed Action) in terms of its potential construction-related impacts on habitats that support fish and other aquatic resources; however, because an adjacent levee would not be constructed under the Fix-in-Place Alternative, an estimated 19 acres of vegetation (including SRA habitat) would be required to be removed along the waterside of Sacramento River east levee Reach A:16–20 to comply with USACE vegetation guidance. This would be in addition to the removal of approximately 11 acres of waterside vegetation (including SRA habitat) from the NEMDC South that would be required if a variance is not granted. Mitigation Measure 4.7-a would require replacement of SRA habitat; however, it may not be possible to create enough suitable SRA habitat to compensate for this loss. As noted above, historic channel alterations have resulted in marginal habitat conditions that provide only limited habitat functions for most native fish species and other aquatic organisms. Therefore, combined with these previous channel alterations, the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to loss of SRA habitat and woody debris.

5.1.5.7 SENSITIVE AQUATIC HABITATS

Phase 1–4a Projects

USACE and SAFCA determined that the Phase 1 Project would not have a significant effect on sensitive aquatic habitats; however, the Phase 2, 3, and 4a Projects would include excavation and the placement of fill in sensitive aquatic habitats, resulting in both temporary and permanent effects. With the exception of The Natomas Basin Conservancy (TNBC)-managed lands and Airport mitigation sites that have been developed in the last decade, the overall trend in wetlands and other aquatic habitats within the Natomas Basin is a reduction in acreage and habitat values. Because the Phase 2, 3, and 4a Projects would include the creation of acreages of waters of the United States that are expected to more than offset the filling and dewatering of waters of the United States included in these project phases, and because new jurisdictional habitats would be created and managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost, USACE and SAFCA determined that overall effects of the Phase 2, 3, and 4a Projects would be beneficial. Therefore, the Phase 2, 3, and 4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

With the exception of TNBC-managed lands and Airport mitigation sites that have been developed in the last decade, the overall trend in wetlands and other aquatic habitats within the Natomas Basin is a reduction in acreage and habitat functions. As described in the NBHCP, approximately one-fourth to one-fifth of the 53,000-acre Basin contained areas of seasonal open water or riparian scrub historically, as indicated by 1908 mapping. Since 1914, land reclamation and reclamation facilities, canals, levees, and pumping stations have allowed over 80% of the Basin to be converted to agricultural production, with irregular small-scale topographic features of the earlier landscape having largely been eliminated by agriculture. As part of this conversion, the drainage pattern of the Basin was altered to collect runoff into canals, from which the runoff is pumped into the surrounding canals and
Sacramento River. Except on TNBC parcels and other mitigation lands, natural vegetation in the Basin is now primarily found along irrigation canals, drainage ditches, pastures, and uncultivated fields.

The Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would result in permanent impacts to approximately 199 acres and temporary impacts to approximately 324 acres of wetlands and other waters of the United States. Proposed mitigation for these impacts includes the creation of at least 1 acre of irrigation/drainage canal or 1 acre of seasonal wetland for every acre that is lost and/or that irrigation/drainage function shall be replaced (Mitigation Measure 4.7-c). The mitigation ratio that is ultimately required will be determined by USACE through the Section 404 permitting process. Features planned in the Phase 4b Project (under both action alternatives) would provide aquatic habitat that has been designed to offset the effects described above. These features include the creation of up to 100 acres of managed marsh at the Brookfield Borrow Site, much of which would meet the criteria for waters of the United States, including wetlands, or at another site approved by the U.S. Fish and Wildlife Service (USFWS).

Overall, because the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would include the creation of waters of the United States that are expected to be more extensive than those filled by the Phase 4b Project, and because implementing this mitigation measure would ensure that new jurisdictional waters would be managed in a manner that minimizes maintenance disturbance and provides the essential functions of the habitats that would be lost, the Phase 4b Project, with implementation of Mitigation Measure 4.7-c, would be beneficial, and thus would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.8 TERRESTRIAL BIOLOGICAL RESOURCES

Phase 1–4a Projects

Implementation of the Phase 1–4a Projects has the potential to contribute to the loss or degradation of sensitive habitats and to adversely affect special-status terrestrial species (special-status plants, valley elderberry longhorn beetle, giant garter snake, Swainson’s hawk and other nesting raptors, and burrowing owl). These effects could contribute to species declines and losses of habitat that have led to the need to protect these species under the Federal Endangered Species Act (ESA) and California Endangered Species Act (CESA).

Because minimization, avoidance, and compensation measures would be implemented in accordance with the requirements of the ESA, CESA, and other relevant regulatory requirements, and the Phase 1 and 2 Projects would include additional habitat protection and enhancement components, potential adverse effects on other special-status species and on sensitive habitats would be reduced to a less-than-significant level. Similarly, each related project that would adversely affect special-status species would also be required to comply with ESA, CESA, and other regulatory requirements. For these reasons, USACE and SAFCA determined that the Phase 1 and 2 Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Implementation of the Phase 3 and 4a Projects’ Proposed Actions and mitigation measures would ensure that potential adverse impacts on special-status species and sensitive habitats would be reduced or avoided in accordance with the requirements of the ESA, CESA, and other regulatory programs that protect habitats. The Phase 3 and 4a Projects incorporate habitat creation, modification, and preservation components designed to offset the projects’ adverse impacts. In addition, mitigation measures require further development of these habitat improvement components, including preparation and approval of management plans. Successful implementation of these mitigation measures would result in permanent protection and management of giant garter snake habitat, including creation and enhancement of connectivity between giant garter snake populations in the Natomas Basin, which is expected to result in an overall improvement of habitat conditions for giant garter snakes in the Basin. An increase in permanently protected foraging habitat for Swainson’s hawk, eventual long-term increase in
potential nesting habitat, and preservation of existing nest sites would also maintain or improve current conditions for this species in the Natomas Basin. For these reasons, USACE and SAFCA determined that the Phase 3 and 4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Because of its inclusion of erosion control improvements at one site along the Sacramento River east levee, the Levee Raise-in-Place (Phase 3 Project) and RSLIP (Phase 4a Project) Alternatives would involve removal of as much as 22.5 acres and 21 acres, respectively, of riparian woodland on the waterside of the levee. In addition to its overall value as habitat for various species, this woodland supports active Swainson’s hawk nests, elderberry shrubs, and other important biological resources. Adverse impacts on these resources on the waterside of the levee would be more difficult to mitigate than the adverse impacts from the adjacent setback levee footprint on the landside of the levee under the Phase 3 and 4a Projects’ Proposed Actions, and it is uncertain whether adequate compensation could be developed for the extensive loss of mature waterside vegetation under these alternatives. USACE and SAFCA determined that it is possible that the Levee Raise-in-Place and RSLIP Alternatives could result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to the extensive loss (up to 21–22.5 acres) of mature waterside riparian woodland that supports active Swainson’s hawk nests, elderberry shrubs, and other important biological resources.

Phase 4b Project

Implementation of the Phase 4b Project has the potential to contribute to the loss or degradation of sensitive habitats and to adversely affect special-status terrestrial species (special-status plants, valley elderberry longhorn beetle, giant garter snake, northwestern pond turtle, Swainson’s hawk, burrowing owl and other special-status birds, and vernal pool fairy shrimp). Potential impacts of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative related to wildlife would be associated with vegetation removal needed to clear the path for the Phase 4a Project and construction disturbances to wildlife and their habitats, as well as permanent loss of habitat for the affected species. These impacts could contribute to species declines and losses of habitat that have led to the need to protect these species under the Federal ESA and CESA.

Proposed Natomas Central Mutual Water Company (NCMWC) projects, including the Sankey Diversion and Fish Screen Project, would also result in habitat and wildlife disturbances during construction. The Sankey Diversion would include permanent loss of habitat for some special-status species, including giant garter snake, but an appropriate habitat replacement and management plan is being developed in consultation with USFWS and the California Department of Fish and Game (DFG) to provide adequate compensation for the loss. Despite temporary construction-related adverse impacts from the Fish Screen Project, the overall long-term impacts would be beneficial and habitat quality would improve.

The Airport Master Plan includes a number of components that are anticipated to result in adverse impacts on sensitive habitats and special-status species. The majority of these impacts would be associated with Phases 2 and 3 of the Airport Master Plan, which would not commence until 2014, and would include a combination of permanent habitat loss and construction-related impacts. There could also be impacts from expanded long-term operation of the Airport. SCAS has identified some habitat enhancement and protection measures that would be implemented to compensate for adverse impacts, and additional measures are anticipated to be identified as subsequent NEPA/CEQA evaluation and regulatory permitting is completed.

Significant adverse impacts on special-status species and sensitive habitats would be associated with the extensive future urban growth expected to occur in the Natomas Basin. This growth would continue to reduce the amount of habitat available to support special-status species. Potential adverse impacts from future approved expansion within the Basin have been addressed through the development of the NBHCP, and successful implementation of the NBHCP would ensure that there is no overall adverse impact on special-status species from implementation of these projects. Similarly, an HCP is being implemented for the Metro Air Park Project. Additional urban expansion is being promoted through the Joint Vision, which would result in development and open space
conservation within the Sacramento County portion of the Natomas Basin that was not covered in the NBHCP. Potential impacts on biological resources from implementation of this potential future development are at various stages of evaluation. Projects would be required to incorporate adequate impact avoidance and minimization measures and permanent habitat conservation to mitigate and compensate for the anticipated adverse impacts.

The Phase 4b Project impact conclusions on terrestrial biological resources differ between the two action alternatives, and accordingly are described separately below.

**Adjacent Levee Alternative (Proposed Action)**

Implementation of the Adjacent Levee Alternative (Proposed Action) and mitigation measures in Section 4.7, “Biological Resources,” would ensure that the project’s impacts are reduced or avoided in accordance with the requirements of the Federal ESA and CESA and other regulatory programs that protect habitats, such as Section 404 of the Clean Water Act and Section 1602 of the California Fish and Game Code. As discussed in Chapter 2, “Alternatives,” the Phase 4b Project incorporates habitat creation, modification, and preservation components designed to offset the project’s adverse impacts. In addition, mitigation measures require further development of these habitat improvement components, including preparation and approval of management plans. Successful implementation of these mitigation measures would result in permanent protection and management of giant garter snake habitat, including creation and enhancement of connectivity between giant garter snake populations in the Natomas Basin, which is expected to result in an overall improvement of conditions for giant garter snakes in the Basin. An increase in permanently protected foraging habitat for Swainson’s hawk, eventual long-term increase in potential nesting habitat, and preservation of existing nest sites would also maintain or improve current conditions for this species in the Natomas Basin. Moreover, the Adjacent Levee Alternative (Proposed Action) has been designed to support achievement of the goals and objectives of the NBHCP, and implementation of Mitigation Measure 4.7-k would ensure that the Adjacent Levee Alternative (Proposed Action) does not jeopardize successful implementation of the NBHCP.

In summary, the Adjacent Levee Alternative (Proposed Action) would include minimization, avoidance, and compensation measures in accordance with the requirements of ESA, CESA, and other relevant regulatory requirements, as well as additional habitat protection and enhancement components. Therefore, the Adjacent Levee Alternative (Proposed Action) would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

**Fix-in-Place Alternative**

Because of its inclusion of erosion control improvements at five sites along the Sacramento River east levee in Reaches B:10–11B, and to comply with USACE encroachment guidance, the Fix-in-Place Alternative would involve a somewhat different set of impacts to terrestrial biological resources than would the Adjacent Levee Alternative (Proposed Action). The narrower landside levee footprint of the Fix-in-Place Alternative would avoid some losses of woodland and grassland habitat that would be unavoidable under the Adjacent Levee Alternative (Proposed Action); however, under the Fix-in-Place Alternative, as much as 21 acres of riparian woodland on the waterside of the levee in Reaches B:10–15 of the Sacramento River east levee could be removed to conform with USACE guidance regarding levee encroachments. In addition to its overall value as habitat for various species, this woodland supports active Swainson’s hawk nests, elderberry shrubs, and other important biological resources. Adverse impacts on these resources on the waterside of the levee would be more difficult to mitigate than the adverse impacts from the adjacent levee footprint on the landside of the levee under the Adjacent Levee Alternative (Proposed Action), both in terms of the acreage of habitat lost and the quality of that habitat. Implementation of this alternative would include minimization, avoidance, and compensation measures in accordance with the requirements of ESA, CESA, and other relevant regulatory requirements; however, it is uncertain whether adequate compensation could be developed for the extensive loss of mature waterside vegetation under this alternative. Therefore, the Fix-in-Place Alternative would result in a cumulatively considerable incremental contribution to a cumulatively significant impact related to the extensive loss of...
mature waterside riparian woodland that supports active Swainson’s hawk nests, elderberry shrubs, and other important biological resources.

5.1.5.9  **Cultural Resources**

**Phase 1–4a Projects**

Prehistoric human habitation sites are common in riverbank and floodplain areas, and burial sites are often encountered in the course of ground-disturbing activities. It is likely that known or unknown archaeological resources could be disturbed and cultural resources damaged or destroyed during construction activities for the Phase 1–4a Projects. Losses of a unique archaeological resource could occur where excavations encounter archaeological deposits that cannot be removed or recovered (e.g., under levees), or where recovery would not be sufficient to prevent the loss of significance of the cultural materials. Historic resources could also be damaged or require removal from areas near flood damage reduction facilities under the Phase 1–4a Projects. If these resources would be eligible for National Register of Historic Places (NRHP) listing, their modification or destruction would be considered significant. Although mitigation would be implemented to reduce effects on potentially significant cultural resources, adverse effects, particularly on archaeological resources, may still occur. Losses of archaeological resources would add to a historical trend in the loss of these resources as artifacts of cultural significance and as objects of research importance. For these reasons, despite the implementation of mitigation measures, USACE and SAFCA determined that the Phase 1–4a Projects would result in a **cumulatively considerable incremental contribution** to a cumulatively significant impact on archaeological resources, including loss of these resources as artifacts of cultural significance and as objects of research importance.

**Phase 4b Project**

Construction of the Phase 4b Project could disturb known or unknown archaeological resources, and damage or destroy cultural resources. Historic resources could also be damaged or require removal from areas near flood damage reduction facilities; however, USACE and the State Historic Preservation Officer (SHPO) have concurred that most historic resources identified in the Phase 4b Project footprint lack significance that might make them eligible for listing on the NRHP or the California Register of Historic Resources. Although mitigation would be implemented to reduce impacts on potentially significant cultural resources, adverse impacts, particularly on prehistoric archaeological resources, may still occur. Losses of archaeological resources would add to a historical trend in the loss of these resources as artifacts of cultural significance and as objects of research importance. For these reasons, despite the implementation of Mitigation Measures 4.8-b, 4.8-c, and 4.8-d, the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would result in a **cumulatively considerable incremental contribution** to a cumulatively significant impact on archaeological resources, including loss of these resources as artifacts of cultural significance and as objects of research importance.

5.1.5.10  **Paleontological Resources**

**Phase 1–4a Projects**

Earthmoving activities associated with the Phase 1–4a Projects could damage unknown unique paleontological resources, but potential damage would be limited by implementation of mitigation measures, and would be limited to individual resources in discrete locations. There is a low probability that any project (including the Phase 1–4a Projects and related projects) would encounter unique, scientifically-important fossils; if encountered, there would be benefits that would occur from recovery and further study of those fossils. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a **cumulatively considerable incremental contribution** to a cumulatively significant impact.
Phase 4b Project

Under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, earthmoving activities could damage unknown unique paleontological resources, but potential damage would be limited by implementation of Mitigation Measure 4.9-a, and would be limited to individual resources in discrete locations. Because of the low probability that any project would encounter unique, scientifically-important fossils, and the benefits that would occur from recovery and further study of those fossils if encountered, development of the related projects and other development in the region are not considered to result in a cumulatively considerable impact related to paleontological resources. Therefore, the Phase 4b Project and related projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.11 TRANSPORTATION AND CIRCULATION

Phase 1–4a Projects

Impacts of the Phase 1–4a Projects’ construction activities on emergency access would be site-specific, intermittent, and temporary, and were not expected to be cumulatively considerable in previous environmental documents for these projects. Construction of the Phase 1–4a Projects would temporarily increase traffic levels on some local and regional roadways, but the majority of truck trips would take place off of public roads. There are no other related projects in the vicinity that are likely to compound the significant temporary traffic impacts of the Phase 1–4a Projects. Construction of the Phase 3 and Phase 4a Projects, however, are much more likely now to overlap in terms of use of borrow areas during the same construction season. Although the two project phases are expected to use different haul routes and may not add to each other’s traffic loads on public roads, portions of these project phases could be constructed simultaneously, potentially compounding traffic levels and associated traffic hazards in some locations. Because of the increasing likelihood of compounding construction traffic levels, cumulatively significant traffic impacts could occur. Therefore, USACE and SAFCA have now determined that the Phase 1–4a Projects could result in a cumulatively considerable incremental contribution to a cumulatively significant impact on transportation and circulation from increased truck traffic from overlapping Phase 3 and 4a Project construction activities.

Phase 4b Project

Impacts of the Phase 4b Project’s construction activities on emergency access would be site-specific, intermittent, and temporary, and are not expected to be cumulatively considerable. Construction activities would temporarily increase traffic levels on some local and regional roadways, but the majority of haul truck trips would take place off of public roads. Temporary traffic increases associated with the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative—in addition a portion of the Phase 4a Project construction (Reach B:13–15) taking place in 2012—would be limited to the roadways shown on Plate 2-6. Some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other’s traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site. There are no other anticipated projects in the vicinity that are likely to compound the significant temporary traffic impacts of the project. Even though impacts would be temporary, short-term, and intermittent, cumulative traffic impacts could be significant if portions of the Phase 4a and 4b Projects are constructed in the same locations during the same time periods. Therefore, the Phase 4b Project would result in a cumulatively considerable incremental contribution to a cumulatively significant impact on transportation and circulation from increased truck traffic from overlapping Phase 4a and 4b Project construction activities.
5.1.5.12  **AIR QUALITY**

**Phase 1–4a Projects**

The Phase 1–4a Projects and related future projects would contribute to air pollutant emissions in Sutter and Sacramento Counties and to the nonattainment status of the Feather River Air Quality Management District (FRAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD) for ozone and respirable particulate matter 10 micrometers or less (PM$_{10}$), primarily through construction emissions. Other medium- and large-sized reasonably foreseeable projects, such as the anticipated developments in the Natomas Basin, would similarly contribute substantially to air quality impacts. Given the large scale of development that is expected in the Natomas Basin alone, as well as the nonattainment status of the Sacramento Valley Air Basin for ozone and PM$_{10}$, cumulative construction-related air quality impacts are expected to be significant and unavoidable. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects would result in a *cumulatively considerable incremental contribution* to a cumulatively significant impact on air quality during project construction activities.

**Phase 4b Project**

Because the materials quantities, truck trips required to deliver those materials, and other construction activities are similar, the emissions of criteria pollutants under the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative are also similar. With implementation of mitigation measures, construction of the Phase 4b Project would result in less-than-significant temporary and short-term construction-related air quality impacts associated with generation of oxides of nitrogen (NO$_X$), PM$_{10}$, and volatile organic compounds (VOC). However, other medium-sized and large reasonably foreseeable projects, such as the anticipated developments in the Natomas area, would contribute substantially to air quality impacts. Given the large scale of development that is expected in the Natomas Basin alone, as well as the nonattainment status of the Sacramento Valley Air Basin for ozone and PM$_{10}$, cumulative construction-related air quality impacts are expected to be significant and unavoidable. For these reasons, the Phase 4b Project would result in a *cumulatively considerable incremental contribution* to a cumulatively significant impact on air quality associated with generation of NO$_X$, PM$_{10}$ (including PM$_{2.5}$), and VOC during construction.

5.1.5.12  **CLIMATE CHANGE**

**Phase 1–4a Projects**

In comparison to criteria air pollutants, such as ozone and PM$_{10}$, carbon dioxide (CO$_2$) emissions persist in the atmosphere for a much longer period of time. Greenhouse gas (GHG) emissions generated by the Phase 1–4a Projects would predominantly be in the form of CO$_2$. Project construction would result in a net increase in emissions during the construction periods for the Phase 1–4a Projects, despite the implementation of mitigation measures. Because of the intensity and duration of construction activities, and the lack of available mitigation measures to abate GHG emissions from heavy-duty construction equipment exhaust and on-road hauling emissions, the project’s construction emissions would be significant and unavoidable with respect to climate change. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects would result in a *cumulatively considerable incremental contribution* to a cumulatively significant impact on GHG emissions and climate change from heavy-duty construction equipment exhaust and on-road hauling emissions.

**Phase 4b Project**

Project construction would result in a net increase in GHG emissions over a period of 5 years (2012–2016). These emissions would predominantly be in the form of CO$_2$ generated by internal combustion engines in construction equipment, and would occur despite the implementation of mitigation measures designed to reduce emissions. As
discussed below, the Phase 4b Project consists of levee improvements, canal relocations, habitat creation, and channel erosion site remediation, and would not produce a net increase in operational GHG emissions. An additional project contribution would be a short-term increase in the accumulation of CO₂ in the atmosphere caused by the short-term reduction in carbon stock contained in woodlands that would be removed as part of project construction. Because impacts to woodlands would differ between the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative, changes in carbon sequestration are modeled and reported for both alternatives. The emissions for both alternatives are summarized at the end of this section in.

**Combustion Sources from Project Construction**

Currently, the California Air Resources Board (ARB), FRAQMD, or SMAQMD have not identified a significance threshold for analyzing GHG emissions generated by a proposed project or developed a methodology for analyzing cumulative impacts related to global warming. Although the state of California has identified GHG reduction goals through adoption of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, the effect of GHG emissions as they relate to global climate change is inherently a cumulative impact issue. Although the emissions of one single project would not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulatively considerable contribution to a significant cumulative impact with respect to global climate change. To meet AB 32 goals, California would need to generate less GHG emissions than current levels.

The primary objective of AB 32 is to reduce California’s contribution to global warming by reducing California’s total annual production of GHG emissions. The impact that GHG emissions have on global climate change does not depend on whether they were generated by stationary, mobile, or area sources or whether they were generated in one region or another. Thus, the net change in total GHG levels generated by a project or activity is the best metric for determining whether a project would contribute to global warming. In the case of the action alternatives, if the size of the increase in emissions from the project is considered to be substantial, then the impact of the project would be cumulatively considerable.

In comparison to criteria air pollutants, such as ozone and PM₁₀, CO₂ emissions persist in the atmosphere for a much longer period of time. GHG emissions generated by the Adjacent Levee Alternative (Proposed Action) and Fix-In-Place Alternative would predominantly be in the form of CO₂. Project construction would result in a net increase in emissions to occur over a period of 5 years (2012–2016), despite the implementation of Mitigation Measure 4.11-a. Although any increase in GHG emissions would add to the quantity of emissions that would contribute to global climate change, it is noteworthy that emissions associated with the Adjacent Levee Alternative (Proposed Action) occur over a finite period of time (5 years), as opposed to operational emissions, which would occur over the lifetime of a project. The project would have no net increase in operational GHG emissions. Nonetheless, because of the intensity and duration of construction activities, and the lack of available mitigation measures to abate GHG emissions from heavy-duty construction equipment exhaust and on-road hauling emissions, the project’s construction emissions would make an incremental contribution to climate change.

Previous GHG analyses conducted for the Phase 2 EIR, Phase 2 EIS, and Phase 3 EIS and EIR, concluded that the project’s contribution to cumulative GHG impacts would be considerable and would be a significant and unavoidable cumulative impact (see Sections 5.1.3.2 and 5.1.3.3, above). The quantification methodologies and threshold concepts from the California Air Pollution Control Officers Association (CAPCOA) in the CEQA & Climate Change document (CAPCOA 2008), from the California Office of Planning and Research (OPR) in the CEQA Guideline Amendments for Greenhouse Gas Emissions (OPR 2009), and from ARB in the recently adopted AB 32 Scoping Plan (ARB 2008a) and the Preliminary Draft Staff Proposal Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act (ARB 2008b), have allowed further refinement of the GHG analysis, which was implemented in the Phase 3
FEIS and Phase 4a EIS and EIR, as well as in this EIS/EIR. Using this guidance, it is possible to discuss the project’s emissions of GHG in a larger context.

As calculated in Appendix F and shown in Table 5-4, cumulative mobile source emissions generated during construction of the Phase 4a and 4b Projects would generate approximately 25,000 metric tons of CO₂, with the highest annual emissions of approximately 13,700 metric tons occurring in 2012. It should be noted that GHG emissions reported for the 4a Project did not factor in the net gain in carbon sequestration that would occur from replacement of woodland lost to construction. Because woodland impacts would be mitigated under those project phases at a 2:1 to 3:1 ratio, these emissions estimates would likely be substantially lower than previously reported.

For most projects, no simple metric is available to determine if a single project would substantially increase or decrease overall GHG emission levels. To establish additional context in which to consider the order of magnitude of project-generated GHG emissions, it may be noted that facilities (i.e., stationary, continuous sources of GHG emissions) that generate greater than 25,000 metric tons CO₂/year are mandated to report GHG emissions to CARB pursuant to AB 32. In addition, a threshold of 10,000 metric tonnes CO₂/year was recommended by the Market Advisory Committee for inclusion in a GHG cap and trade system, a threshold of 10,000 metric tonnes CO₂/year adopted by the South Coast Air Quality Management District for stationary/industrial projects, and a draft preliminary threshold of 7,000 metric tons of CO₂e/year for industrial projects by ARB.

For the purpose of evaluating impacts on climate change from the Phase 4b Project’s construction activities, absent any agency-adopted threshold for GHG emissions, it is notable that, even in the peak year of construction (2012), the 13,700 metric tons that would be generated by the Adjacent Levee Alternative (Proposed Action) would be substantially less than the 25,000 metric tons of CO₂/year AB 32 reporting targets. This information is presented for informational purposes, and it is not the intention of the project proponent(s) to adopt 25,000 metric tons CO₂/year as a numeric threshold. Rather, the intention is to put project-generated GHG emissions in the appropriate statewide context in order to evaluate the contribution to the global impact of climate change. SMAQMD has also recently released draft BMPs for consideration as practical alternatives to reduce construction-generated GHG emissions. As part of Mitigation Measure 4.11-a, “Implement Applicable District-Recommended Control Measures to Minimize Temporary Emissions of ROG, NOₓ, and PM₁₀ during Construction,” the project proponent(s) would implement a range of measures to reduce GHG emissions, which may include the following:

- improve fuel efficiency from construction equipment by reducing unnecessary idling (modify work practices, install auxiliary power for driver comfort); performing equipment maintenance (inspections, detect failures early, corrections); training equipment operators in proper use of equipment; use the proper size of equipment for the job; and using equipment with new technologies (re-powered engines, electric drive trains);
- use alternative fuels for generators at construction sites such as propane or solar, or use electrical power;
- encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes;
- reduce electricity use in the construction office by using compact fluorescent bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones;
- recycle or salvage non-hazardous construction and demolition debris (goal of at least 75% by weight);
- use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, and sidewalk and curb materials); and
- develop and implement a plan to efficiently use water for adequate dust control.
Table 5-4 provides total GHG emissions for each of the 5 years of construction activities, the total finite mass of GHG emissions for the entire Adjacent Levee Alternative (Proposed Action) by county, and compares the GHG emissions to the AB32 Minimum Standard for Reporting threshold.

<table>
<thead>
<tr>
<th>Phase 4b Project Construction Season</th>
<th>Sutter County (tons)</th>
<th>Sacramento County (tons)</th>
<th>Total (tons)</th>
<th>Total (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20123</td>
<td>279.4</td>
<td>14,779.8</td>
<td>15,058.8</td>
<td>13,661.1</td>
</tr>
<tr>
<td>2013</td>
<td>-</td>
<td>3,671.2</td>
<td>3,671.2</td>
<td>3,330.5</td>
</tr>
<tr>
<td>2014</td>
<td>585.0</td>
<td>2,685.9</td>
<td>3,270.9</td>
<td>2,967.3</td>
</tr>
<tr>
<td>2015</td>
<td>167.5</td>
<td>2,879.4</td>
<td>3,046.9</td>
<td>2,764.1</td>
</tr>
<tr>
<td>2016</td>
<td>1,223.5</td>
<td>1,293.8</td>
<td>2,517.3</td>
<td>2,283.7</td>
</tr>
<tr>
<td>Total (tons)</td>
<td>2,255.4</td>
<td>25,310.1</td>
<td>27,565.1</td>
<td>-</td>
</tr>
<tr>
<td>Total (metric tons)</td>
<td>2,046</td>
<td>22,960.9</td>
<td>25,006.7</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: Construction emissions of CO₂ for the Fix-in-Place Alternative result in approximately 26,089 metric tons; components of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative are identical except for proposed work at the Sacramento River east levee.

1 GHG emissions are modeled as carbon dioxide emissions resulting from combustion from operation of diesel-fueled construction emissions.
2 See Table 4.11-1 in Section 4.11, “Air Quality,” for schedule and activity detail. Additional assumptions and detailed modeling results are presented in Appendix F.
3 Includes Phase 4a Project components to occur within Sacramento County, including Sacramento River east levee Reaches B:13–15 and Riverside Canal.
Source: Data compiled by AECOM in 2010

Not included in the calculation of greenhouse gas emissions, but relevant to the adaption responses to climate change impacts, is that the Phase 4b Project is designed to accommodate changes in the amount, timing, and intensity of rain and storm events that would result from greenhouse warming.

**Reduction in Sequestration of Atmospheric CO₂**

**Carbon Stock**

Construction of the Phase 4b Project would involve removal of vegetation from the footprint of the proposed levee improvements. Tree brush removal, as well as mulching associated with disposal of this material, would cause some of the accumulated carbon in the woodland biomass (“carbon stock”) to be released into the atmosphere. An estimate of the total biomass accumulation in trees and other vegetation within the project area has been performed to evaluate how much sequestered CO₂ and other GHG emissions would be released if the live trees, standing dead trees, or downed-woody debris are disposed.

Empirical data to support this analysis are limited because of the challenge of quantifying the wide variety of carbon cycling regimes present in forested landscape. Oak woodlands, for example, exhibit a wide variation in sequestration both spatially and temporally due to the regular occurrence of fire and re-growth, physiographic variety across the oak woodland biome, pests, grazing, or the potential changes to ecosystem structure associated with climate change. To identify sequestration rates for a particular site, measurements would need to be taken over a long time period (likely several years or more) and must consider infrequent events such as fire or pest
outbreaks, which occasionally release carbon.

The best available empirical data was used to estimate the potential range of sequestered carbon loss due to the removal of native woodlands from the project area. The Carbon On-line Estimator (COLE), developed by the United States Department of Agriculture (USDA), Forest Service, and the National Council for Air and Stream Improvements, Inc. (NCASI), uses the approved methodologies presented in the California Climate Action Registry’s (CCAR) Forest Project Protocol (CCAR 2009). COLE was used to estimate the biological carbon stocks by vegetation type based on forest sample plots. For this analysis, COLE produced a carbon report with average forest carbon stocks by hectare for Sacramento, Sutter, Yuma, and Placer Counties based on the mean volume of carbon by forest type (species) (NCASI, Inc. 2007). These counties represent the region in which the Phase 4b Project is located, and provide an estimate for applicable forest carbon stocks. The results of the COLE carbon report are presented in Table 5-5.

<table>
<thead>
<tr>
<th>Species</th>
<th>Mean Volume (m^3/hectare)</th>
<th>Live Tree</th>
<th>Dead Tree</th>
<th>Under-Story</th>
<th>Down Dead Wood</th>
<th>Forest Floor</th>
<th>Total Non-soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woodlands (Blue Oak)</td>
<td>74.9</td>
<td>43.4</td>
<td>0.4</td>
<td>6.6</td>
<td>3</td>
<td>31.4</td>
<td>84.8</td>
</tr>
<tr>
<td>California White Oak (Valley Oak)</td>
<td>49.5</td>
<td>25.3</td>
<td>0.9</td>
<td>4.5</td>
<td>1.3</td>
<td>25.5</td>
<td>57.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>124.4</strong></td>
<td><strong>68.7</strong></td>
<td><strong>1.3</strong></td>
<td><strong>11.1</strong></td>
<td><strong>4.3</strong></td>
<td><strong>56.9</strong></td>
<td><strong>142.3</strong></td>
</tr>
</tbody>
</table>

Notes: 1 Hectare = 2.47 acres
1 Represents average carbon stocks for Sacramento, Sutter, Yuma, and Placer Counties.
2 The total non-soil carbon (in tons per hectare) in Table 5-5 is used to quantify the potential increase in atmospheric CO2, as shown in Table 5-7. COLE guidelines identify carbon stock in soil as insignificant compared to non-soil, and therefore is not included in estimating the loss of carbon stock due to the proposed project.


As shown in Table 5-5, the quantity of carbon contained in a given hectare of forested area around the project area is estimated to be 142.3 tons. The Natomas Basin perimeter levee system encompasses approximately 21,448 hectares (or 53,000 acres). The Adjacent Levee Alternative (Proposed Action) would remove approximately 19.5 hectares (48 acres) of woodlands; the Fix-in-Place Alternative would remove approximately 26.7 hectares (66 acres) of woodlands. The proposed woodland removal and replacement for the Phase 4b Project are presented in Table 5-6.

Adjacent Levee Alternative's (Proposed Action's) Carbon Stock Impacts

Under the Adjacent Levee Alternative (Proposed Action), approximately 19.5 hectares (see Table 4.7-2) would be affected, resulting in a release of total potential carbon stock—through disposal of live trees, standing dead trees, or downed-woody debris—of approximately 2,775 tons or 2,517 metric tons. Smaller trees and vegetation, however, would be transplanted, preserving some of the carbon stock.
### Table 5-6
**Phase 4b Project Woodland Removal and Replacement**

<table>
<thead>
<tr>
<th></th>
<th>Landside (hectares)</th>
<th>Waterside (hectares)</th>
<th>Total (hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjacent Levee Alternative (Proposed Action)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal</td>
<td>14.6</td>
<td>4.9</td>
<td>19.5</td>
</tr>
<tr>
<td>Replacement</td>
<td>29.1</td>
<td>14.6</td>
<td>43.7</td>
</tr>
<tr>
<td><strong>Fix-in-Place Alternative</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal</td>
<td>14.2</td>
<td>12.5</td>
<td>26.7</td>
</tr>
<tr>
<td>Replacement</td>
<td>28.3</td>
<td>37.6</td>
<td>65.9</td>
</tr>
</tbody>
</table>

Source: Data compiled by AECOM in 2010

The Adjacent Levee Alternative (Proposed Action) would replace an estimated 43.7 hectares, or over two times the woodland area lost, through project design features and mitigation. Under Mitigation Measure 4.7-a, affected waterside woodlands would be replaced at a 1:1 ratio where vegetation is removed below the ordinary high water mark, and replaced at a 3:1 ratio where vegetation is removed above the ordinary high water mark.

As shown in **Table 5-7**, the total impact to carbon stock may result in a 3,124 metric tons carbon/year net benefit in the Phase 4b Project area under the Adjacent Levee Alternative (Proposed Action).

### Table 5-7
**Adjacent Levee Alternative’s (Proposed Action’s) Total Impact to Carbon Stock in the Project Area**

<table>
<thead>
<tr>
<th>Phase 4b Project Area (hectares)</th>
<th>Carbon Stock in the Project Area (metric tons carbon/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon stock removal</td>
<td>19.5 (2,517)</td>
</tr>
<tr>
<td>Carbon stock replaced</td>
<td>43.7 5,641</td>
</tr>
<tr>
<td><strong>Net impact</strong></td>
<td>24.2 3,124</td>
</tr>
</tbody>
</table>

Note: Negative numbers shown in parenthesis.
Source: Data compiled by AECOM in 2010

**Fix-In-Place Alternative’s Carbon Stock Impacts**

Under the Fix-in-Place Alternative, approximately 26.7 hectares of woodland would be removed (see **Table 4.7-2**), resulting in release of carbon stock—through disposal of live trees, standing dead trees, and downed-woody debris—of 3,799 tons or 3,447 metric tons. Many of the smaller trees and vegetation that would be lost from implementation of the Fix-in-Place Alternative, however, would be transplanted so that some of the carbon stock would be preserved.

The Fix-in-Place Alternative would replace an estimated 65.9 hectares, or over two times the woodland area lost, through project design features and mitigation. Landside woodlands that would be lost to project construction would be replaced at a 2:1 ratio on a per-acre basis, as part of the habitat creation component of the Phase 4b Project. Under Mitigation Measure 4.7-a, affected waterside woodlands would be replaced at a 1:1 ratio where vegetation is removed below the ordinary high water mark, and replaced at a 3:1 ratio where vegetation is removed above the ordinary high water mark.
As shown in Table 5-8, the total impact to carbon stock may result in a 5,060 metric tons carbon/year net benefit in the project area under the Fix-in-Place Alternative.

<table>
<thead>
<tr>
<th>Table 5-8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fix-in-Place alternative’s Total Impact to Carbon Stock in the Project Area</strong></td>
</tr>
<tr>
<td>Phase 4b Project Area (hectares)</td>
</tr>
<tr>
<td>Carbon stock removal 26.7</td>
</tr>
<tr>
<td>Carbon stock replaced 65.9</td>
</tr>
<tr>
<td><strong>Net impact</strong> 39.2</td>
</tr>
</tbody>
</table>

Note: Negative numbers shown in parenthesis.
Source: Data compiled by AECOM in 2010

Carbon Sequestration

The process of carbon sequestration would decrease, and in some cases be eliminated, through the removal of trees and other vegetation as a result of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative. Many of the trees and vegetation that would be lost as a result of implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would be transplanted so as to continue the sequestration process as well as releasing minimal amounts of CO₂. Those that are not transplanted would be removed from the site and processed for mulching and groundcover. Burning of the biomass would not occur. An estimate of the potential carbon sequestration loss has been performed to evaluate the CEQA question of how much potential CO₂ sequestration would be lost as a result of project impacts to live native trees (including roots) 3 inches or greater in diameter at breast height (dbh).

The USDA Forest Service defines carbon sequestration as “the process by which atmospheric carbon dioxide is absorbed by trees [plants] through photosynthesis and stored as carbon in biomass and soils (NCASI, Inc., 2007).” Sequestration rates for the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative (oak woodlands) were drawn from Baldacci et al. in units of metric tons per hectare per year (i.e., a continuous process).

Adjacent Levee Alternative’s (Proposed Action’s) Carbon Sequestration Impacts

The total hectares for the Adjacent Levee Alternative (Proposed Action) are based on information collected for the evaluation of biological resources (see Table 4.7-1). Table 5-9 lists the sequestration rate assumptions and total annual sequestration calculations for the Adjacent Levee Alternative (Proposed Action).

<table>
<thead>
<tr>
<th>Table 5-9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Carbon Sequestration Calculations for the Adjacent Levee Alternative (Proposed Action)</strong></td>
</tr>
<tr>
<td>Phase 4b Project (hectares)</td>
</tr>
<tr>
<td>Landside woodland 14.6</td>
</tr>
<tr>
<td>Waterside riparian woodland 4.9</td>
</tr>
<tr>
<td><strong>Total</strong> 19.5</td>
</tr>
</tbody>
</table>

¹ From Baldacci et al.
Source: Data compiled by AECOM in 2010
Quantification of the long-term annual impact of the Adjacent Levee Alternative (Proposed Action) on carbon sequestration is based on the removal of existing biomass (sequestration loss) and any planned replacement through created land cover (sequestration gain), as discussed above. Table 5-10 quantifies the annual carbon sequestration (loss versus gain) from changes in woodland cover under the Adjacent Levee Alternative (Proposed Action).

### Table 5-10
Adjacent Levee Alternative's (Proposed Action's) Total Annual Sequestration for the Project Area – Existing Land Cover versus Created/Re-established Land Cover

<table>
<thead>
<tr>
<th>Phase 4b Project (hectares)</th>
<th>Annual Sequestration in the Project Area (metric tons carbon/year)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree removal (sequestration loss)</td>
<td>19.5</td>
</tr>
<tr>
<td>Created land cover (sequestration gain)</td>
<td>43.7</td>
</tr>
<tr>
<td><strong>Net impact</strong></td>
<td><strong>24.2</strong></td>
</tr>
</tbody>
</table>

¹ Sequestration calculated as the sequestration rate of 1.5 metric tons carbon/ha/year multiplied by the number of hectares.
Source: Data compiled by AECOM in 2010

As shown in Table 5-10, the net change in annual carbon sequestration in the project area is an estimated benefit of 35.5 metric tons of carbon per year for the Adjacent Levee Alternative (Proposed Action).

**Fix-in-Place Alternative’s Carbon Sequestration Impacts**

The total hectares for the Fix-in-Place Alternative are based on information collected for the evaluation of biological resources (see Table 4.7-1). Table 5-11 lists the sequestration rate assumptions and total annual sequestration calculations for the Fix-in-Place Alternative.

### Table 5-11
Annual Carbon Sequestration Calculations for the Fix-in-Place Alternative

<table>
<thead>
<tr>
<th>Phase 4b Project (hectares)</th>
<th>Sequestration Rate¹ (metric tons carbon/ha/year)</th>
<th>Total Annual Sequestration (metric tons carbon/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landside woodland</td>
<td>14.2</td>
<td>1.50</td>
</tr>
<tr>
<td>Waterside riparian woodland</td>
<td>12.5</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26.7</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

¹ From Baldacci et al.
Source: Data compiled by AECOM in 2010

Quantification of the long-term annual impact of the Fix-in-Place Alternative on carbon sequestration is based on the removal of existing biomass (sequestration loss) and any planned replacement through created land cover (sequestration gain), as discussed above. Table 5-12 quantifies the annual carbon sequestration (loss versus gain) from changes in woodland cover under the Fix-in-Place Alternative.

As shown in Table 5-12, the net change in annual carbon sequestration in the project area is an estimated benefit of 59 metric tons of carbon per year for the Fix-in-Place Alternative.
Table 5-12
Fix-In-Place alternative’s Total Annual Sequestration for the Project Area – Existing Land Cover versus Created/Re-established Land Cover

<table>
<thead>
<tr>
<th>Description</th>
<th>Phase 4b Project (hectares)</th>
<th>Annual Sequestration at the Project Site (metric tons carbon/year) (^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree removal (sequestration loss)</td>
<td>26.7</td>
<td>40.0</td>
</tr>
<tr>
<td>Created land cover (sequestration gain)</td>
<td>66.0</td>
<td>99.0</td>
</tr>
<tr>
<td>Net impact</td>
<td>39.3</td>
<td>59.0</td>
</tr>
</tbody>
</table>

\(^1\) Sequestration calculated as the sequestration rate of 1.5 metric tons carbon/ha/year multiplied by the number of hectares.
Source: Data compiled by AECOM in 2010

Adjacent Levee Alternative’s (Proposed Action’s) Total Carbon Impact

As a result of woodland replacement, the Adjacent Levee Alternative (Proposed Action) would provide a net benefit in carbon stock and sequestration of 3,159 metric tons of carbon or 11,595 metric tons of CO\(_2\), as shown in Table 5-13. The majority of the carbon would come from carbon stock replacement provided through woodland creation as part of the Phase 4b Project and through implementation of mitigation measures. This is a conservative estimate because some portions of removed wood would be sequestered in the soil in the project area through mulching or could remain sequestered in wood products.

Table 5-13
Potential Biological Carbon Change Summary for the Adjacent Levee Alternative (Proposed Action)

<table>
<thead>
<tr>
<th>Description</th>
<th>Sequestration Gain (metric tons carbon)</th>
<th>Sequestration Gain (metric tons CO(_2)) (^1)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential gain of carbon stocks</td>
<td>3,124</td>
<td>11,465(^2)</td>
<td>Gains in carbon stock could be greater than estimated due to sequestration in soils through burial or mulching, converted in wood products, or possibly used in biomass energy generation.</td>
</tr>
<tr>
<td>Potential gain of carbon sequestration</td>
<td>35.5</td>
<td>130</td>
<td>Sequestration gain may be lower than estimated depending on forest fire regime, climate change impacts to forest ecology, or decreases in sequestration with forest age.</td>
</tr>
<tr>
<td><strong>Total potential decrease in atmospheric CO(_2)</strong></td>
<td><strong>3,159</strong></td>
<td><strong>11,595</strong></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Based on a conversion of 3.67 tons of CO\(_2\) per ton of carbon.
\(^2\) Assumes the entire carbon stock is converted to CO\(_2\) in a single year.
Source: Data compiled by AECOM in 2010

Although the Adjacent Levee Alternative (Proposed Action) would result in a net benefit of carbon stocks and sequestration capacity, the Adjacent Levee Alternative (Proposed Action) would result in short-term impacts to woodland because of the decades of time required for forest restoration/re-growth to achieve the current woodland carbon stock and sequestration capacity. Based on reforestation assumptions, the estimated age class of the carbon stock (estimated at 142.3 tons of carbon per hectare) within the affected area is 60 years (NCASI 2010). Therefore, although the Adjacent Levee Alternative (Proposed Action) would result in long-term carbon stock and sequestration gain, the rate of return would take up to 60 years and would result in a short-term impact to existing carbon stock capacity and sequestration rates.
Fix-in-Place Alternative’s Total Carbon Impact

As a result of woodland replacement, the Fix-in-Place Alternative would provide a net benefit in carbon stock and sequestration of 5,114 metric tons of carbon or 18,768 metric tons of CO₂, as presented in Table 5-14. The majority of the carbon would come from carbon stock replacement provided through project design features and mitigation measures. This is a conservative estimate because some portions of removed wood would be sequestered in the soil in the Fix-in-Place Alternative project area through mulching or could remain sequestered in wood products.

<table>
<thead>
<tr>
<th>Description</th>
<th>Sequestration Gain</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(metric tons carbon)</td>
<td>(metric tons CO₂)¹</td>
</tr>
<tr>
<td>Potential gain of carbon stocks</td>
<td>5,060</td>
<td>18,570²</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gains in carbon stock could be greater than estimated due to sequestration in soils through burial or mulching, converted in wood products, or possibly used in biomass energy generation.</td>
</tr>
<tr>
<td>Potential gain of carbon sequestration</td>
<td>54</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sequestration gain may be lower than estimated depending on forest fire regime, climate change impacts to forest ecology, or decreases in sequestration with forest age.</td>
</tr>
<tr>
<td>Total potential decrease in atmospheric</td>
<td>5,114</td>
<td>18,768</td>
</tr>
<tr>
<td>CO₂</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Based on a conversion of 3.67 tons of CO₂ per ton of carbon.
² Assumes the entire carbon stock is converted to CO₂ in a single year.
Source: Data compiled by AECOM in 2010

Although the Fix-in-Place Alternative would result in a net benefit of carbon stocks and sequestration capacity, the Fix-in-Place Alternative would result in short-term impacts to woodland because of the decades of time required for forest restoration/re-growth to achieve the current woodland carbon stock and sequestration capacity. Based on reforestation assumptions, the estimated age class of the carbon stock (estimated at 142.3 tons of carbon per hectare) within the affected area is 60 years (NCASI 2010). Therefore, although the Fix-in-Place Alternative would result in long-term carbon stock and sequestration gain, the rate of return would take up to 60 years and would result in a short-term impact to existing carbon stock capacity and sequestration rates.

**Climate Change Impact Summary**

The net GHG emissions for both the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative are shown in Table 5-15.

<table>
<thead>
<tr>
<th>Source</th>
<th>Adjacent Levee Alternative (Proposed Action) (metric tons)</th>
<th>Fix-in-Place Alternative (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CO₂ construction emissions (2012–2016)</td>
<td>25,007</td>
<td>26,089</td>
</tr>
<tr>
<td>Decrease in atmospheric CO₂ from gain in sequestration</td>
<td>11,595</td>
<td>18,768</td>
</tr>
<tr>
<td>Net GHG emissions</td>
<td>13,412</td>
<td>7,329</td>
</tr>
</tbody>
</table>

Source: Data compiled by AECOM in 2010
The estimated GHG emissions of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would be temporary and short-term in nature and would be substantially reduced through a long-term gain in carbon sequestration. Because the net GHG emissions would be below the minimum standard for reporting requirements under AB 32 (25,000 metric tons CO2/year), and because the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would implement a range of measures to reduce GHG emissions, the Phase 4b Project’s GHG emissions would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact on GHG emissions and global climate change.

5.1.5.13 Noise

Ambient noise levels in the Natomas Basin are generated by sources that include aircraft operations, truck traffic on area roadways, and agricultural activity.

Phase 1–4a Projects

Impacts of the Phase 1–4a Projects’ construction activities on noise would be site-specific, intermittent, and temporary, and were not expected to be cumulatively considerable in previous environmental documents for these projects. Construction of the Phase 1–4a Projects would temporarily increase traffic levels on some local and regional roadways, but the majority of truck trips would take place off of public roads. There are no other related projects in the vicinity that are likely to compound the significant temporary traffic impacts of the Phase 1–4a Projects. Construction of the Phase 3 and Phase 4a Projects, however, are much more likely now to overlap in terms of use of borrow areas during the same construction season. Although the two project phases are expected to use different haul routes and may not add to each other’s traffic loads on public roads, portions of these project phases could be constructed simultaneously, potentially compounding traffic levels, which in turn would increase noise levels in some locations.

Given the increasing likelihood of the scenario summarized above, the Phase 1–4a Projects would have a significant and unavoidable project-level impact on noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic. A substantial number of residences are located adjacent to the portions of the NEMDC (Phase 3 Project) and the Sacramento River east levee (Phase 4a Project), where cutoff walls would be installed 24 hours per day, 7 days per week at times. In some locations along the NCC and Sacramento River east levee, construction work could take place simultaneously as part of the Phase 1–4a Projects. If constructed in the same locations during the same time periods, the Phase 1–4a Projects have the potential to cumulatively affect noise levels at residences in these areas, including during noise-sensitive hours. No feasible mitigation measures are available. For these reasons, USACE and SAFCA determined that the Phase 1–4a Projects would result in a cumulatively considerable incremental contribution to a cumulatively significant impact from increased construction-related noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction-related traffic.

Phase 4b Project

The Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would both have a significant and unavoidable project-level impact on noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic. A substantial number of residences are located adjacent to the Sacramento east levee where cutoff walls would be installed. Some overlap of haul trips between the Phase 4a and 4b Projects could occur if the West Lakeside School Site is used as a borrow site for the Phase 4b Project, which could potentially add to each other’s traffic loads on short sections of Del Paso and Powerline Roads in the vicinity of the Novak borrow site, increasing noise levels in the vicinity of residents along these haul routes. In addition, construction in Sacramento River east levee Reach B:15 as part of the Phase 4a Project could occur simultaneously with construction in Reach A:16, further increasing noise levels from haul trucks and levee construction equipment for residents in the vicinity of this area of potentially overlapping construction. No
feasible mitigation measures are available. Under the Fix-in-Place Alternative, construction of levee improvements would also occur directly along the Sacramento River east levee at many locations adjacent to residences on the waterside of Garden Highway, and to a lesser extent, the landside of the levee. The combined effect of noise from simultaneous construction of erosion control improvements on the waterside and levee improvements on the landside would be amplified and would affect a small number of residences on Garden Highway in the vicinity of the erosion control site, causing a project-level significant impact. This specific impact, however, could be decreased by scheduling construction of the erosion control improvements to occur before or after the nearby levee improvement work. For these reasons, the Phase 4b Project would result in a cumulatively considerable incremental contribution to a cumulatively significant impact from increased construction-related noise levels experienced by the occupants of residences that are near sites of construction activity or haul routes for construction traffic.

5.1.5.14 RECREATION

Phase 1–4a Projects

There are no public or private recreational facilities located within the Phase 4a Project area, and the project would not introduce new housing into the area that would create additional demand for recreational facilities. The Phase 1–3 Projects, however, would potentially disturb access to recreational facilities in the Natomas Basin during construction, temporarily degrade the quality of recreational experiences as a result of construction activity and noise, and potentially damage recreational facilities on and adjacent to the NEMDC (Ueda Parkway bicycle trail and Gardenland Park). Reconstruction and restoration of any damaged park facilities would be required, and coordination with the public and recreation agencies would ensure that any residual effects would be minimized. Because of the temporary nature of the construction impacts and the likelihood that any access restrictions or degradation of the quality of recreational experiences would last for less than one construction season in any location, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

Impacts of the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative on recreational uses would be limited to potential temporary disturbance of access to facilities on the western, eastern, and southern perimeter of the Natomas Basin during construction; potential temporary degradation in the quality of recreational experiences as a result of construction activity and noise; and damage to recreational facilities on and adjacent to the Sacramento River east levee (Reach A:19A–20) and the NEMDC, including the Ueda Parkway Bike Trail, Shorebird Park, Costa Park Site, Natomas Oaks Preserve, Bannon Creek Preserve, and Niños Parkway. Because of the temporary nature of the construction impacts and the likelihood that any access restrictions or degradation of the quality of recreational experiences would last for less than one construction season in any location, these impacts are not considered substantial enough to make a cumulatively considerable incremental contribution to a significant cumulative impact. Reconstruction and restoration of damaged park facilities would be required (Mitigation Measure 4.15-a). Recreation impacts would occur on a temporary project-specific basis rather than a cumulative basis, and any such incidents would be isolated. Therefore, the Phase 4b Project and related projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.15 VISUAL RESOURCES

Phase 1–4a Projects

The Phase 1–4a Projects would include the removal of trees, other vegetation, and structures from the landside and/or waterside of the Sacramento River east levee within the footprint of the adjacent setback levee and berms.
These projects also include the removal of some vegetation and structural encroachments from the waterside of the Sacramento River east levee as part of encroachment removal actions, and would include the removal of trees from areas along the waterside of the NCC south levee. SAFCA’s proposed levee integrity program would also require the removal of vegetation and other features that currently add to the rural and riverine character of views in the area. These changes would contribute to the substantial degradation of scenic resources in the Natomas Basin that are expected to result from various development projects and expansion of Airport facilities, as the area’s visual character changes from rural agricultural landscape to urban/suburban setting. The Phase 1–4a Projects include the establishment of a substantial acreage of woodland plantings around the Basin to offset the projects’ significant effects on scenic resources (oak and other native trees). The plantings, however, would require several years to become well established and several decades to achieve the same size and aesthetic value as the existing mature vegetation that would be removed, which in some cases such as Heritage oaks is likely 100 years old or older. Additionally, the Levee Raise-in-Place (Phase 3 Project) and RSLIP (Phase 4a Project) Alternatives would result in the loss of high-aesthetic-value woodlands along the waterside of the levee.

Furthermore, the construction of an adjacent setback levee along the Sacramento River east levee in Reaches C:1 to B:13 would reduce views for motorists and other viewers along Garden Highway of the Natomas Basin and Central Valley. Generally, the height of the new adjacent setback levee would be 1–3 feet higher in elevation than the waterside hinge point of the existing Garden Highway, with the greatest elevations starting in the north and declining toward the south. However, the levee would be an additional 2–4 feet higher in up to 15 locations to accommodate other project features, such as pipeline crossings and roadway intersections. For example, where Sankey Road intersects Garden Highway in Reach C:1, the adjacent levee, which was constructed in 2009 as part of the Phase 2 Project, is an additional 3–4 feet higher for a length of approximately 40 feet, with 100–150-foot-long transitions on both sides back to the typical adjacent levee profile. These raised levee sections would further decrease views of the Basin from the Garden Highway, although their relatively short length and the fact that they would be widely spaced over 12 miles of highway would tend to minimize the effect somewhat. For these reasons, USACE determined that the Phase 1–4a Projects would result in a cumulatively considerable incremental contribution to a cumulatively significant impact on visual resources, primarily from removal of vegetation (mature oak and other native trees) and the long time period for replanted vegetation to reach similar sizes.

**Phase 4b Project**

The Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) would involve nighttime construction lighting that would be clearly visible from nearby residences. Nighttime lighting related to 24/7 construction of cutoff walls along the PGCC and NEMDC and potentially in Sacramento River east levee Reach A:16–19A (west of the I-80 overcrossing) in particular could create a new source of substantial light or glare that would adversely affect nighttime views in the area. In addition, nighttime lighting would also be used for drilling and testing of groundwater replacements wells. Construction-related nighttime lighting, however, would be localized and temporary and there are no other projects in the area that would contribute to a cumulative increase in light and glare. Therefore, the Phase 4b Project would not result in a cumulatively considerable incremental contribution to a significant cumulative impact.

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

The Fix-in-Place Alternative would result in similar impacts to visual resources as the Adjacent Levee Alternative (Proposed Action) except that the Sacramento River east levee would be widened in place, requiring greater removal of riparian woodlands on the waterside of these levee reaches to conform with USACE guidance regarding levee encroachments. Therefore, the Fix-in-Place Alternative would result in the loss of high-aesthetic-value woodlands along the waterside of the levee. Widening of the existing levee would add an additional obstruction of views toward the east, although less than under the Adjacent Levee Alternative (Proposed Action).

Because the replacement plantings that are part of the Phase 4b Project would be planted along the landside of the levee, and mitigation is not available to fully compensate for the loss of waterside vegetation (including SRA habitat), the Adjacent Levee Alternative (Proposed Action) and Fix-in-Place Alternative would result in a cumulatively considerable incremental contribution to a cumulatively significant impact on visual resources, primarily from removal of vegetation (mature oak and other native trees) and the long time period for replanted vegetation to reach similar sizes.

5.1.5.16 UTILITIES AND SERVICE SYSTEMS

Phase 1–4a Projects

Construction of the Phase 1–4a Projects may damage irrigation systems and public utility infrastructure, resulting in temporary disruptions to service. Coordination with irrigation system users, consultation with service providers, and implementation of appropriate protection measures would minimize the possibility of any significant effects. Because utility and service system impacts would be isolated, temporary, and fully mitigated on a project-by-project basis, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

Construction of the Phase 4b Project (Adjacent Levee Alternative [Proposed Action] and Fix-in-Place Alternative) may damage irrigation systems and public utility infrastructure, resulting in temporary disruptions to service. Coordination with irrigation system users, consultation with service providers, and implementation of Mitigation Measures 4.14-a and 4.14-b would minimize the possibility that any significant effect would occur. Because utility and service system impacts would be isolated, temporary, and fully mitigated on a project-by-project basis, the Phase 4b Project would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.17 HAZARDS AND HAZARDOUS MATERIALS

Phase 1–4a Projects

For the Phase 1–4a Projects, mitigation would be implemented to minimize the potential for exposure of people or the environment to hazardous materials encountered during construction activity. If hazardous materials are encountered, the impacts would be localized and would not be expected to combine with the impacts of related projects. Because hazards and hazardous materials impacts would occur on a project-specific basis rather than a cumulative basis, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.
Phase 4b Project

Mitigation would be implemented to minimize the Phase 4b Project’s potential for exposure of people or the environment to hazardous materials encountered during construction activity (Mitigation Measure 4.15-b). If hazardous materials are encountered, impacts would be localized and would not be expected to combine with the impacts of other projects. Because hazards and hazardous materials impacts would occur on a project-specific basis rather than a cumulative basis, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative along with other related projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.18 AIRPORT SAFETY

Phase 1–4a Projects

The potential for night lighting of project areas to affect aircraft operations is a function of the location of construction areas in relation to Airport Perimeter B and the runway approaches. Potential impacts of the Phase 1–4a Projects would be reduced through lighting restrictions and coordination with SCAS. The Phase 1–4a Projects’ potential to increase the possibility of collisions between aircraft and wildlife is a result of the location of construction areas in relation to the Airport Perimeter B and the runway approaches, and broad changes to managed land cover types in or near Airport Perimeter B. There are no other known projects that would affect lands within Airport Perimeter B; therefore, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

The Phase 4b Project would include night lighting in areas that could affect aircraft operations, depending on the location of construction areas in relation to Airport Perimeter B and the runway approaches. Potential impacts would be reduced through lighting restrictions and coordination with SCAS. The Phase 4b Project could potentially increase the possibility of collisions between aircraft and wildlife due to the proposed broad changes to managed land cover types in or near the Airport Perimeter B. There are no other known projects that would affect lands within the Airport Perimeter B, therefore the Phase 4b Project and related projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

5.1.5.19 WILDFIRE HAZARDS

Phase 1–4a Projects

For the Phase 1–4a Projects, mitigation would be implemented to minimize the potential for wildland fires. If a wildland fire outbreak occurs, the impacts would be localized and would not be expected to combine with the impacts of related projects. Wildfire hazard impacts would occur on a project-specific basis rather than a cumulative basis, and any such incidents would be isolated. Therefore, USACE and SAFCA determined that the Phase 1–4a Projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.

Phase 4b Project

Mitigation would be implemented to minimize the Phase 4b Project’s potential for wildland fires (Mitigation Measures 4.16-h). If a wildland fire outbreak occurs, the impacts would be localized and would not be expected to combine with the impacts of other projects. Because wildfire hazard impacts would occur on a project-specific basis rather than a cumulative basis, and any such incidents would be isolated, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative along with other related projects would not result in a cumulatively considerable incremental contribution to a cumulatively significant impact.
5.2 GROWTH INDUCEMENT

Both NEPA (40 CFR Sections 1508[a] and [b]) and CEQA (State CEQA Guidelines [CCR Section 15126.2(d)]) require an examination of the direct and indirect impacts of the proposed project, including the potential of the project to induce growth leading to changes in land use patterns and population densities and related impacts on environmental resources. Specifically, CEQA states that the EIR shall:

Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Direct growth inducement would result if a project involved construction of new housing. Indirect growth inducement would result, for instance, if implementing a project resulted in any of the following:

► substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises);

► substantial short-term employment opportunities (e.g., construction employment) that indirectly stimulates the need for additional housing and services to support the new temporary employment demand; and/or

► removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area).

Growth inducement itself is not an environmental effect, but it may foreseeably lead to changes in land use patterns and population densities and related impacts on environmental resources.

It is important to note that the project proponent(s) is not charged with the responsibility of weighing and balancing the benefits and burdens of growth in the Natomas Basin. Neither USACE nor SAFCA have authority to permit development in the Basin or to impose conditions on the development that is permitted. SAFCA is made up of five agencies, some of which have land use authority (City of Sacramento, Sacramento County, and Sutter County) and some of which do not (American River Flood Control District and Reclamation District 1000). However, SAFCA’s authority extends only to regional flood control matters because SAFCA is a joint powers agency and is limited to exercising powers common to all of its constituent members.

Local land use decisions are within the jurisdiction of the cities and counties within the project area: the City of Sacramento and Sacramento and Sutter Counties. Each of these agencies has adopted a general plan consistent with state law. These general plans provide an overall framework for growth and development within the jurisdiction of each agency, including the project area. Within the Natomas Basin, as elsewhere, population growth and urban development are also influenced by local, regional, and national economic conditions.

Because the Phase 4b Project would not involve the construction of housing, it would not be directly growth-inducing. Construction activities would generate short-term employment, but it is anticipated that the construction jobs would be filled using the existing local employment pool and project implementation would not directly
result in a population increase. The Phase 4b Project would accommodate growth currently planned for undeveloped lands in the Natomas Basin. These lands have been identified in the general plans and additional planning policy documents of the City of Sacramento and Sacramento and Sutter Counties as the areas most suitable for urban growth.

The approximately 9,038-acre North Natomas Community Plan (NNCP) area is designated in the City of Sacramento’s general plan as the city’s major growth area for new housing and employment opportunities (City of Sacramento 2009b). In 2000, the estimated population of the North Natomas area of Sacramento County was 1,082 people occupying 416 housing units (SACOG 2001). At buildout (year 2016), the NNCP estimates a population of 66,495 in the NNCP area occupying approximately 9,038 acres (City of Sacramento 2009a). As of September 14, 2005, the City of Sacramento had approved 12,162 lots for development of residential, commercial, and industrial land uses; 10,801 building permits; 11,599 single-family residential special permits; and 6,003 multifamily residential special permits for this area (City of Sacramento 2009a). SACOG estimates there were 14,865 persons living in the NNCP area and 5,368 housing units in the area in 2005, and projects that 45,040 persons will occupy 17,230 housing units in the NCCP area in 2025 (SACOG 2005).

The environmental consequences of buildout of the NNCP were addressed in the 1986 NNCP EIR (certified by the Sacramento City Council in May 1986), as well as in the 1993 Supplement to the 1986 NNCP EIR. Development within the NNCP started in 1999. More than 9,000 acres of the NNCP area were historically used for agriculture. While other long-term consequences of NNCP buildout would be mitigated by measures incorporated into the individual NCCP area projects, including measures to ensure consistency of development with the Natomas Basin Habitat Conservation Plan, loss of important farmland will remain a significant and unavoidable environmental impact of this growth. In addition, the 1986 NNCP EIR and the 1993 NNCP EIR Supplement found that the development of the NNCP area would itself have growth-inducing effects on the adjacent areas surrounding the NNCP area, likely leading to the conversion of additional agricultural land to urban uses (City of Sacramento 1993).

Another indicator of anticipated future growth of the Natomas area is the City/County North Natomas Joint Vision Plan (Joint Vision). The Joint Vision is a long-term agreement between the City and County of Sacramento to collaboratively manage growth and preservation of open space and habitat in the 10,000-acre portion of unincorporated Natomas in Sacramento County. The Joint Vision anticipates that a substantial portion of the Natomas area will become urbanized. Both jurisdictions determined that it would be mutually beneficial to cooperatively plan for the urbanization of the area in accordance with smart growth principles. Concepts for development include a mixture of residential densities, an industrial park, and open spaces throughout, particularly in the northern part of Natomas to separate development from the Sutter County boundary. To date, no land use plans have been adopted.

Finally, in addition to the NNCP and the Joint Vision, Sutter County voters in 2004 passed Measure M, an advisory measure intended to provide the Sutter County Board of Supervisors with an indication of public sentiment regarding the types and level of development in the 7,500-acre area of the South Sutter County Industrial/Commercial Reserve in the northern part of Natomas. The southern boundary of the Measure M area forms the Sutter/Sacramento county line. Measure M did not approve any specific development proposals, but provides guidance for future development in the form of the following parameters for the South Sutter area:

- at least 3,600 acres for commercial/industrial development;
- at least 1,000 acres for schools, parks, other public uses, and retail; and
- no more than 2,900 acres for residential development, with a population cap of 39,000.

Regional infrastructure planning reflects these growth plans. In December 2004, SACOG, representing the Counties of El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba and their 22 constituent cities, adopted the “Preferred Blueprint Scenario” to guide land use and transportation choices over the next 50 years as the region’s population grows from its current population of 2 million to include more than 3.8 million people. The Blueprint
The study found that continuing the recent practice of building large-lot, low-density housing would consume another 660 square miles of undeveloped land. Residents would face longer commutes, more vehicle trips, dirtier air, and a growing disconnect between where they live and where they work.

Through a series of Blueprint workshops at the neighborhood, city, county, and regional level, more than 5,000 residents, elected officials, business leaders, and environmental interests helped craft an alternative vision that integrates smart growth concepts such as higher-density, mixed-use developments and reinvestment in existing developed areas. The Preferred Blueprint Scenario assumes certain levels and locations of both "reinvestment" (i.e., additional development on already-built parcels) and greenfield development (i.e., large-scale development on vacant land), including development on the land in the Natomas area that would be protected by the Phase 4b Project (Plate 2-5). An analysis of this scenario showed that following smart growth principles would shorten future commute times, reduce traffic congestion, lessen dependence on automobiles, and provide for housing choices that more closely align with the needs of an aging population.

The Preferred Blueprint Scenario will become part of SACOG’s long-range transportation plan for the six-county region. It also will serve as a framework to guide local government in growth and transportation planning through 2050.

Using the above information, combined with an evaluation of residual flood damage, USACE and SAFCA have concluded that there is substantial evidence that the NLIP as a whole would accommodate anticipated growth in the project area in a manner that would be consistent with adopted local and regional growth management plans and with an the state’s emerging State Plan of Flood Control. The growth-inducing effects of the NBHCP were completely analyzed in the adopted and approved HCP EIR, which identified no growth-inducing effects associated with the creation and ongoing operation of the HCP (City of Sacramento 2002).

Based on the information presented above, there is substantial evidence that the Phase 4b Project would accommodate planned regional growth. Thus, the Phase 4b Project, while accommodating planned regional growth, is not growth inducing itself.

5.3 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

NEPA requires that an EIS include a discussion of the relationship between short-term uses of the environment and long-term productivity. Within the context of this EIS/EIR, “short-term” refers to the construction period, while “long-term” refers to the operational life of the project and beyond.

Project construction would result in short-term construction-related effects such as interference with local traffic and circulation, and increased air emissions, ambient noise levels, dust generation, and disturbance of wildlife. These effects would be temporary, occurring only during construction, and are not expected to alter the long-term productivity of the natural environment. Project implementation would also result in long-term effects, including permanent loss of farmland, changes in visual resources, and adverse effects on existing waters, wetlands, and woodland habitat.

Project implementation would also assist in the long-term productivity of the environment by improving the levee system that protects the Natomas Basin by reducing the Basin's overall flood risk. In addition, it would also preserve and improve, over the long term, important habitat upon which the Natomas Basin species of concern to USFWS and DFG depend, by increasing acreages, connectivity, and habitat quality of wetlands and other waters of the United States in the Basin.
These long-term beneficial effects of the Phase 4b Project would outweigh its potentially significant short-term impacts to the environment.

### 5.4 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

State CEQA Guidelines CCR Section 21100(b)(2)(A) provides that an EIR shall include a detailed statement setting forth “any significant effect on the environment that cannot be avoided if the project is implemented.” Chapter 4, “Environmental Consequences and Mitigation Measures,” provides a detailed analysis of all potentially significant, direct and indirect, environmental impacts of the Phase 4b Project, feasible mitigation measures that could reduce or avoid the project’s significant impacts, and whether these mitigation measures would reduce these impacts to less-than-significant levels. The Phase 4b Project’s significant cumulative impacts are discussed in Section 5.1, “Cumulative Impacts,” above. If a specific impact cannot be reduced to a less-than-significant level, it is considered a significant and unavoidable impact.

The Adjacent Levee Alternative (Proposed Action) would have the following significant and unavoidable environmental impacts (direct, indirect, and/or cumulative), which are presented in the order they appear in Chapter 4, “Environmental Consequences and Mitigation Measures”:

- conversion of Important Farmland to nonagricultural uses;
- conflicts with lands under Williamson Act\(^1\) contracts;
- inconsistency with Airport Master Plan, Airport Comprehensive Land Use Plan, and Airport Wildlife Hazard Management Plans;
- inconsistency with the American River Parkway Plan and Wild and Scenic Rivers Act;
- potential to physically divide or disrupt an established community;
- loss of landside and waterside woodland and SRA habitats;
- disruption to and loss of existing wildlife corridors;
- impacts on Swainson’s hawk and other special-status birds;
- potential damage or disturbance to known archaeological or architectural resources from ground-disturbance or other construction-related activities;
- potential damage to or destruction of previously unidentified or undiscovered cultural resources from ground-disturbance or other construction-related activities;
- potential discovery of human remains during construction;
- temporary and short-term increases in traffic on local roadways;
- temporary and short-term increases in traffic hazards on local roadways;
- generation of temporary and short-term construction noise;

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\(^1\) The California Land Conservation Act of 1965 is commonly known as the Williamson Act (California Government Code Section 51200 et seq.).
► temporary and short-term exposure of residents to increased traffic noise levels from truck hauling associated with borrow activity;

► effects related to the proposed Natomas Levee Class 1 Bike Trail Project (short-term: significant and unavoidable; long-term: less than significant [beneficial]);

► permanent disruption of recreational activities and facilities;

► alteration of scenic vistas, scenic resources, and existing visual character of the project area;

► new sources of light and glare that adversely affect views; and

► aircraft safety hazards resulting from project implementation.

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

► inconsistency with the Natomas Basin Habitat Conservation Plan;

► impacts on Successful Implementation of Habitat Conservation Plans; and

► temporary and short-term exposure of sensitive receptors to, or temporary and short-term generation of, excessive groundborne vibration.

Where feasible mitigation exists, it has been included to reduce these impacts; however, the mitigation would not be sufficient to reduce the impacts to a less-than-significant level.

### 5.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES AND ENERGY CONSERVATION

NEPA requires that an EIS include a discussion of the irreversible and irretrievable commitments of resources which may be involved should the project be implemented. Similarly, the State CEQA Guidelines require a discussion of the significant irreversible environmental changes that would be caused by the project should it be implemented.

The irreversible and irretrievable commitment of resources is the permanent loss of resources for future or alternative purposes. Irreversible and irretrievable resources are those that cannot be recovered or recycled, or those that are consumed or reduced to unrecoverable forms. Project implementation would result in the irreversible and irretrievable commitment of energy and material resources during project construction and maintenance, including the following:

► construction materials, including such resources as soil and rocks;

► land and water area committed to new/expanded project facilities; and

► energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that would be needed for project construction, operation, and maintenance.

The use of these nonrenewable resources is expected to account for only a small portion of the region’s resources and would not affect the availability of these resources for other needs within the region. Construction activities would not result in inefficient use of energy or natural resources.
CEQA further requires consideration of potential energy impacts of a proposed project (California Public Resources Code Section 21100[b][3]). Appendix F of the State CEQA Guidelines outlines issues related to energy conservation, and includes potential project description considerations, types of impacts applicable to energy use, and potential mitigation measures to reduce wasteful, inefficient, and unnecessary consumption of energy. According to CEQA, the goal of energy conservation implies wise and efficient use of energy, which can be accomplished by reducing energy consumption (e.g., natural gas and oil) and increasing reliance on renewable energy sources.

Energy used during project construction and operation would be expended in the form of electricity, gasoline, and diesel fuel, which would be used primarily by construction equipment and haul trucks during project construction and operation and maintenance activities (e.g., levee patrolling and flood fighting). As a result, ROG, NOX, and PM10 emissions associated with the use of fuels are directly related to energy consumption. While there are no significance thresholds available for analysis of energy consumption, as shown in Impact 4.11-a, “Temporary and Short-Term Emissions of ROG, NOX, and PM10,” and Impact 4.11-c, “Long-Term Changes in Emissions of ROG, NOX, and PM10 Associated with Project Implementation,” it is reasonable to conclude that energy use during construction would be considerable. Energy use for operations and maintenance activities would be similar compared to existing conditions. Mitigation Measure 4.11-a, “Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NOX, and PM10 during Construction,” includes reducing traffic speeds to 15 miles per hour on unpaved roads, and ensuring that equipment is properly tuned and maintained before and during on-site operation. Energy would be used wisely and efficiently during project construction and operation because air quality impacts would be mitigated to the extent feasible. Furthermore, the selected construction contractors would use the best available engineering techniques, construction and design practices, and equipment operating procedures. Finally, borrow sites have been selected to be located as close to levee construction as is feasible, which would reduce haul truck trip distances and, therefore, fuel consumption.

As described throughout this EIS/EIR, without implementation of the Phase 4b Project, the risk of levee failure would remain high. While a precise quantification of environmental impacts associated with potential levee failure is not possible, there is a potential for a variety of significant environmental impacts (see Table ES-1 for a summary of potential impacts). Levee failure and the resulting emergency and reconstruction efforts could expend more energy, overall, than construction of the Phase 4b Project. Thus, project implementation preempts potentially substantial future energy consumption, and is likely to result in long-term energy conservation.
6 COMPLIANCE WITH FEDERAL ENVIRONMENTAL LAWS AND REGULATIONS

This chapter summarizes the Federal environmental laws and regulations that apply to the Phase 4b Project, aside from NEPA, and describes the Phase 4b Project’s compliance with those laws and regulations. USACE, as the project proponent, would not only comply with the Federal environmental laws and regulations, but would comply with all state, regional, and local laws, regulations, and ordinances, which are described in the “Regulatory Setting,” of each individual issue area in Chapter 3, “Affected Environment.”

If SAFCA chooses to implement the Phase 4b Project without Federal participation, SAFCA would comply with all Federal, state, regional, and local laws, regulations, and ordinances, despite the fact that SAFCA is a joint-powers authority and is not subject to regional and local plans, policies, and ordinances.

Although the Federal laws and regulations described in this chapter apply to the NLIP, this chapter focuses on the status of compliance with the Federal environmental laws and regulations that pertain to the Phase 4b Project.

6.1 CLEAN WATER ACT (SECTION 404)

The U.S. Environmental Protection Agency (EPA) is the lead Federal agency responsible for water quality management. The Clean Water Act of 1972 (CWA) is the primary Federal law that governs and authorizes water-quality control activities by EPA as well as the states. Various elements of the CWA address water quality, as discussed below.

CWA Section 404 establishes a requirement for a project proponent to obtain a permit from USACE before engaging in any activity that involves discharge of dredged or fill material into “waters of the United States,” including wetlands. Fill material means material placed in waters of the United States where the material has the effect of replacing any portion of a water of the United States with dry land, or changing the bottom elevation of any portion of a water of the United States. Examples of fill material include but are not limited to rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, and material used to create any structure or infrastructure in waters of the United States. Waters of the United States include navigable waters of the United States; interstate waters; all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce; tributaries to any of these waters; and wetlands that meet any of these criteria or that are adjacent to any of these waters. Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three criteria: hydrophytic vegetation, hydric soil, and wetland hydrology. In addition, under Section 404, jurisdictional wetlands must: be adjacent to traditional navigable waters; directly about relatively permanent waters; or have a significant nexus with a traditional navigable water.

Before USACE can issue a permit under CWA Section 404, it must determine that the project is in compliance with the CWA Section 404(b)(1) Guidelines. The Section 404(b)(1) Guidelines specifically require that “no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences” (40 Code of Federal Regulations [CFR] Section 230.10[a]). To comply with this provision, the applicant is required to evaluate opportunities that would result in less adverse impact on the aquatic ecosystem. A permit cannot be issued for a project, therefore, in circumstances where a less environmentally damaging practicable alternative exists that would fulfill the project purpose.

An alternative is practicable if it is available and capable of being done after cost, existing technology, and logistics are taken into consideration in light of the overall project purpose as determined by USACE. If it is
otherwise a practicable alternative, an area not presently owned by the project applicant(s) that could reasonably be obtained, used, expanded, or managed to fulfill the purpose of the proposed activity may be considered.

As described in Chapter 1, “Introduction and Statement of Purpose and Need,” if Congress authorizes the Common Features GRR and Common Features/Natomas PACR, and USACE implements the Phase 4b Project (as is the preferred plan), a Section 404 permit would not be required because USACE would be the project proponent and USACE does not issue permits for USACE projects. However, if Congress does not provide authorization and SAFCA chooses to proceed with implementation of the Phase 4b Project without Federal participation, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require an individual permit from USACE under Section 404 of the CWA for the discharge of fill into waters of the United States, including wetlands. This EIS/EIR will be used to support USACE’s decision whether to grant SAFCA an individual permit for the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative.

Appendix D3 contains the Section 404(b)(1) evaluation.

6.2 RIVERS AND HARBORS ACT OF 1899, AS AMENDED

6.2.1 SECTION 14

Under Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] Section 408), referred to as “Section 408,” the Secretary of the Army, on the recommendation of the Chief of Engineers, may grant permission for the alteration of a Federal project levee by a non-Federal entity if the alteration is not injurious to the public interest and does not impair the usefulness of the project.

Similar to a Section 404 permit, if Congress authorizes the Common Features GRR and Common Features/Natomas PACR, and USACE implements the Phase 4b Project (as is the preferred plan), Section 408 permission would not be required because USACE would be the project proponent and USACE does not issue permits for USACE projects. However, if Congress does not provide authorization and SAFCA chooses to proceed with implementation of the Phase 4b Project without Federal participation, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require Section 408 permission. This EIS/EIR will be used to support USACE’s decision whether to grant SAFCA permission for the Phase 4b Project pursuant to Section 408.

6.2.2 SECTION 10

Under Section 10 of the Rivers and Harbors Act of 1899, work in, over, or under navigable waters of the United States is regulated by USACE. Navigable waters of the United States are defined as those waters subject to the ebb and flow of the tide shoreward to the mean high-water mark and those that are currently used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. The jurisdiction of USACE under CWA overlaps and extends beyond the geographic scope of its jurisdiction under the Rivers and Harbors Act. USACE permitting authority under the Rivers and Harbors Act is not subject to EPA oversight or any other restrictions specific to the CWA, and, in some cases the Rivers and Harbors Act alone will apply to waters. A permit from USACE is required prior to any work in, over, or under navigable waters of the United States.

As part of the Phase 4b Project, modifications to Sacramento City Sump Pump 160 and Reclamation District (RD) 1000 Pumping Plants Nos. 1A and 1B involve raising and extending discharge pipes, replacing or modifying pumps and motors, and performing other seepage remediation, including relocation of the stations away from the levee to accommodate raising the discharge pipes. These Phase 4b Project elements would be subject to permission from USACE under Section 10.
Similar to a Section 404 permit and Section 408 permission, if Congress authorizes the Common Features GRR and Common Features/Natomas PACR, and USACE implements the Phase 4b Project (as is the preferred plan), a Section 10 permit would not be required because USACE would be the project proponent and USACE does not issue permits for USACE projects. However, if Congress does not provide authorization and SAFCA chooses to proceed with implementation of the Phase 4b Project without Federal participation, implementation of either the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require a Section 10 permit. This EIS/EIR will be used to support USACE’s decision whether to grant SAFCA a Section 10 permit for the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative.

6.3 FISH AND WILDLIFE COORDINATION ACT OF 1934, AS AMENDED

The Fish and Wildlife Coordination Act (FWCA) ensures that fish and wildlife receive consideration equal to that of other project features for projects that are constructed, licensed, or permitted by Federal agencies. The FWCA requires that the views of the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the applicable state fish and wildlife agency (in this case, the California Department of Fish and Game [DFG]) be considered when impacts are evaluated and mitigation needs determined.

USACE is coordinating with USFWS, NMFS, and DFG to determine the effects of the Adjacent Levee Alternative (Proposed Action) on fish and wildlife in the project area. USFWS will prepare a FWCA report for the Phase 4b Project. USACE and SAFCA are providing USFWS, NMFS, and DFG with copies of this EIS/EIR for review and comment.

6.4 ENDANGERED SPECIES ACT OF 1973, AS AMENDED

Pursuant to the Federal Endangered Species Act (ESA), USFWS and NMFS have regulatory authority over Federally listed species. Under ESA, a permit to “take” a listed species is required for any Federal action that may harm an individual of that species. Take is defined under ESA Section 9 as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Under Federal regulation, take is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. ESA Section 7 outlines procedures for Federal interagency cooperation to conserve Federally listed species and designated critical habitat. Section 7(a)(2) requires Federal agencies to consult with USFWS and/or NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species.

SAFCA held meetings to discuss project features with USFWS during the NLIP alternatives formulation and CEQA compliance process (see Section 7.3, “Coordination with Other Federal, State, and Local Agencies”). USACE and SAFCA subsequently held informal consultation meetings in January through September 2008 to clarify project details and discuss information needs for ESA permitting.

In October 2008, a programmatic Biological Opinion (BO) was issued by USFWS for the NLIP with incidental take authorization for the Phase 2 Project; an amended BO was issued in May 2009 and appendages were issued in September 2009 and May 2010. These are included in Appendix D1. A Biological Assessment (BA) for the Phase 4b Project is under development; it will request incidental take authorization and will be appended to the programmatic BO. A BO is expected to be issued by USFWS for the Phase 4b Project. NMFS will either issue a BO or a Letter of Concurrence of Determination of Not Likely to Adversely Affect for the Phase 4b Project.

USACE and SAFCA are providing USFWS and NMFS with copies of this EIS/EIR for review and comment.
6.5 **MIGRATORY BIRD TREATY ACT OF 1918**

The Migratory Bird Treaty Act (MBTA) implements a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, “to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…” (16 USC Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

Compliance with the MBTA is being addressed through compliance with the ESA and the California Endangered Species Act (CESA). The Phase 4b Project incorporates mitigation measures that would help ensure that construction activities do not result in the take of migratory birds, as discussed in Section 4.7, “Biological Resources.”

6.6 **BALD AND GOLDEN EAGLE PROTECTION ACT OF 1940**

The Bald and Golden Eagle Protection Act provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds.

The Phase 4b Project area does not contain bald eagle or golden eagle nesting habitat, and the Phase 4b Project would not result in the take of bald or golden eagles. The Phase 4b Project incorporates mitigation measures that would ensure that construction activities do not result in the take of any raptors, as discussed in Section 4.7, “Biological Resources.”

6.7 **CLEAN AIR ACT OF 1963, AS AMENDED**

The Federal Clean Air Act (CAA) required EPA to establish national ambient air quality standards (NAAQS). EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM10), fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less (PM2.5), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP).

Under the CAA, the primary responsibility for planning for attainment and maintenance of the NAAQS rests with the state and local agencies. Accordingly, state and local air quality agencies are also designated as the primary permitting and enforcement authorities for most CAA requirements. During preparation of the Phase 2 EIR, the air management districts with jurisdiction over the project area, the Feather River Air Quality Management District (FRAQMD) and the Sacramento Metropolitan Air Quality Management District (SMAQMD), were given the opportunity to comment on the NLIP with regard to the scope and content of the Phase 2 EIR in relation to each agency’s statutory responsibilities and regulatory oversight of the project. In addition, FRAQMD was consulted through several written and verbal exchanges regarding its air emissions regulations. SMAQMD provided written comments on the Phase 2 EIR, and revisions to the air quality information were incorporated into the Phase 2 Final EIR based on this input.

The air quality effects analysis and associated mitigation measures in this EIS/EIR are consistent with the approach that was used in the Phase 2 EIS and EIR, Phase 3 EIS and EIR, and Phase 4a EIS and EIR. However, it is important to note that, for the Phase 4a Project, a conformity determination was not required for CEQA compliance and thus was not addressed in the FEIR. Under NEPA, however, the requirement for a conformity
determination was triggered due to the magnitude of construction-related activities and their potential to overlap. Thus, a conformity determination was prepared for the Phase 4a Project. Mitigation Measure 4.11-a in this EIS/EIR directs the project proponent(s) to implement control measures recommended by FRAQMD and SMAQMD to minimize temporary emissions of reactive organic gases (ROG), oxides of nitrogen (NOX), and PM10 during project construction, and comply with all applicable rules and regulations of FRAQMD and SMAQMD. As described under Impact 4.11-b, the Proposed Action (including implementation of proposed mitigation measures) would not exceed the EPA’s general conformity de minimis thresholds or hinder the attainment of air quality objectives in the local air basin with mitigation implementation.

USACE and SAFCA are providing FRAQMD and SMAQMD with copies of this EIS/EIR for review and comment.

6.8 NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800, as amended in 2004) require Federal agencies to consider the potential effects of their proposed undertakings on historic properties. Historic properties are cultural resources that are listed on, or are eligible for listing on, the National Register of Historic Places (NRHP) (36 CFR Section 800.16[l]). Undertakings include activities directly carried out, funded, or permitted by Federal agencies. Federal agencies must also allow the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the proposed undertaking and its potential effects on historic properties.

As noted in Section 2.8, “Cultural Resources,” inventories of all Phase 4b Project features that involve ground-disturbing work in native soils, including borrow locations, are ongoing; USACE and SAFCA will also complete evaluations, findings of effect, and treatment of identified resources where required. The project incorporates treatment measures to protect resources listed on or eligible for listing on the NRHP, as discussed in Section 4.8, “Cultural Resources.” Determinations of the specific mitigation measures to be implemented will be made by USACE and SAFCA in consultation with the SHPO as part of the determination and eligibility and effect process, as required by NHPA Section 106. Implementation of the selected mitigation measures will be ensured through the execution of a Programmatic Agreement (PA). Signatories to the PA are USACE, SAFCA, and the SHPO. The ACHP has been consulted and waived participation as a signatory to the PA.

The PA addresses the scope of the Area of Potential Effect (APE) and provides that the APE will be defined for each project phase. The APE for each phase will be submitted with the cultural resources inventory reports, and will be consulted upon by SHPO. If areas are added to the project development activities subsequent to the SHPO concurrence on the map of the APE for a specific phase, USACE and SAFCA will complete an inventory of historic properties within the expanded APE. If historic properties that would be adversely affected by the project are identified in cultural resources inventories, USACE and SAFCA will prepare a Historic Properties Treatment Plan (HPTP) for review and written approval by the SHPO for those specific properties. Areas of archaeological sensitivity will be monitored in accordance with the HPTPs. A final report documenting the results of work prepared under the HPTPs will be submitted to the SHPO. The PA provides for public notice and consultation with Native Americans and the public. The signed and executed PA is included in Appendix E1.

The regulations implementing Section 106 state that:

Compliance with the procedures established by an approved programmatic agreement satisfies the agency’s section 106 responsibilities for all individual undertakings of the program covered by the agreement until it expires or is terminated by the agency, the president of NCSHPO when a signatory, or the Council (36 CFR Section 800.14[b][2][iii]).
The regulations further clarify that execution of agreement documents under 36 CFR Section 800.6, *Resolution of Adverse Effects* (including programmatic agreements adopted under that section per 36 CFR Section 800.14[b][3]) evidence satisfaction of Section 106 (36 CFR Section 800.6[b][3]):

A memorandum of agreement executed and implemented pursuant to this section evidences the agency official’s compliance with section 106 and this part and shall govern the undertaking and all of its parts. The agency official shall ensure that the undertaking is carried out in accordance with the memorandum of agreement.

Thus, execution of the PA, which was prepared through the process provided in 36 CFR Section 800.6, evidences USACE’s compliance with Section 106. This does not mean that technical management activities under the PA are complete; they in fact are ongoing, as described above.

**Appendix E2** contains a number of documents that are part of the record demonstrating Section 106 compliance. These include the following:

- June 7, 2007, letter from SAFCA’s project archaeologist to the Native American Heritage Commission (NAHC) requesting a list of Native American individuals and organizations to contact regarding the project;
- June 19, 2007, response letter from the NAHC to SAFCA’s project archaeologist supplying a list of the requested individuals and organizations;
- June 21, 2007, letters from SAFCA’s project archaeologist to Native American individuals and organizations soliciting concerns and any information about cultural resources in the project area;
- July 9, 2007, telephone record of conversation between SAFCA’s project archaeologist and Rose Enos (referred to by the NAHC as “Miwok/Maidu”) regarding Ms. Enos’ general concern regarding avoidance of burial sites and request to be contacted if work is conducted on such sites;
- January 2008 letter (and enclosures) from USACE to the SHPO initiating Section 106 consultation;
- February 1, 2008, letter from USACE to the United Auburn Indian Community of Auburn regarding an invitation to participate as a concurring party in the PA (Note: this is an example of about 20 letters that were sent to tribal entities inviting them to participate in the PA);
- May 8, 2008, letter from Shingle Springs Rancheria to the SHPO, USACE, and SAFCA regarding comments on the Draft PA and a request for formal consultation;
- June 11, 2008, response letter from USACE to Shingle Springs Rancheria regarding May 8, 2008 letter;
- June 12, 2008, response letter from SAFCA to Shingle Springs Rancheria regarding May 8, 2008 letter and the June 4, 2008, meeting; and
- July 23, 2008, letter from SAFCA to the California Department of Water Resources (DWR) providing further agency and public notice of the PA, per Stipulation VI of the PA, Native American and Other Consultation and Public Notice. (Note: This is an example of letters that were sent to local municipalities, relevant state agencies, Native American individuals and organizations, and local preservation societies.)

While this record is not necessarily exhaustive, it documents the critical steps for Section 106 compliance completed by USACE.
6.9 AMERICAN INDIAN RELIGIOUS FREEDOM ACT

The American Indian Religious Freedom Act of 1978 is also applicable to Federal undertakings. This act established “the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions…including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites” (Public Law 95-431). Consultations with Native Americans to determine concerns regarding the Phase 4b Project are discussed in Section 7.2, “Native American Consultation.”

6.10 WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act (16 USC Section 1271 et seq.) establishes a National Wild and Scenic Rivers System for the protection of rivers with important scenic, recreational, fish and wildlife, and other values. Rivers are classified as wild, scenic, or recreational. The act designates specific rivers for inclusion in the System and prescribes the methods and standards by which additional rivers may be added. The lower American River is included in the System and is designated as “Recreational.”

The Phase 4b Project area includes a portion of the American River north levee, which is considered to be part of the Lower American River. Consistency of the Phase 4b Project with the Wild and Scenic Rivers Act is analyzed in Section 4.3, “Land Use, Socioeconomics, and Population and Housing.” The Phase 4b Project’s potential impacts to recreation uses of this portion of the river are discussed in Section 4.13, “Recreation.” The values for which the Lower American River was included in the System would not be adversely affected by the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative.

6.11 EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

Executive Order (EO) 11988, Floodplain Management (May 24, 1977), directs Federal agencies to issue or amend existing regulations and procedures to ensure that the potential effects of any action it may take in a floodplain are evaluated and that its planning programs and budget requests reflect consideration of flood hazards and floodplain management. The purpose of this directive is “to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.” Guidance for implementation of EO 11988 is provided in the floodplain management guidelines of the U.S. Water Resources Council (40 CFR Part 6030; February 10, 1978) and in A Unified National Program for Floodplain Management, prepared by the Federal Interagency Floodplain Management Task Force.

Recognizing that improving the Natomas Basin perimeter levee system would indirectly support population growth within the Basin, USACE in 1991 conducted extensive studies of the feasibility of constructing a cross-levee spanning the Basin from east to west to limit the extent of flood damage reduction improvements and associated floodplain development to the southern one-half to two-thirds of the Basin. The present study reconsidered a cross-levee measure. For the reasons described in Section 2.1.5, “Alternatives Considered, But Eliminated from Further Consideration,” this flood damage reduction alternative has been determined to be impracticable and unlikely to prevent the urbanization of the northern portion of the Basin without a very costly program for acquiring flowage easements and retiring development rights on the lands north of the cross levee. Consequently, improvements to the Natomas Basin perimeter levee system have been determined by USACE, the State, and SAFCA to be the feasible method of providing adequate flood damage reduction to existing development within the Basin and to the planned development. Although improving the perimeter levee system would fail to discourage further development within the Basin, this action is consistent with efforts by the State of California to comprehensively address floodplain development and flood risk on a regional scale. This comprehensive approach differentiates between flood damage reduction requirements for urbanized and nonurbanized floodplain areas, and will direct urban development away from those floodplains where a 200-year
level of flood risk reduction (0.005 annual exceedance probability [AEP]) cannot be achieved, while ensuring that this level of flood damage reduction is provided for already heavily populated areas such as the Natomas Basin.

The Phase 4b Project would reduce the risk of flood damage and minimize the impact of floods on human health, safety, and welfare by strengthening existing flood damage reduction infrastructure (see Section 4.5, “Hydrology and Hydraulics,” for a discussion of the methodology and analysis of the Phase 4b Project’s potential flood-related impacts). As noted in Section 2.7, “Residual Risk of Flooding,” implementation of the Phase 4b Project would substantially lessen the probability of a flood in the Basin due to levee failure; however, the Natomas Basin would remain subject to a residual risk of flooding under both of the action alternatives. USACE and SAFCA would be required to maintain an ongoing residual risk management program, as described in Section 2.7. The Phase 4b Project would also create natural habitat that would serve ecological functions associated with natural floodplains (see Section 2.3.4, “Habitat Creation”). Because there is no practicable, feasible alternative to the urban floodplain development indirectly associated with the project, USACE and SAFCA would maintain an ongoing residual risk management program and satisfy EO 11988, as described below.

In 1982, the Interagency Task Force on Floodplain Management published additional guidance on the implementation of EO 11988. Additional standards were developed to protect human safety, health, and welfare. These standards apply to “critical actions,” which are defined by the Water Resources Council Floodplain Management Guidelines as “any activity for which even a slight chance of flooding would be too great. The critical action floodplain is defined as the 500-year floodplain.”

To assist in determining whether a proposed action is a “critical action,” the following questions must be answered. If any answer is in the affirmative, a proposed action is considered a “critical action” and, therefore, subject to a higher standard.

► If flooded, would the proposed action create an added dimension to the disaster, as could be the case for liquefied natural gas terminals and facilities producing and storing highly volatile, toxic, or water-reactive materials?

► Given the flood warning lead-time available, would the occupants of buildings such as hospitals, schools, and nursing homes be insufficiently mobile to avoid loss of life and injury?

► Would essential and irreplaceable records, utilities, and/or emergency services be lost or become inoperative if flooded? (Interagency Task Force on Floodplain Management 1982.)

The NLIP is a program of levee improvements; it would not place sensitive land uses (e.g., hazardous materials storage facilities, senior care facilities, hospitals, schools, etc.) within a floodplain. Further, as described in Section 5.2, “Growth Inducement,” and elsewhere in this EIS/EIR, neither USACE nor SAFCA have any authority over what types of land uses would be placed in the Natomas Basin, with or without implementation of the NLIP. Therefore, USACE and SAFCA have concluded that the NLIP is not a “critical action.”

Notwithstanding USACE’s and SAFCA’s determination that the NLIP is not a “critical action” pursuant to EO 11988, the following eight-step process was followed as directed in the Water Resources Council Floodplain Management Guidelines for implementation of EO 11988 (these procedures are excerpted from USACE’s ER 1165-2-26). Responses follow in italics.

a) Determine if the proposed action is in the base flood plain.

Yes, the NLIP, of which the Phase 4b Project is a component, is a program of levee improvements in the Natomas Basin, which is in the 100-year floodplain.

b) If the action is in the base flood plain, identify and evaluate practicable alternatives to the action or to location of the action in the base flood plain as outlined in paragraph 7 above.
See Chapter 2, “Alternatives,” of this EIS/EIR. Also, see Appendix B1, “Alternatives Formulation and Screening Details.”

c) If the action must be in the flood plain, advise the general public in the affected area and obtain their views and comments.

Public involvement activities undertaken for the Phase 4b Project are described in Chapter 7, “Consultation and Coordination,” of this EIS/EIR. NEPA- and CEQA-required notices have been mailed to affected property owners throughout the NLIP environmental review process, soliciting input on the content of the environmental documents and noticing various public meetings. Additionally, notices have also been posted in the largest local newspaper, The Sacramento Bee, announcing various public meetings. USACE and SAFCA have also participated in numerous meetings and calls with affected property owners on an individual basis to discuss project-related concerns. Public comments received on the NOI/NOP will be considered and addressed, where appropriate in the DEIS/DEIR; public comments received on the DEIS/DEIR will be addressed in the FEIS/FEIR; and public comments received on the FEIS/FEIR will be addressed in the record of decision (ROD).

d) Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the base flood plain will affect the base flood plain, impacts resulting from these actions should also be identified.

Potential impacts associated with the Phase 4b Project are identified in Chapter 4, “Environmental Consequences and Mitigation Measures,” of this EIS/EIR. The Phase 4b Project also includes the creation of natural habitat that would serve ecological functions associated with natural floodplains (see Section 2.3.4, “Habitat Creation,” of the EIS/EIR). As stated above, the Phase 4b Project would be located within the Natomas Basin; no project components would be located outside of the Natomas Basin, with the exception of the Triangle Properties Borrow Area, which is located outside of but directly adjacent to the Basin because of its proximity to the NCC, PGCC, and NEMDC.

e) If the action is likely to induce development in the base flood plain, determine if a practicable non-flood plain alternative for the development exists, as outlined in paragraph 7, above.

See Chapter 5.2, “Growth Inducement,” of this EIS/EIR. The NLIP, including the Phase 4b Project, while accommodating planned regional growth, is not growth-inducing itself.

f) As part of the planning process under the Principles and Guidelines, determine viable methods to minimize any adverse impacts of the action including any likely induced development for which there is no practicable alternative and methods to restore and preserve the natural and beneficial flood plain values. This should include reevaluation of the “no action” alternative.

Mitigation measures are identified throughout this EIS/EIR and will be implemented as part of the Phase 4b Project to minimize the project’s potentially adverse impacts (see Chapter 4, “Environmental Consequences and Mitigation Measures,” of this EIS/EIR). As noted above, the Phase 4b Project includes the creation of natural habitat that would serve ecological functions associated with natural floodplains (see Section 2.3.4, “Habitat Creation,” of this EIS/EIR). The No-Action Alternative is described in Section 2.2, “No-Action Alternative,” of this EIS/EIR. Impacts of the No-Action Alternative are identified throughout Chapter 4, “Environmental Consequences and Mitigation Measures,” of this EIS/EIR.

g) If the final determination is made that no practicable alternative exists to locating the action in the flood plain, advise the general public in the affected area of the findings.
See response to Item c, above.

h) Recommend the plan most responsive to the planning objectives established by the study and consistent with the requirements of the Executive Order stated in paragraph 6 above.

The objectives of the NLIP are to: (1) provide at least a 100-year level of flood risk reduction (0.01 AEP) to the Natomas Basin as quickly as possible, (2) provide 200-year flood risk reduction (0.005 AEP) to the Basin over time, and (3) avoid any substantial increase in expected annual damages as new development occurs in the Basin. The NLIP, including the Phase 4b Project, is responsive to the EO 11988 objective of “avoidance, to the extent possible, of long- and short-term adverse impacts associated with the occupancy and modification of the base flood plain and the avoidance of direct and indirect support of development in the base flood plain wherever there is a practicable alternative” because it would not induce development in the floodplain (objective a); would reduce the hazard and risk associated with floods (objective b) thereby minimizing the impacts of floods on human safety, health, and welfare (objective c); and would restore and preserve the natural and beneficial values of the base floodplain (objective d).

6.12 EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

The purpose of EO 11990 is to “minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.” To meet these objectives, EO 11990 requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. EO 11990 applies to: acquisition, management, and disposition of Federal lands and facilities construction and improvement projects which are undertaken, financed, or assisted by Federal agencies; and Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities. USACE and SAFCA have taken actions to minimize project effects on wetlands where feasible and to create new wetlands as part of the project.

Implementation of the Phase 4b Project as proposed would ensure no-net-loss of aquatic resource function and services through SAFCA’s proposed compensatory mitigation, proposed in consultation and coordination with USACE. Wetlands and other waters of the United States that would be created as part of the project are described in Section 2.3.4, “Habitat Creation.” Wetlands that would be created as part of the project include marsh habitat in a portion of the Fisherman’s Lake Borrow Area after being reclaimed, for which USACE and SAFCA have developed a preliminary design.

6.13 EXECUTIVE ORDER 12898, FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

EO 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (59 Federal Register 7629 [1994]) requires Federal agencies to identify and address disproportionately high and adverse health or environmental effects on minority populations, low-income populations, and Native Americans that may result from any proposed action. The Council on Environmental Quality (CEQ) has oversight of the Federal government’s compliance with the EO. To facilitate compliance, CEQ prepared and issued, in association with EPA, “Environmental Justice Guidance under the National Environmental Policy Act” (CEQ December 1997). The Environmental Justice Guidance provides six principles by which environmental justice issues should be identified and addressed (CEQ 1997:9):

1. Consider the composition of the affected area to determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by the proposed action, and if so, determine if human health or environmental affects would be disproportionately high on those populations.
2. Consider relevant public health data and industry data concerning the potential for multiple or cumulative exposure to human health or environmental hazards including historical patterns of exposure to hazards.

3. Recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the action.

4. Develop effective public participation strategies.

5. Assure meaningful community representation in the process.

6. See tribal representation in the process.

While not currently residing in the NLIP area, including the Phase 4b Project, Native American tribes are known to have lived in the Natomas Basin in the past and there is evidence of their occupation of the Natomas Basin. The sites of occupation by Native American tribes are considered culturally significant and, therefore, are addressed in this EIS/EIR.

See Section 3.17 and 4.17, “Environmental Justice,” for more information on project effects on minority and low-income populations, as well as on Native American tribes.

### 6.14 FARMLAND PROTECTION POLICY ACT

The Natural Resources Conservation Service (NRCS) is the agency primarily responsible for implementing the Federal Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize Federal contributions to the conversion of farmland to nonagricultural uses by ensuring that Federal programs are administered in a manner compatible with state government, local government, and private programs designed to protect farmland.

NRCS administers the FPPA, which is a voluntary program that provides funds to help purchase development rights to keep productive farmland in agricultural uses. The program provides matching funds to state, local, or tribal government entities and nongovernmental organizations with existing farmland protection programs to purchase conservation easements. Participating landowners agree not to convert the land to nonagricultural uses and retain all rights to the property for future agriculture. A minimum 30-year term is required for conservation easements, and priority is given to applications with perpetual easements. NRCS provides up to 50% of the fair market value of the easement (NRCS 2004).

Implementation of the Adjacent Levee Alternative (Proposed Action) or Fix-in-Place Alternative would require converting areas of farmland along the Natomas Basin perimeter levee system to non-agricultural uses. Additional areas of farmland would be used as sources of soil borrow material. The topsoil on these lands would be retained and replaced after several feet of underlying soil is removed, and most of these lands would continue to be farmable, although some would be converted to marsh habitat. Mitigation intended to reduce project effects on farmland is included in this EIS/EIR. Also, the proposed modifications of the agricultural irrigation and drainage infrastructure included in the action alternatives would support the maintenance of agricultural practices on the west side of the Natomas Basin.

The project complies with the FPPA because it provides for mitigation of unavoidable direct conversion of agricultural land to nonagricultural uses, would provide infrastructure that would support the continuation of agricultural uses on the west side of the Natomas Basin, and is consistent with state and regional planning efforts that will protect farmland on a regional scale from development. Consultation with the NRCS (including submittal of the Farmland Conservation Impact Rating form) does not apply to Federal activities involving permitting and licensing (see 7 CFR Part 658) and therefore is not required for the project.
6.15 WILDLIFE HAZARDS ON OR NEAR AIRPORTS

The Federal Aviation Administration (FAA) addresses control of hazardous wildlife in Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* (FAA 2007). The FAA provides direction on where public-use airports should restrict land uses that have the potential to attract hazardous wildlife. FAA recommends a distance of 10,000 feet separating wildlife attractants and aircraft movement areas. The area within a 10,000-foot radius of the Airport Operations Area is designated as the Airport Perimeter B. The FAA definition of wildlife attractants in AC 150/5200-33B includes human-made or natural areas, such as poorly drained areas, retention ponds, agricultural activities, and wetlands. AC 150/5200-33B recommends against the use of Airport property for agricultural production within a 5-mile radius of the Airport Operations Area unless the income from the agricultural crops is necessary for the economic viability of the Airport.

Section 2.3.4.6, “Aviation Safety Components,” describes FAA’s regulatory interest in managing wildlife attractants within 5 miles of the edge of the Airport’s Area of Operations. Potential borrow sites within this area have been identified based on balancing multiple management priorities (including flood risk reduction, aviation safety, and habitat conservation) and minimizing the cost and environmental effects of borrow haulage activities. Within the Airport Perimeter B, management of the grasslands created by borrow operations would also be consistent with the Airport’s *Wildlife Hazard Management Plan* (Sacramento County Airport System 2007).

6.16 OBSTRUCTIONS AND AIRPORT LAND USE COMPATIBILITY

Part 77 of the Federal Aviation Regulations (FAR), “Objects Affecting Navigable Airspace,” has been adopted as a means of monitoring and protecting the airspace required for safe operation of aircraft and airports. Objects that exceed certain specified height limits constitute airspace obstructions. FAR Section 77.13 requires that the FAA be notified of proposed construction or alteration of certain objects within a specified vicinity of an airport, among them the following:

1. Any construction or alteration of more than 200 feet in height above the ground level at its site.

2. Any construction or alteration of greater height than an imaginary surface extending outward and upward at [a slope of] 100 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway of each [public-use airport, public-use airport under construction, or military airport] with a least one runway more than 3,200 feet in actual length, excluding heliports.

The FAA is serving as a cooperating agency under NEPA for the Phase 4b Project and is in regular communication with USACE and SAFCA regarding the project design and its potential effects on Airport property.

6.17 FEDERAL EMERGENCY MANAGEMENT AGENCY

6.17.1 LEVEE REQUIREMENTS

For a levee accredited by the Federal Emergency Management Agency (FEMA) as providing a 100-year level of flood risk reduction (0.01 AEP), the levee must be shown to satisfy several criteria, including protection of the embankment against erosion. Specific requirements are contained in 44 CFR Section 65.10.

6.17.2 FLOOD ZONE DESIGNATIONS

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk. These zones are depicted on a community’s Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. In January 2008, FEMA proposed remapping the Natomas
Basin as an AE zone, with the designation to take effect in December 2008. FEMA defines AE zones as areas with a 1% annual chance of flooding. The designation would result in the requirement that the bottom floor of all new buildings be constructed at or above base flood elevation—as little as 3 feet in some areas of Natomas but up to 20 feet above the ground level in much of the Basin. It is therefore anticipated that this designation would effectively stop any projects that are not issued building permits by the time the new map takes effect. An alternative to this designation, the A99 zone, may be applied where it can be shown that an area with a 1% annual chance of flooding will be protected by a Federal flood damage reduction system where construction has reached specified legal requirements. The main requirements are that 100% of the cost of the flood damage reduction system restoration project must be authorized, 60% must be appropriated, 50% must be expended, and “critical features” must be under construction and 50% completed (FEMA 2007). Construction is not constrained and there are no FEMA-specified building elevation requirements with an A99 designation. Mandatory flood insurance purchase requirements apply to both designations, however.

6.18 SUSTAINABLE FISHERIES ACT

In response to growing concern about the status of United States fisheries, Congress passed the Sustainable Fisheries Act of 1996 (Public Law [PL] 104-297) to amend the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265), the primary law governing marine fisheries management in the Federal waters of the United States. Under the Sustainable Fisheries Act, consultation is required by NMFS on any activity that might adversely affect essential fish habitat (EFH). EFH includes those habitats that fish rely on throughout their life cycles. It encompasses habitats necessary to allow sufficient production of commercially valuable aquatic species to support a long-term sustainable fishery and contribute to a healthy ecosystem. The Sacramento River and the lowermost segment of the NEMDC have been designated as EFH by the Pacific Fishery Management Council.

Phase 4b Project-related impacts to EFH in the Sacramento River are discussed in Section 4.7, “Biological Resources,” and mitigation measures are identified (see Impact 4.7-a, “Loss of Landside and Waterside Woodland and Shaded Riverine Aquatic Habitats”).

6.19 RESOURCE CONSERVATION AND RECOVERY ACT

The primary Federal agency regulating the generation, transport, and disposal of hazardous substances is EPA, under the authority of the Resource Conservation and Recovery Act (RCRA). RCRA established an all-encompassing Federal regulatory program for hazardous waste that is administered in California by the Department of Toxic Substances Control (DTSC). Under RCRA, DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments of 1984, which specifically prohibits the use of certain techniques for the disposal of various hazardous waste. The Federal Emergency Planning and Community Right-to-Know Act of 1986 imposes planning requirements to help protect local communities in the event of accidental release of an extremely hazardous substance.

Based on an extensive records search, one Cortese-listed site was identified within the Phase 4b Project construction footprint for Pumping Plant No. 8: the Olympian Oil site located at 4422 Northgate Boulevard (see Plate 2-14). Additionally, multiple sites were identified along the Sacramento River east levee with possible contamination issues. Other hazardous materials may exist within the Natomas Basin and/or may be brought in and used for project construction. The Phase 4b Project’s potential impacts related to hazards and hazardous materials are described in Section 4.16, “Hazards and Hazardous Materials.”

6.20 WORKER SAFETY REQUIREMENTS

The U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) is responsible at the Federal level for ensuring worker safety. OSHA sets Federal standards for implementation of workplace training,
exposure limits, and safety procedures for the handling of hazardous substances (as well as other hazards). OSHA also establishes criteria by which each state can implement its own health and safety program.

Implementation of the Phase 4b Project would create numerous employment opportunities, some of which may involve the handling of toxic, harmful, or hazardous substances as well as other hazards. The Phase 4b Project’s potential impacts related to exposure to hazardous materials are described under Impact 4.16-c in Section 4.16, “Hazards and Hazardous Materials.”

6.21 UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT

All or portions of parcels within the Phase 4b Project footprint would need to be acquired for project construction. Federal, state, local government agencies, and others receiving Federal financial assistance for public programs and projects that require the acquisition of real property, must comply with the policies and provisions set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in 1987 (42 USC Section 4601 et seq.) (Uniform Act), and implementing regulation, 49 CFR Part 24. Relocation advisory services, moving costs reimbursement, replacement housing, and reimbursement for related expenses and rights of appeal are provided for in the Uniform Act.

Phase 4b Project implementation would require acquisition of property in the Phase 4b Project footprint to construct flood damage reduction facilities and improvements. Additionally, temporary relocation of residents may occur during portions of construction (i.e., during 24/7 construction near residences). Property acquisition and relocation services, compensation for living expenses for temporarily relocated residents, and negotiations regarding any compensation for temporary loss of business would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

6.22 FEDERAL EARTHQUAKE HAZARDS REDUCTION ACT

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to “reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program.” To accomplish this, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives.

NEHRP’s mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improvement of building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improvement of mitigation capacity; and accelerated application of research results. The NEHRPA designates FEMA as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and the U.S. Geological Survey.

The closest active fault to the Natomas Basin is located approximately 15 miles to the northwest, as shown in Table 3.4-1. Because there are no active faults within or near the Phase 4b Project footprint, the risk of fault ground rupture is low. In addition, geotechnical investigations of borrow materials and flood risk reduction improvements are designed in consideration of the longevity of the levee system, including secondary seismic hazards such as shaking, liquefaction, subsidence, and seiches.
7 CONSULTATION AND COORDINATION

This chapter summarizes public and agency involvement activities undertaken by USACE and SAFCA that have been conducted to date, are ongoing, and/or will be conducted for this project, and which satisfy NEPA and CEQA requirements for public scoping and agency consultation and coordination.

Additionally, Native American consultation activities are described.

7.1 PUBLIC INVOLVEMENT UNDER NEPA AND CEQA

7.1.1 NOTICE OF INTENT, NOTICE OF PREPARATION, AND SCOPING MEETINGS

USACE published the notice of intent (NOI) to prepare the American River Common Features General Re-evaluation Report (GRR) EIS in the Federal Register (Vol. 73, No. 41) on February 29, 2008. A series of public scoping meetings were held in March 2008 to present information to the public and to receive public comments on the scope of the EIS. There is no mandated time limit to receive written comments in response to the NOI under NEPA. Because the Natomas PACR/Phase 4b Project is a component of the American River Common Features GRR, a separate NOI for the Natomas Post-authorization Change Report (PACR)/Phase 4b Project does not need to be re-issued. Appendix A1 contains the NOI, the one comment letter received in 2008 (which is also summarized in Table 7-1), and copies of the posters for the March 2008 scoping meetings.

<table>
<thead>
<tr>
<th>Written Comments Received on the NOI</th>
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<tbody>
<tr>
<td>Commenter</td>
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<tr>
<td></td>
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<tr>
<td>California Department of Transportation</td>
</tr>
<tr>
<td>▶ Requests clarification as to which portions of the project will use trucks to haul materials and which will use waterside barges for hauling materials.</td>
</tr>
<tr>
<td>▶ Requests a Traffic Management Plan including necessary mitigation, haul routes, dates of operation, and truck trip volumes be prepared in order for review.</td>
</tr>
<tr>
<td>▶ Notes that an encroachment permit will be required if electronic warning signs will be used within State right-of-way at work sites to warn public of trucks entering or leaving state highways.</td>
</tr>
<tr>
<td>▶ Expresses concern about piezometer locations and wells near the subgrade section of I-5 (the Boat Section) and requests these sites be identified and not be disturbed during levee improvement.</td>
</tr>
<tr>
<td>▶ Requests maps describing the project “activity areas” and clarification of the scope of the project and potential impacted highway and bridge structure areas.</td>
</tr>
<tr>
<td>▶ Requests identification and notification of any work near State right-of-way.</td>
</tr>
</tbody>
</table>

Note: I-5 = Interstate 5
Source: Data Compiled by AECOM in 2009

On November 5, 2009, SAFCA issued a notice of preparation (NOP) for this EIS/EIR. In addition to the State Clearinghouse’s distribution of the NOP to potentially interested state agencies, copies of the NOP were distributed to approximately 900 recipients, including Federal, state, regional, and local agencies; non-profit and private organizations; homeowners associations; partnerships; businesses; and individual residents in the project area to solicit input as to the scope and content of this EIS/EIR (see Section 7.4, “List of Recipients”). Because the distribution list likely did not account for all affected parties in the Phase 4b Project footprint, USACE and SAFCA published a notice in The Sacramento Bee on November 5, 2009. The NOP was circulated for a 30-day public comment period, in accordance with the State CEQA Guidelines, which closed on December 4, 2009. Appendix A2 contains the NOP and comment letters received.
A joint NEPA/CEQA public scoping meeting was held on November 18, 2009 from 4:30 to 6:30 p.m. at the South Natomas Community Center in Sacramento, California, to brief interested parties on the Natomas PACR/Phase 4b Project and obtain the views of agency representatives and the public on the scope and content of this EIS/EIR. Copies of the posters for the November 18th scoping meeting are also included in Appendix A2.

Verbal and written comments were received during the scoping meeting, and additional written comments from agencies and individuals were received throughout the CEQA scoping period. All comment letters received during the scoping period are included in Appendix A2 and are summarized in Table 7-2.

Table 7-2
Written Comments Received on the NOP

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Agencies</td>
<td></td>
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</tr>
<tr>
<td>Federal Aviation Administration</td>
<td>December 2, 2009</td>
<td>Expresses concern regarding creation of habitat near the Airport that could potentially attract wildlife hazardous to aviation and increase wildlife-aircraft collision strikes. Requests that the EIS/EIR analyze whether the proposed improvements and mitigation measures are consistent with the guidelines in FAA AC 150/5200-33B. Recommends that a wildlife biologist meeting the requirements of FAA AC 150/5200-36 <em>Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments</em> (June 28, 2006) be included in the team conducting the analysis. Recommends that the EIS/EIR select an alternative that includes managing vegetation on NLIP areas within 10,000 feet of the Airport so as to minimize its attractiveness to hazardous wildlife and minimize the potential for wildlife-aircraft collisions. Recommends that SAFCA and USACE contact SCAS regarding the County’s efforts to minimize the attractiveness of the Airport to wildlife potentially hazardous to aircraft. Requests a paper copy and CD of the DEIS/DEIR when it is released for public review.</td>
</tr>
<tr>
<td>State Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State of California Governor’s Office of Planning and Research, State Clearinghouse and Planning Unit</td>
<td>November 5, 2009</td>
<td>Courtesy notice that specifies that responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency.</td>
</tr>
<tr>
<td>California Highway Patrol</td>
<td>December 3, 2009</td>
<td>Expresses concern regarding the project’s adverse effects on traffic using Garden Highway and adjacent roadways. Expresses concern for higher volume of traffic caused by detours on West El Camino Avenue, Richards Boulevard, SR 160, and I-80.</td>
</tr>
<tr>
<td>Local Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento County Airport System</td>
<td>December 3, 2009</td>
<td>States that SCAS has nothing new to add to what SCAS has conveyed previously.</td>
</tr>
<tr>
<td>Sacramento County Department of Transportation</td>
<td>November 25, 2009</td>
<td>Expresses concern that truck haul routes on rural roadways will create a significant impact and shorten the life of the pavement. Asks that a maintenance agreement with SACDOT’s Maintenance and Operations Section be negotiated. Requests that the proposed roadway closure and detour plans be coordinated with SACDOT. States that the project would result in a change of geometrics at the side street intersections with Garden Highway at Powerline Road and San Juan Road and requests proposed improvement plans be coordinated with SACDOT. Requests that power pole relocation be coordinated with SMUD and SACDOT to avoid conflicts with the intended bike/pedestrian path.</td>
</tr>
<tr>
<td>Sacramento Metropolitan Air Quality Management District</td>
<td>November 18, 2009</td>
<td>Confirms receipt of NOP and indicates that an NOP comment letter will not be provided.</td>
</tr>
</tbody>
</table>
### Table 7-2
**Written Comments Received on the NOP**

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Sutter County, Community Services Department  | November 23, 2009 | - Requests the project’s impacts to the proposed borrow site excavation and reclamation area east of the NCC and east Natomas Basin levee be analyzed based on its classification as Prime Farmland and Farmland of Statewide Importance by the California Department of Conservation.  
- Requests that the reclamation of this site be to a use consistent with the County’s Agriculture, 80-acre minimum General Plan designation (AG-80) and General Agricultural Zoning District (AG).  
- States that removal of soil from proposed borrow sites is subject to SMARA and that a permit and reclamation plan is required to be approved by Sutter County.  
- Recommends that SMARA be analyzed as part of the proposed environmental document and all feasible and effective mitigation be incorporated into the project.  
- Requests analysis of potential impacts on Sankey Gap.  
- Requests analysis of impacts on Pleasant Grove Cemetery and that feasible mitigation be incorporated into the project.  
- Requests that the impacts to the “Out of Basin Mitigation Area” or “Area B” be evaluated and potential mitigation land be analyzed.  
- Requests to be provided with all future notices regarding this project. |
| Sutter County, Public Works Department         |              | - Requests an addendum to the Roadway Repairs Agreement dated August 21, 2009 due to the addition of the Triangle Properties Borrow Area and possible impacts to Fifield Road and Keys Road used as haul routes.  
- Advises that a bridge rehabilitation project will begin in May 2010 on Pleasant Grove Road south of Keys Road causing traffic to possibly detour onto Keys Road and Fifield Road not allowing the contractor for borrow operations to use “wider than legal” equipment on these county roads. |
| City of Sacramento, Parks and Recreation Department | December 1, 2009 | - Notes the existence of several parks bordered by Garden Highway in Reaches A:16-20 including Park Site SN2 (Undeveloped; APN 274-0220-047); Shorebird Park (Developed; APN 274-0560-024 and 025); Natomas Oaks Park (Developed: APN 274-0320-023 and 033, 274-0050-033); Sand Cove Park (Developed; APN 274-0020-064, 274-0220-066, and 022), and McClellan Docks (Developed; APN 274-0030-020).  
- Requests that each of the above parks be addressed and anticipated impacts assessed. In the event of unavoidable impacts related to access, tree removal/relocation (SN2) mitigation options are requested.  
- Requests discussion of Gardenland Park (along NEMDC South) regarding access, shrinkage of acreage, and impacts to the planned improvements specified in the master plan approved in March 2009.  
- Requests Fisherman’s Lake Park and Open Space be included in discussion.  
- Requests notification when the DEIS/DEIR is available to review. |
| City of Sacramento, Department of Transportation | December 4, 2009 | - States that prior to beginning of construction, a “Construction Traffic Control Plan” for the City of Sacramento streets should be prepared by the project proponent to the satisfaction of the City Traffic Engineer and subject to review by all affected agencies and a copy submitted to local emergency response agencies at least 14 days prior to commencement of construction that may partially or fully obstruct roadways.  
- Notes that an encroachment permit will be required for all work within the public right-of-way, specifically for reconstruction of intersections and roadways.  
- Identifies specific parcels related to possible impacts to mature heritage trees, bike trails, city parks, city streets, pump stations, and emergency access roads and requests they be evaluated for impacts.  
- Requests that the DEIS/DEIR discuss the degree of change to the bike trail on the NEMDC levee and any detour routes or changes to access points.  
- Requests clarity on any possible modifications to the bike trail along the West Canal (I-80 to San Juan Road) and provision of mitigation if necessary.  
- Poses the following questions regarding the Natomas Levee Recreational Trail Project: Will the trail be continuous and a paved Class I bikeway at the conclusion of the project? Will the trail replace existing bike trails? Will this trail provide connection to existing bike trails that lead to and from the project site? Will construction of the paved surface require local jurisdictions to provide funding? If so, how will this be addressed?  
- Requests that the City of Sacramento review the trail construction plans to ensure compliance with established standards and that locations where the trail crosses city streets will need detailed planning to ensure safe crossings. |
Table 7-2
Written Comments Received on the NOP

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Date</th>
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<tbody>
<tr>
<td>Garden Highway Community Association</td>
<td>December 4, 2009</td>
</tr>
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</table>

- Expresses concern and states that SAFCA and USACE have not considered all alternatives based on an unbiased study to determine the most economically and environmentally sound project design for the NLIP and is therefore in violation of CEQA and NEPA requirements.
- States that “SAFCA and its contractors are in a race to remove highly sensitive habitat within the entire project footprint, despite the fact that alternative, less obtrusive levee improvement designs are gaining momentum and the fact that the Project is facing insurmountable fiscal problems.”
- Suggests that SAFCA and USACE consider alternative designs to accomplish the necessary flood protection, the goal being to lessen the monetary, environmental, and property-loss cost.
- States that 500-foot-wide berms are overkill and should be able to be reduced significantly and still achieve adequate flood protection.
- States that analysis of existing conditions must be evaluated measured against the “real conditions on the ground.”
- States that a baseline of environmental conditions be established for the change in environmental conditions to be evaluated.
- States that the project plans fail to describe the existing physical environmental conditions to determine the significant adverse impacts on the existing environment but rather use a hypothetical computer model.
- States that there is a lack of evaluation of current levee and canal conditions.
- Requests that new Federal rules such as the more frequent flooding of the Yolo Bypass be considered in the plans including incorporating lowering of Sacramento River weirs as a long-term solution.
- Notes previous DFG comments in support of the idea that wildlife including woodlands, threatened and sensitive species habitat, and waters of the United States are not adequately considered and long-term mitigation may not be sufficient.
- Notes that the promise of creating 3 acres of woodland for each 1 acre destroyed does not consider the growing period for the new woodland.
- Suggests that SAFCA and its contractors are moving ahead with clear-cutting without funding in place for the planned mitigation.
- Expresses concern about the existence of an agreement between SAFCA and TNBC regarding post-reclamation land use of borrow sites.
- States that SAFCA and USACE have not evaluated the simultaneous multi-phase construction, which would be unreasonably harmful to wildlife, the environment, and Garden Highway residents.
- Expresses concern over the current position regarding encroachments and description regarding proposed action on the landside and waterside of the levee.
- Requests encroachments slated for removal be identified specifically.
- Expresses concern about proposed 24/7 construction and challenges whether it is justifiable.
- States a failure to address impacts to businesses along Garden Highway.
- Expresses concern over possible increased flood risk to waterside land owners within the NLIP area.
- Requests USACE divulge their position and methods of evaluating the possible increased flood risk to waterside properties.
- Expresses concern over changes in property values.
- Expresses concern about planned development after completion of the NLIP.
- States failure of NOP to mention the settlement agreement between SAFCA and GHCA.
- Expresses concern about methods used to obtain right-of-entry agreements from private property owners along Garden Highway.
- Requests that any further right-of-entry agreements be accompanied by a notification to the property owner as to “the legal authority upon which the agency relies, along with a full description of the associated rights afforded the property owners.”
- “Objects to the ‘taking’ of private lands pursuant to the Eminent Domain laws under the guise that these lands are necessary for the development of the Project, when in fact the involved agency actually and surreptitiously plans to convey the condemned land to another private party, i.e., the airport.”
- Concern as to the proposed funding mechanism related to the Natomas Levee Recreational Trail Project.
### Table 7-2
**Written Comments Received on the NOP**

<table>
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<tr>
<th>Commenter</th>
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<tbody>
<tr>
<td>Sacramento Area Bicycle Advocates</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Expresses appreciation that the Phase 4b Project includes the Natomas Levee Recreational Trail Project and notes benefits it will have on the community.</td>
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<tr>
<td>► Notes adverse impacts to existing bicycle routes for recreational and utilitarian purposes including Garden Highway and its intersecting streets and Ueda Parkway bike trail along the NEMDC.</td>
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<tr>
<td>► Suggests mitigation for these impacts including alternative bicycle access through or adjacent to construction areas, proper advance signage for detours or route changes, access to bicycle devices at traffic signals, signage for vehicle operators to ensure safety of bikers, maximum vehicle speed limits of 25 mph where separate bicycle lanes cannot be provided, and advance development of Traffic Control Plans that show traffic control measures for bicyclists with the plans reviewed and approved before construction begins and noticing to bicycle-interest organizations in the Sacramento area.</td>
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<tr>
<td>► Suggests establishing connections to the Ueda Parkway bike trail to Indiana Avenue, Senator Avenue, Rosin Court, Tandy Court, and North Market Boulevard during reconstruction.</td>
<td></td>
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<tr>
<td>Individuals</td>
<td></td>
</tr>
<tr>
<td>Dan Kaufman</td>
<td>November 9 and December 4, 2009</td>
</tr>
<tr>
<td>► Requests clarification as to why property located north of Sankey Road to Howsley Road is not identified as a potential borrow site.</td>
<td></td>
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<tr>
<td>► Requests notification of proposed plans related to this property.</td>
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<tr>
<td>Shirley and Robert Wallace</td>
<td>November 10, 2009</td>
</tr>
<tr>
<td>► Requests clarification as to the extent of the identified “new potential borrow site” located on their property bordering Fifield Road in Pleasant Grove, Sutter County.</td>
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<tr>
<td>Michael and Sara Johnson</td>
<td>November 25, 2009</td>
</tr>
<tr>
<td>► Expresses concern about property value dropping as a result of construction.</td>
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<tr>
<td>► Expresses concern regarding negative effects of proposed 24/7 construction on their family’s health and well being.</td>
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<tr>
<td>► Expresses concern regarding unlivable conditions during construction and possible consequences.</td>
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<tr>
<td>► Expresses concern about lack of advanced notification to Swainson Way residents.</td>
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<tr>
<td>► Requests direct communication with homeowners on Swainson Way regarding levee improvements and construction impacts.</td>
<td></td>
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<tr>
<td>Phil Perry</td>
<td>December 2, 2009</td>
</tr>
<tr>
<td>► Expresses concern about waterside vegetation preservation.</td>
<td></td>
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<tr>
<td>► Expresses concern about cutoff walls and levee degradation related to moisture content in soil.</td>
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<tr>
<td>► Requests a more specific design to identify the limits and evaluate the project’s impacts.</td>
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<tr>
<td>► Requests clarification on modifications to pumping plants, specifically Pumping Plant No. 1.</td>
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<tr>
<td>► Expresses concern about proposed 24/7 construction in residential areas.</td>
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<tr>
<td>► States that vouchers for temporary housing during 24/7 construction are insufficient.</td>
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<tr>
<td>► States that a 250-foot-wide seepage berm is infeasible in the heavily populated Reach A:19B.</td>
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<tr>
<td>► Expresses concern that new work does not have a “discernable difference in flood protection from what SAFCA proposed back in the mid 1990s.”</td>
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<tr>
<td>► Questions the need for additional work on the levee based on the <em>Natomas Levee Program Update</em> (March 20, 2008).</td>
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<tr>
<td>► Requests re-evaluation of plans to avoid overbuilding the levee in residential areas.</td>
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</tr>
<tr>
<td>Javed Siddiqui</td>
<td>December 2, 2009</td>
</tr>
<tr>
<td>► Expresses concern for preservation of historic, cultural, environmental, and economic value and benefits of resources potentially affected.</td>
<td></td>
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<tr>
<td>► Requests review and inclusion of <em>The Sacramento Bee</em> article about Heritage Oaks.</td>
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<tr>
<td>► Requests review of letters dated November 11 and 12, 2009.</td>
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<tr>
<td>► Requests that alternate option for seepage trench be explored to lessen the levee footprint.</td>
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<td>Table 7-2</td>
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<tr>
<td><strong>Written Comments Received on the NOP</strong></td>
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<tr>
<td><strong>Commenter</strong></td>
<td><strong>Date</strong></td>
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<tr>
<td>Kevin McRae</td>
<td>December 3, 2009</td>
</tr>
<tr>
<td>► Requests that vegetation removal within the levee right-of-way be minimized especially related to the taking of Heritage Oaks and waterside riparian habitat.</td>
<td></td>
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<tr>
<td>► Requests that USACE be sensitive to homeowner concerns regarding waterside encroachments.</td>
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<tr>
<td>► Requests that power poles be relocated to the landside as much as is practical for the safety and aesthetic concerns of residents.</td>
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<tr>
<td>► Requests that waterside residence structures (gates, fences, driveways) be modified or removed as little as possible.</td>
<td></td>
</tr>
<tr>
<td>Roger Sherman</td>
<td>December 3, 2009</td>
</tr>
<tr>
<td>► Requests that April 2009 amendments to the State CEQA Guidelines for greenhouse gas emissions be discussed.</td>
<td></td>
</tr>
<tr>
<td>► Expresses concern about the level of evaluation and impact analysis related to Heritage Oak trees in Reach A:16.</td>
<td></td>
</tr>
<tr>
<td>Robert Orr</td>
<td>December 3, 2009</td>
</tr>
<tr>
<td>► Expresses concern and requests elimination or significant mitigation of Garden Highway closures, 24/7 construction activities, destruction of landside encroachments (oak groves), and destruction of waterside encroachments (valley oaks).</td>
<td></td>
</tr>
<tr>
<td>Dr. Del Wright and Patricia E. Nealon</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Expresses concern about Heritage Oaks slated for destruction.</td>
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<tr>
<td>► Requests that Javed Siddiqui’s alternate plans be evaluated before the project moves forward.</td>
<td></td>
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<tr>
<td>Ed and Patti Bronder</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Echoes comments submitted by Dr. Del Wright and Patricia E. Nealon.</td>
<td></td>
</tr>
<tr>
<td>Melissa Brown</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Agrees and joins in concerns raised by GHCA, Mr. Sherman, and Mr. Siddiqui.</td>
<td></td>
</tr>
<tr>
<td>► Expresses concern about emergency vehicle access to 2317 Garden Highway (Reach A:16).</td>
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</tr>
<tr>
<td>► Expresses concern as to impacts to well water quality, 24/7 construction impacts on Garden Highway; health impacts (asthma complications related to dust, diesel, and gasoline fumes); noise impacts; lighting during dusk and dawn hours; decrease in property value and tax implications; the denuding of the levees (and property and surrounding property); environmental impact to natural access to the river by wildlife (deer, squirrels, raccoons, possums, skunks, fox, beavers, hawks, owls, magpies, hummingbirds, ducks, geese and other birds, bees, butterflies, and other insects); appropriate mitigation for homeowners loss of quiet enjoyment of homes; and reduced value during construction.</td>
<td></td>
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<tr>
<td>► Expresses concern about slurry wall clean-up methods.</td>
<td></td>
</tr>
<tr>
<td>Josh W. Harmatz</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Notes agreement with comments of fellow residents and GHCA.</td>
<td></td>
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<tr>
<td>► Specifically mentions preserving trees on the landside and waterside of the levee.</td>
<td></td>
</tr>
<tr>
<td>Richard and Judee Myers</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Notes agreement with comments of fellow residents and GHCA.</td>
<td></td>
</tr>
<tr>
<td>Tyson M. Shower</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Notes agreement with comments of fellow residents and GHCA.</td>
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<tr>
<td>► Notes concern regarding permitted encroachments (i.e., well, propane tank, and driveway).</td>
<td></td>
</tr>
<tr>
<td>► Notes obligation to SAFCA or USACE to be responsible for any relocation expenses that may occur.</td>
<td></td>
</tr>
<tr>
<td>Melvin Borgman</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Asks how Sankey Gap and overflow of water particularly to the east side of the WP/SP Railroad at high-water events will be addressed.</td>
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<tr>
<td>► Asks to what elevation PGCC and NEMDC will be raised.</td>
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<tr>
<td>► Asks how erosion repair and rock slope protection will affect upstream water levels at PGCC and NEMDC. Will materials placed on the waterside of the levee increase water levels upstream?</td>
<td></td>
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<tr>
<td>► States that culverts along the PGCC are the only means of drainage for the areas between the WP/SP Railroad and the PGCC.</td>
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Table 7-2
Written Comments Received on the NOP

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<tr>
<th>Commenter</th>
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<tbody>
<tr>
<td>Vicki Pfingst and Susan Fast</td>
<td>December 4, 2009</td>
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<tr>
<td>► Expresses concern that fill material added to the waterside of the NCC south levee will restrict the westerly flow of water and increase uplift and lateral forces on bridges. Offers possible solutions including reinforced concrete overlay on levee surface, extending down to firm subsoil and excavating additional material under bridges to facilitate flow.</td>
<td></td>
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<tr>
<td>► Suggests using borrow sites for retention ponds for storm runoff and suggests deepening the NCC and PGCC to reduce flooding in areas upstream and using this material for borrow.</td>
<td></td>
</tr>
<tr>
<td>► Suggests that any material or structures placed waterside on the levee (Sacramento River left bank) will increase water levels upstream.</td>
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</tr>
<tr>
<td>► Suggests additional/alternative actions to be included in the project including: improvements to the Yolo Bypass, levee setbacks at a minimum of 1,000 feet to provide more width to channels and lowering water levels in the river, removal of levees from “islands” created in the Delta and East Bay estuaries, and reduction or curtailment of discharge of drainage water into the river system during periods of high water.</td>
<td></td>
</tr>
<tr>
<td>► Notes the project’s probable environmental impacts including increased risk of flooding in south Sutter County, particularly Pleasant Grove and damages that may be associated with such risk.</td>
<td></td>
</tr>
<tr>
<td>► Notes visual impacts to raising levees.</td>
<td></td>
</tr>
<tr>
<td>► Expresses concern about adequately addressing impacts of the project on surrounding communities.</td>
<td></td>
</tr>
<tr>
<td>Vicki Pfingst and Susan Fast</td>
<td>December 4, 2009</td>
</tr>
<tr>
<td>► Agrees with comments from fellow residents and GHCA.</td>
<td></td>
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<table>
<thead>
<tr>
<th>Ronald Johnson</th>
<th>December 4, 2009</th>
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<tbody>
<tr>
<td>► Requests further information, limits, and right-of-way acquisition extent related to project design.</td>
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<tr>
<td>► Requests clarification on means to save Heritage Oaks and suggests eliminating seepage berms east of the I-80 Bridge.</td>
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<tr>
<td>► Requests clarification on waterside vegetation removal.</td>
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<tr>
<td>► Requests limits on noise and light pollution related to Garden Highway construction.</td>
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<tr>
<td>► States that 24/7 construction is unacceptable related to cutoff walls and suggests using double and triple crews instead.</td>
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<tr>
<td>► States that proposed power pole relocation from top of levee to bottom of slope is unacceptable and suggests burying them at shallow depths along the road serving the riverfront parcels.</td>
<td></td>
</tr>
<tr>
<td>► Requests clarification of impacts at “Tim Lewis” specific to the oak tree stand at west end of the reach, confirmation of the treatment for the top of the berm, and beautification at the 12-foot-wide transition slope that would extend to the sidewalk.</td>
<td></td>
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<tr>
<td>► Requests a design plan at Reaches A:19A and 19B showing the bike trail plans.</td>
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Socping Meeting

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<thead>
<tr>
<th>Manuel Jardin</th>
<th>November 18, 2009</th>
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<tbody>
<tr>
<td>► Expresses concerns about the use of haul roads including Powerline, Del Paso, and San Juan Roads and requests that at least one of these remain open to the public and not be used as a haul road at any given time to avoid public interaction with large trucks.</td>
<td></td>
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<tr>
<td>► Requests that trucks used for hauling not be equipped with a compression break to reduce noise pollution.</td>
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<thead>
<tr>
<th>Kieth Seegmiller</th>
<th>November 18, 2009</th>
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<tr>
<td>► Expresses concern about the lead agency switching from SAFCA to USACE and losing contact with local agencies.</td>
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<thead>
<tr>
<th>Charlotte Borgman</th>
<th>November 18, 2009</th>
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<tbody>
<tr>
<td>► Expresses concern about increased water drainage to the east of the Natomas Basin and requests clarification of drainage plans.</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Airport = Sacramento International Airport; EIS/EIR = environmental impact report/environmental impact statement; FAA = Federal Aviation Administration; AC = Airport Circular; NLIP = Natomas Levee Improvement Program; SAFCA = Sacramento Area Flood Control Agency; USACE = U.S. Army Corps of Engineers; SCAS = Sacramento County Airport System; DEIS/DEIR = draft environmental impact report/draft environmental impact statement; NOP = notice of preparation; SR = State Route; I-80 = Interstate 80; SACDOT = Sacramento County Department of Transportation; SMUD = Sacramento Municipal Utility District; NCC = Natomas Cross Canal; SMARA = State Surface Mining and Reclamation Act; APN = Assessor’s Parcel Number; PGCC = Pleasant Grove Creek Canal; NEMDC = Natomas East Main Drainage Canal; CEQA = California Environmental Quality Act; NEPA = National Environmental Policy Act; DFG = California Department of Fish and Game; TNBC = the Natomas Basin Conservancy; 24/7 = 24 hours per day, 7 days a week; GHCA = Garden Highway Community Association; WP/SP = Western Pacific/Southern Pacific

Source: Data Compiled by AECOM in 2009
7.1.2 Other Public Outreach Activities

To help the community stay informed about current project activities, information is provided in a variety of ways:

- USACE and SAFCA each maintain Web sites (http://www.spk.usace.army.mil and http://www.safca.org/Programs_Natomas.html, respectively) that contain public documents related to the NLIP. Additionally, SAFCA’s Web site contains public notices, project maps, schedule updates, news articles, SAFCA Board of Directors meeting agendas and meeting summaries, and other project-related materials;

- SAFCA periodically mails Executive Director Updates to property owners located adjacent to the NLIP project footprint;

- NLIP updates are provided at the monthly SAFCA Board of Directors meetings, which typically occur on the third Thursday of each month. These meetings are held at the Sacramento County Board of Supervisors Chambers at 700 H Street, Sacramento, California, 95814 and begin at 3:00 p.m.; and

- SAFCA has held several meetings with landowner groups and other interest groups during conceptual project design and will continue to meet with these groups to address concerns and interests.

7.1.3 Major Areas of Controversy

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

- temporary, construction-related effects (especially noise and access issues) on residents and businesses adjacent to the project levees (including potential 24/7 construction);

- the hydraulic modeling used to analyze the project’s hydraulic impacts;

- construction-related impacts on cultural and biological resources;

- vegetation and tree removal and relocation of utilities, including power poles;

- removal of agricultural lands and loss of opportunity for future development; and

- SAFCA’s ability to fund mitigation measures.

The first two issues were the subject of a lawsuit, filed in December 2007, by the Garden Highway Community Association challenging the Phase 2 EIR prepared by SAFCA, which was settled. A copy of the settlement agreement is included as Appendix A3, and applies to all affected Garden Highway residents. Many of the agreements made by SAFCA in this settlement agreement regarding construction practices also have been incorporated into the Phase 3–4a Projects or, as appropriate, in the mitigation measures for those project phases. SAFCA intends to voluntarily apply the design and construction provisions in the agreement to all Sacramento River east levee components of the Phase 4b Project in the event that SAFCA chooses to implement the Phase 4b Project without Federal participation. While USACE is not bound by the settlement agreement, USACE nevertheless plans to implement some of the measures contained therein; these measures are incorporated into the project or reflected, as appropriate, in the mitigation measures in this EIS/EIR.
Other issues, including potential 24/7 construction, vegetation and tree removal, relocation of utilities (including power poles), and impacts to agricultural lands have been raised in comment letters by affected property owners. USACE and SAFCA have and will continue to respond to these issues, most recently in responses to comments on the Phase 4a FEIS and FEIR. Additionally, USACE and SAFCA continues to work individually with these property owners to respond to concerns.

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

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

7.1.4 ADDITIONAL STEPS IN THE ENVIRONMENTAL REVIEW PROCESS

In accordance with NEPA and CEQA review requirements, this EIS/EIR is being distributed for public and agency review and comment for a 45-day period. This distribution ensures that interested parties have an opportunity to express their views regarding the significant environmental effects and other aspects of the project, and to ensure that information pertinent to permits and approvals is provided to the decision makers of USACE, SAFCA, NEPA cooperating agencies, and CEQA responsible and trustee agencies. This document is available for public review during normal business hours at the following locations:

► USACE, Sacramento District office: 1325 J Street, Sacramento, California;
► SAFCA: 1007 7th Street, 7th Floor, Sacramento, California;
► Sacramento Central Library: 828 I Street, Sacramento, California; and
► Sutter County Library: 750 Forbes Avenue, Yuba City, California.

Additionally, this document can be viewed at USACE’s and SAFCA’s Web sites at http://www.spk.usace.army.mil and http://www.safca.org/Programs_Natomas.html, respectively.

A public meetings will be held before the SAFCA Board of Directors on July 15, 2010 at 3:00 p.m. in the Sacramento City Council Chambers located at 915 I Street, Sacramento, California. In addition, written comments from the public, reviewing agencies, and stakeholders will be accepted throughout the public comment period.

Following public review of the DEIS/DEIR, a joint FEIS/FEIR will be prepared, in which USACE and SAFCA will provide responses to comments on the DEIS/DEIR. The FEIS/FEIR will constitute a reprint of the entire DEIS/DEIR, and will include comment letters, responses to comments, and any text changes/clarifications. The FEIS/FEIR will be issued for a 30-day review period.

The SAFCA Board of Directors will then consider certifying the EIR if it is determined to be in compliance with CEQA, and will rely on the certified EIR when considering project approval. To support a decision on the project, the SAFCA Board of Directors must prepare and adopt written findings for each significant environmental impact identified in the EIR; a Statement of Overriding Considerations, if needed; and a Mitigation Monitoring and Reporting Program (MMRP) to ensure implementation of the mitigation measures and project revisions, if any, identified in the EIR. Following EIR certification and project approval, a Notice of Determination (NOD) documenting the decision will be issued.
Following the 30-day review period, USACE will consider the Phase 4b Project and issue its record of decision (ROD). The ROD will identify USACE’s decision regarding the alternatives considered, address substantive comments received on the FEIS, and determine whether the Adjacent Levee Alternative (Proposed Action) complies with Sections 408, 404, and 10.

7.2 NATIVE AMERICAN CONSULTATION

7.2.1 SECTION 106 COMPLIANCE

USACE is the lead agency for Native American consultation under NEPA. On May 1, 2008, the California State Historic Preservation Officer (SHPO) signed the Programmatic Agreement (PA) among USACE, SAFCA, and the SHPO, regarding the issuance of permission under the authority of Sections 408 and 404 for the NLIP Landside Improvements Project. USACE consulted the Ione Band of Miwok Indians, the Shingle Springs Band of Miwok Indians, and the United Auburn Indian Community, and invited them to concur in this PA. On June 23, 2008, the Central Valley Flood Protection Board concurred in the PA. The PA envisioned that preparation of inventory reports for consultation between USACE and the SHPO for identification of Areas of Potential Effect (APEs) would be based on project phases. USACE, SAFCA, and the SHPO compiled a list of members of the interested public who were provided notice of this PA. The Section 106 process requires that USACE make good faith efforts to identify and take into account the opinions and preferences of local Native Americans with cultural ties to the APE, as well as the public for historic preservation actions taken in accordance with the PA. Native American monitors have been assisting SAFCA in the treatment of Native American human remains and items associated with Native American burials discovered during project activities in accordance with California Public Resources Code Section 5097.98 and California Health and Safety Code Section 7050.5(b) and 7050.5(c).

In April 2008, in response to requests from the project archaeologists, the Native American Heritage Commission (NAHC) identified a Most Likely Descendant (MLD) for the project, Mr. John Tayaba of the Shingle Springs Rancheria. Mr. Tayaba was designated as the MLD because he is a member of the Shingle Springs Band of Miwok Indians, and the Tribe’s aboriginal territory includes the NLIP project area. Mr. Tayaba is being consulted with in regard to the disposition of prehistoric remains encountered in preliminary archaeological investigations in the project area. Shingle Springs Rancheria is a Federally recognized tribe and is actively participating in consultation regarding the identification and treatment of cultural resources subject to Section 106 of the National Historic Preservation Act.

In implementing the provisions of the PA, USACE archaeologists, SAFCA, AECOM archaeologists, and tribal representatives meet biweekly to discuss project progress, and the general approach to inventory, evaluation, and treatment of cultural resources for the project. Discussions include specific consideration of preferred construction methods from a tribal perspective, and treatment of identified and significant resources. Section 106 consultation is ongoing, and conducted in close coordination with Native Americans.

7.2.2 NATIVE AMERICAN CONSULTATION UNDER CEQA

SAFCA is the lead agency for Native American consultation under CEQA. During the scoping period for the Phase 2 Project, EDAW/AECOM (now AECOM) sent a letter of inquiry to the NAHC on June 12, 2007, asking for information or concerns regarding the project area, as well as a list of individuals or organizations that might have information or concerns regarding the project area. On June 19, 2007, Debbie Pilas-Treadway of the NAHC responded and indicated that no known sites were found in the Sacred Lands File that were located within the project area or in the immediate vicinity. Ms. Pilas-Treadway also provided a list of individuals who could be contacted concerning cultural resources in the project area. These individuals were sent contact letters on June 21, 2007, with information regarding the proposed project and a request for any information they might provide or concerns that they might have about the project. No written responses were received; therefore, follow-up phone calls were made on July 9, 2007. Only one individual, Rose Enos (referred to by the NAHC as “Miwok/Maidu”), answered. Ms. Enos expressed general concern regarding avoidance of burial sites and asked to be contacted if
work is conducted on such sites. Phone messages were left for the remaining people on the contact list; however, no response from any of these individuals was received. The correspondence is included in Appendix E2.

In addition, Randy Yonemura of the Ione Band of the Miwok was contacted in January 2008 for information on areas of concern. Mr. Yonemura led an archaeologist on a field visit of the project area and provided anecdotal information on areas of potential Native American burials. Since spring 2008, Native American monitors have been observing archaeological field efforts, as appropriate, and offering insight and advice regarding cultural resources finds. USACE and SAFCA continue to consult closely with the MLD designated under California Public Resources Code 5097.98 regarding the effect of the NLIP on cultural resources of concern to the Native American community.

7.3 COORDINATION WITH OTHER FEDERAL, STATE, REGIONAL, AND LOCAL AGENCIES

Chapter 6, “Compliance with Federal Environmental Laws and Regulations,” describes the project’s compliance with applicable Federal laws and regulations, including consultation to date with various agencies. The following briefly summarizes these consultation and coordination efforts.

7.3.1 COORDINATION WITH THE FEDERAL AVIATION ADMINISTRATION AND THE SACRAMENTO COUNTY AIRPORT SYSTEM

The Federal Aviation Administration (FAA) is acting as a cooperating agency under NEPA for the Phase 4b Project. USACE and SAFCA met with the FAA and the Sacramento County Airport System (SCAS) on September 10, 2008, regarding project features within the Sacramento International Airport (Airport) north bufferlands. The FAA and SCAS have noted that the Airport has developed the Airport’s Wildlife Hazard Management Plan (WHMP), with which the Phase 4b Project would comply, to the extent practicable and feasible, to ensure aviation safety. Further, the FAA and SCAS have expressed concern that the project, if inappropriately designed, could change existing vegetation and wildlife habitat in ways that could attract wildlife hazardous to aviation safety and increase wildlife-aircraft collisions.

SCAS provided comments on the Phase 4a DEIS/DEIR, to which USACE and SAFCA responded in the Phase 4a FEIS and FEIR, respectively. Additionally, the FAA provided a comment letter in response to the Phase 4b NOP. The FAA continues to be involved in reviewing environmental documents related to the Landside Improvements Project. USACE and SAFCA meet with the FAA as needed to discuss design of project components as it relates to the Airport and to ensure that the project would not interfere with implementation of the WHMP.

7.3.2 RESOURCE AGENCY COORDINATION

Over the course of project planning and environmental review for the NLIP Landside Improvements Project, USACE and SAFCA have coordinated informally with the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), the California Department of Fish and Game (DFG), and The Natomas Basin Conservancy (TNBC). Table 7-3 includes permits and other resource agency coordination activities for past and current NLIP project phases. A copy of the programmatic Biological Opinion and USACE Jurisdictional Determinations are included in Appendix D.
## Table 7-3
### NLIP Resource Agency Coordination

<table>
<thead>
<tr>
<th>Agency</th>
<th>Permit/Authorization/Approval</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programmatic</strong></td>
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</tr>
<tr>
<td>USFWS</td>
<td>Programmatic Biological Opinion</td>
<td>Issued October 2008; Amendment issued May 2009; Appendage issued September 2009; Appendage issued May 2010</td>
</tr>
<tr>
<td>DFG, Central Valley RWQCB, USACE, and USFWS</td>
<td>Long-Term Management Plan Approval</td>
<td>Granted May 2009</td>
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<tr>
<td><strong>Phase 2 Project</strong></td>
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<tr>
<td>USACE</td>
<td>Section 408 Permission</td>
<td>Granted January 2009</td>
</tr>
<tr>
<td>USACE</td>
<td>Section 404 Permit</td>
<td>Issued January 2009; amendment issued May 2009(^2); 2(^{nd}) amendment issued August 2009; 3(^{rd}) amendment issued February 2010</td>
</tr>
<tr>
<td>Central Valley RWQCB</td>
<td>Section 401 Water Quality Certification</td>
<td>Issued January 2009</td>
</tr>
<tr>
<td>DFG</td>
<td>Section 2081 Incidental Take Authorization</td>
<td>Issued May 2009</td>
</tr>
<tr>
<td>NMFS</td>
<td>Concurrence of Determination of Not Likely to Adversely Affect</td>
<td>January 2009</td>
</tr>
<tr>
<td>DFG</td>
<td>Section 1602 Streambed Alteration Agreement</td>
<td>Issued January 2009</td>
</tr>
<tr>
<td>USFWS</td>
<td>Biological Opinion</td>
<td>Issued October 2008; Amendment issued May 2009</td>
</tr>
<tr>
<td>USFWS</td>
<td>Fish and Wildlife Coordination Act Report</td>
<td>October 2008</td>
</tr>
<tr>
<td>Sacramento County</td>
<td>SMARA Exemption</td>
<td>Granted February 2009</td>
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<td>Sutter County</td>
<td>SMARA Exemption</td>
<td>Granted February 2009</td>
</tr>
<tr>
<td>DFG, Central Valley RWQCB, USACE, and USFWS</td>
<td>Mitigation and Monitoring Plan</td>
<td>Approval granted May 2009</td>
</tr>
<tr>
<td>SWRCB</td>
<td>Section 402 NPDES General Construction Permit</td>
<td>Notice of Intent filed March 2009</td>
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<tr>
<td><strong>Phase 3 Project(^3)</strong></td>
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<tr>
<td>USACE</td>
<td>Section 408 Permission</td>
<td>Granted April 2010</td>
</tr>
<tr>
<td>USACE</td>
<td>Section 404 Permits(^3)</td>
<td>Phase 3a permit received October 2009; Phase 3b permit received April 2010</td>
</tr>
<tr>
<td>USACE</td>
<td>Section 10 Permit</td>
<td>Phase 3a permit received October 2009; Phase 3b permit received April 2010</td>
</tr>
<tr>
<td>Central Valley RWQCB</td>
<td>Section 401 Water Quality Certifications(^3)</td>
<td>Certifications received in September 2009 for Phase 3a and January 2010 for Phase 3b</td>
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<tr>
<td>DFG</td>
<td>Section 2081 Incidental Take Authorization</td>
<td>In preparation, authorization anticipated Spring 2010</td>
</tr>
<tr>
<td>DFG</td>
<td>Section 1602 Streambed Alteration Agreement(^4)</td>
<td>Landslide canal footprint agreement received September 2009; later stages received February–April 2010</td>
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</table>
### Table 7-3
**NLIP Resource Agency Coordination**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Permit/Authorization/Approval</th>
<th>Status</th>
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<tbody>
<tr>
<td>USFWS</td>
<td>Biological Opinion</td>
<td>Issued September 2009</td>
</tr>
<tr>
<td>NMFS</td>
<td>Concurrence of Determination of Not Likely to Adversely Affect (Phase 3b and 4a combined)</td>
<td>January 2010</td>
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<tr>
<td>USFWS</td>
<td>Fish and Wildlife Service Coordination Act Report</td>
<td>Draft received June 2009; final received October 2009</td>
</tr>
<tr>
<td>Sacramento County</td>
<td>SMARA Exemption</td>
<td>Exemption granted November 2009</td>
</tr>
<tr>
<td>DFG, Central Valley RWQCB, USACE, and USFWS</td>
<td>MMP</td>
<td>Approved by USACE September 2009; approved by all other agencies October 2009</td>
</tr>
<tr>
<td>SWRCB</td>
<td>Section 402 NPDES General Construction Permit</td>
<td>Notice of Intent submitted November 2009</td>
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#### Phase 4a Project

<table>
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<tr>
<th>Agency</th>
<th>Permit/Authorization/Approval</th>
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<tr>
<td>USACE</td>
<td>Section 408 Permission</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>USACE</td>
<td>Section 404 Permit</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>USACE</td>
<td>Section 10 Permit</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>Central Valley RWQCB</td>
<td>Section 401 Water Quality Certification</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>DFG</td>
<td>Section 2081 Incidental Take Authorization</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>DFG</td>
<td>Section 1602 Streambed Alteration Agreement</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>USFWS</td>
<td>Biological Opinion</td>
<td>Issued May 2010</td>
</tr>
<tr>
<td>NMFS</td>
<td>Concurrence of Determination of Not Likely to Adversely Affect (Phase 3b and 4a combined)</td>
<td>January 2010</td>
</tr>
<tr>
<td>USFWS</td>
<td>Fish and Wildlife Service Coordination Act Report</td>
<td>May 2010</td>
</tr>
<tr>
<td>Sacramento County</td>
<td>SMARA Permit and Exemption</td>
<td>Exemption granted November 2009 for most of the Fisherman’s Lake Borrow Area, including Novak; Sacramento County determined that the northeastern corner of the Fisherman’s Lake Borrow Area (called the Natomas Urban Development site) would require a SMARA permit</td>
</tr>
<tr>
<td>DFG, Central Valley RWQCB, USACE, and USFWS</td>
<td>Mitigation and Monitoring Plan</td>
<td>Anticipated August 2010</td>
</tr>
<tr>
<td>SWRCB</td>
<td>Section 402 NPDES Permit</td>
<td>Anticipated August 2010</td>
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#### Phase 4b Project

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<th>Agency</th>
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<th>Status</th>
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<tr>
<td>USACE</td>
<td>Section 408 Permission</td>
<td>Would only be required for the Phase 4b Project if Federal authorization is not obtained and SAFCA chooses to proceed with Phase 4b Project implementation without Federal participation. Under this scenario, anticipated spring 2011</td>
</tr>
<tr>
<td>Agency</td>
<td>Permit/Authorization/Approval</td>
<td>Status</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>USACE</td>
<td>Section 404 Permit</td>
<td>Would only be required for the Phase 4b Project if Federal authorization is not obtained and SAFCA chooses to proceed with Phase 4b Project implementation without Federal participation. Under this scenario, anticipated spring 2011</td>
</tr>
<tr>
<td>USACE</td>
<td>Section 10 Permit</td>
<td>Would only be required for the Phase 4b Project if Federal authorization is not obtained and SAFCA chooses to proceed with Phase 4b Project implementation without Federal participation. Under this scenario, anticipated spring 2011</td>
</tr>
<tr>
<td>Central Valley RWQCB</td>
<td>Section 401 Water Quality Certification</td>
<td>Anticipated spring 2011</td>
</tr>
<tr>
<td>DFG</td>
<td>Section 2081 Incidental Take Authorization</td>
<td>Anticipated spring 2011</td>
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<tr>
<td>DFG</td>
<td>Section 1602 Streambed Alteration Agreement</td>
<td>Anticipated spring 2011</td>
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<tr>
<td>USFWS</td>
<td>Biological Opinion</td>
<td>Anticipated spring 2011</td>
</tr>
<tr>
<td>NMFS</td>
<td>Biological Opinion or Concurrence of Determination of Not Likely to Adversely Affect</td>
<td>Anticipated spring 2011</td>
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<tr>
<td>USFWS</td>
<td>Fish and Wildlife Service Coordination Act Report</td>
<td>Anticipated spring 2011</td>
</tr>
<tr>
<td>Sacramento County</td>
<td>SMARA Permit or Exemption</td>
<td>Anticipated spring 2011</td>
</tr>
<tr>
<td>DFG, Central Valley RWQCB, USACE, and USFWS</td>
<td>Mitigation and Monitoring Plan</td>
<td>Anticipated spring 2011</td>
</tr>
<tr>
<td>SWRCB</td>
<td>Section 402 NPDES Permit for General Construction</td>
<td>Anticipated spring 2011</td>
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</tbody>
</table>

Notes: USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; DFG = California Department of Fish and Game; RWQCB = Regional Water Quality Control Board; USACE = U.S. Army Corps of Engineers; SMARA = Surface Mining and Reclamation Act; SWRCB = State Water Resources Control Board; NPDES = National Pollutant Discharge Elimination System

1 Although Phase 1 Project permitting and regulatory requirements were fulfilled, they are not included in this table because construction is complete.

2 The Phase 2 Project Section 404 permit was amended based on the Amended Phase 2 Biological Opinion.

3 The Phase 3 Project Section 404 permit and 401 certification has been separated into 2 subphases (a and b).

4 The Phase 3 Project DFG 1602 Streambed Alteration Agreement will be separated into multiple stages.

Source: Data compiled by AECOM in 2009

### 7.4 LIST OF RECIPIENTS

The following elected officials and representatives; government departments and agencies; non-profit organizations, partnerships, private organizations, and businesses; media; and individual property owners received a copy of the DEIS/DEIR.
7.4.1 Elected Officials and Representatives

- Doris Matsui, Congresswoman, 5th Congressional District
- Tom McClintock, Congressman, 4th Congressional District
- Roger Dickinson, Sacramento County Supervisor, District 1
- Jimmie Yee, Sacramento County Supervisor, District 2
- Susan Peters, Sacramento County Supervisor, District 3
- Roberta MacGlashan, Sacramento County Supervisor, District 4
- Don Nottoli, Sacramento County Supervisor, District 5
- James Gallagher, Sutter County Supervisor, District 5
- Mayor Kevin Johnson, Sacramento City Council
- Ray Tretheway, Sacramento City Council, District 1
- Sandy Sheedy, Sacramento City Council, District 2
- Steve Cohn, Sacramento City Council, District 3
- Rob Fong, Sacramento City Council, District 4
- Lauren Hammond, Sacramento City Council, District 5
- Kevin McCarty, Sacramento City Council, District 6
- Robbie Waters, Sacramento City Council, District 7
- Bonnie Pannell, Sacramento City Council, District 8
- William Kristoff, West Sacramento City Council

7.4.2 Government Departments and Agencies

United States Government

- Bureau of Indian Affairs, Pacific Regional Office
- Federal Aviation Administration
- Federal Emergency Management Agency, Region IX
- National Marine Fisheries Service
- Natural Resources Conservation Service
- U.S. Bureau of Reclamation, Central Valley Operations
- U.S. Coast Guard
- U.S. Department of Agriculture, National Rural Development Council
- U.S. Environmental Protection Agency, Division 9
- U.S. Fish and Wildlife Service

Tribal Government

- Shingle Springs Rancheria

State of California

State agencies that will receive the EIS/EIR via the State Clearinghouse are marked (*)

- California Bay-Delta Authority
- California Air Resources Board*
- California Department of Boating and Waterways, Regulations Unit
- California Department of Conservation*
- California Department of Education*
- California Department of Fish and Game, Region 2
- California Department of General Services*
- California Department of Health Services*
► California Department of Transportation, District 3*
► California Department of Toxic Substances Control*
► California Department of Water Resources
► California Environmental Protection Agency
► California Integrated Waste Management Board*
► California Regional Water Quality Control Board, Central Valley Region*
► Central Valley Flood Protection Board
► Native American Heritage Commission
► Office of Emergency Services*
► Office of Historic Preservation, State Historic Preservation Officer
► Office of Planning and Research, State Clearinghouse
► State Lands Commission, Division of Environmental Planning and Management
► State Water Resources Control Board*

REGIONAL, COUNTY, CITY, AND OTHER LOCAL AGENCIES

► Amador County
► American River Flood Control District
► Butte County
► Central Valley Flood Control Association
► City of Davis
► City of Sacramento
► City of Sacramento Department of General Services
► City of Sacramento Department of Parks and Recreation
► City of Sacramento Department of Transportation Engineering Services
► City of Sacramento Department of Utilities
► City of Stockton
► City of West Sacramento
► City of Woodland
► Colusa County
► Contra Costa County
► El Dorado County
► Feather River Air Quality Management District
► Natomas Central Mutual Water Company
► Natomas Unified School District
► Placer County
► Placer County Water Agency
► Port of Sacramento
► Reclamation District 150
► Reclamation District 307
► Reclamation District 537
► Reclamation District 730
► Reclamation District 785
► Reclamation District 900
► Reclamation District 999
► Reclamation District 1000
► Reclamation District 1001
► Reclamation District 1500
► Reclamation District 1600
► Reclamation District 2035
► Reclamation District 2068
► Regional Water Authority
7.4.3 **Non-Profit Organizations, Partnerships, Private Organizations, and Businesses**

- Alamar Restaurant
- APCO Worldwide
- Association for the Environmental Preservation of the Garden Highway
- California Native Plant Society, Sacramento Valley Chapter
- Cassidy & Associates
- Citizens for Good Government
- Community Watchdog Committee
- Creekside Natomas Neighborhood Association
- Dawson and Associates
- Delta Citizens Municipal Advisory Council
- Downtown Partnership
- Environmental Council of Sacramento
- Friends of the River
- Friends of the Sacramento River Greenway
- Friends of the Swainson’s Hawk
- Garden Highway Community Association
- Gardenland-Northgate Neighborhood Association
- The Gualco Group
- Habitat 2020
- Heritage Park Homeowners Association
- Law Offices of Gregory Thatch
- Metro Airpark
- Natomas Chamber of Commerce
- Natomas Community Association
- Natomas Park Master Association
- North Natomas Alliance
- North Natomas Community Association
- Pacific Gas & Electric Company
- Planning & Conservation League
- Port of Sacramento
- Reach 7 Property Owners
- Regency Park Community Association
- Rio Linda Union School District
- Rio Ramaza Marina
- River Oaks Community Association
- River Oaks Ranch in Natomas, LLC
- Sacramento Area Bicycle Advocates
- Sacramento Association of Realtors
- Sacramento Builders Exchange
- Sacramento County Farm Bureau
- Sacramento County Taxpayers
- Sacramento Groundwater Authority and Regional Water Authority
- Sacramento Metro Chamber
- Sacramento Public Library, Central Library, Federal Documents
- Sacramento River Property Owners Association
- Save Our Sandhill Cranes
- Save the American River Association
- Sierra Club, Mother Lode Chapter
- Steinberg & Associates
- Sutter County Resource Conservation District
- Swabbies
- Terrace Park Neighborhood Association
- The Natomas Basin Conservancy
- The Nature Conservancy, Sacramento River Program
- Urban Creeks Council
- Valley View Acres Community Association
- Water Forum
- West Natomas Community Association
- West Sacramento Chamber of Commerce
- Wickland Pipelines, LLC
7.4.4 MEDIA

- Daily Recorder
- Folsom Telegraph
- N Magazine
- Sacramento Business Journal
- Sacramento News & Review
- The Sacramento Bee

7.4.5 INDIVIDUAL PROPERTY OWNERS

- Names withheld for privacy
REFERENCES

ARB. See California Air Resources Board.
BBN. See Bolt Beranek and Newman Inc.
Caltrans. See California Department of Transportation.
CAPCOA. See California Air Pollution Control Officers Association.
Central Valley RWQCB. See Central Valley Regional Water Quality Control Board.
CNDDB. See California Natural Diversity Database.
DFG. See California Department of Fish and Game.
DWR. See California Department of Water Resources.
EPA. See U.S. Environmental Protection Agency.
FAA. See Federal Aviation Administration.
FEMA. See Federal Emergency Management Agency.
FHWA. See Federal Highway Administration.
FRAQMD. See Feather River Air Quality Management District.
HUD. See U.S. Department of Housing and Urban Development.
ITE. See Institute of Transportation Engineers.
LSCE. See Luhdorff & Scalmanini, Consulting Engineers.
NCASI. See National Council for Air and Stream Improvement.
NMFS. See National Marine Fisheries Service.
NRCS. See Natural Resources Conservation Service.
OPR. See Governor’s Office of Planning and Research.
PSMFC. See Pacific States Marine Fisheries Commission.
SAFCA. See Sacramento Area Flood Control Agency.
SACOG. See Sacramento Area Council of Governments.
Sacramento LAFCo. See Sacramento County Local Agency Formation Commission.
SCAS. See Sacramento County Airport System.
SGA. See Sacramento Groundwater Authority.
EXECUTIVE SUMMARY


1 INTRODUCTION AND STATEMENT OF PURPOSE AND NEED


2 ALTERNATIVES


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3.1 GENERAL SITE CONDITIONS

None.

3.2 AGRICULTURAL RESOURCES


3.3 LAND USE, SOCIOECONOMICS, AND POPULATION AND HOUSING


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3.5 HYDROLOGY AND HYDRAULICS


3.6 WATER QUALITY


3.7 BIOLOGICAL RESOURCES


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Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayoke. 1995. Fish Species of Special Concern of California. California Department of Fish and Game. Rancho Cordova, CA.


3.8 CULTURAL RESOURCES


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3.9 PALEONTOLOGICAL RESOURCES


3.10 TRANSPORTATION AND CIRCULATION


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3.11 AIR QUALITY


3.12 NOISE


3.13 RECREATION


Klinker, Dan, Associate Civil Engineer. Alternative Modes Coordinator. Sacramento County Department of Transportation, Sacramento, CA. May 22, 2009—E-mail to Melinda Rivasplata of EDAW regarding designated bicycle routes and Sacramento County Bikeway Master Plan.

3.14 VISUAL RESOURCES

City of Sacramento 2009 (March). City of Sacramento 2030 General Plan.


3.15 UTILITIES AND SERVICE SYSTEMS


3.16 HAZARDS AND HAZARDOUS MATERIALS


3.17 ENVIRONMENTAL JUSTICE


4.1 APPROACH TO THE ENVIRONMENTAL ANALYSIS


4.2 AGRICULTURAL RESOURCES


4.3 LAND USE, SOCIOECONOMICS, AND POPULATION AND HOUSING

City of Sacramento. 2009a (March). City of Sacramento 2030 General Plan.


Sacramento County Airport System. 2007. Sacramento International Airport Master Plan. Sacramento, CA.


4.4 GEOLOGY, SOILS, AND MINERAL RESOURCES


4.5 HYDROLOGY AND HYDRAULICS

None.
4.6 WATER QUALITY


4.7 BIOLOGICAL RESOURCES

California Department of Fish and Game. 1995. Staff Report on Burrowing Owl Mitigation. Sacramento, CA.

California Natural Diversity Database. 2009. Results of electronic record search. California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch. Sacramento, CA.


4.8 CULTURAL RESOURCES


4.9 PALEONTOLOGICAL RESOURCES


4.10 TRANSPORTATION AND CIRCULATION


4.11 AIR QUALITY


4.12 NOISE

California Department of Transportation. 2002 (February 20). *Transportation Related Earthborne Vibrations.* Sacramento, CA.


4.13 RECREATION


4.14 VISUAL RESOURCES


4.15 UTILITIES AND SERVICE SYSTEMS


4.16 HAZARDS AND HAZARDOUS MATERIALS


4.17 ENVIRONMENTAL JUSTICE


4.18 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FROM PREVIOUS NATOMAS LEVEE IMPROVEMENT PROGRAM PHASE 1–4a LANDSIDE IMPROVEMENTS PROJECTS


5 CUMULATIVE AND GROWTH-INDUCING IMPACTS, AND OTHER STATUTORY REQUIREMENTS


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6 COMPLIANCE WITH FEDERAL ENVIRONMENTAL LAWS AND REGULATIONS


7 CONSULTATION AND COORDINATION

None.
9 LIST OF PREPARERS

This EIS/EIR was prepared by AECOM at the direction of USACE and SAFCA, with assistance from MBK Engineers, HDR Engineering, Mead & Hunt, Wood Rodgers, and Kleinfelder.

The following is a list of the individuals who prepared sections of the EIS/EIR, provided significant background materials, provided project description engineering details, or participated in preparing the EIS/EIR.

9.1 U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
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<tr>
<td>Elizabeth Holland</td>
<td>Social Science Environmental Manager</td>
<td>24 years</td>
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<tr>
<td>Kathleen Dadey, Ph.D.</td>
<td>Chief, California Delta Branch, Regulatory</td>
<td>16 years</td>
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<tr>
<td>Dan Tibbitts, P.E.</td>
<td>Programs and Project Manager</td>
<td>18 years</td>
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<tr>
<td>Daniel Bell</td>
<td>Archaeologist</td>
<td>31 years</td>
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<tr>
<td>Greg Kukas, P.E.</td>
<td>Acting Chief, Hydrology and Hydraulics Branch</td>
<td>15 years</td>
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<tr>
<td>Lisa Clay</td>
<td>Assistant District Counsel</td>
<td>21 years</td>
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9.2 SACRAMENTO AREA FLOOD CONTROL AGENCY

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<tr>
<td>Timothy Washburn, J.D.</td>
<td>Director of Planning</td>
<td>20 years</td>
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<tr>
<td>John Bassett, P.E.</td>
<td>Director of Engineering, Project Manager</td>
<td>27 years</td>
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<tr>
<td>Pete Ghelfi, P.E.</td>
<td>Director of Engineering</td>
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<tr>
<td>Peter Buck</td>
<td>Natural Resource Supervisor</td>
<td>21 years</td>
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9.3 AECOM

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<tr>
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<tr>
<td>Francine Dunn</td>
<td>B.A. Environmental Studies; 25 years experience</td>
<td>Principal-in-Charge, EIS/EIR Project Manager</td>
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<tr>
<td>Phil Dunn</td>
<td>B.S. Zoology; M.S. Fisheries Biology; 29 years experience</td>
<td>Principal, Senior Reviewer/Advisor</td>
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<tr>
<td>Sarah Henningsen</td>
<td>B.S. Community and Regional Development; 6 years experience</td>
<td>EIS/EIR Assistant Project Manager, Executive Summary, Introduction and</td>
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<td>Statement of Purpose and Need, Compliance with Federal Environmental Laws and</td>
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<td>Regulations, Consultation and Coordination</td>
</tr>
<tr>
<td>David Rader</td>
<td>B.A. Print Journalism; M.A. Business Economics; Certificate program, Land Use and Environmental Planning; 6 years experience</td>
<td>EIS/EIR Assistant Project Manager; Alternatives; Hydrology and Hydraulics</td>
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<td>Reviewer; Cumulative and Growth-Inducing Impacts, and Other Statutory</td>
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<tr>
<td>Melinda Rivasplata</td>
<td>B.A. Environmental Biology; 26 years experience</td>
<td>Agricultural Resources; Land Use, Socioeconomics, and Population and Housing; Recreation; Visual Resources</td>
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<tr>
<td>Marianne Lowenthal</td>
<td>B.S. Environmental Toxicology; 3 years experience</td>
<td>Geology, Soils, and Mineral Resources; Paleontological Resources; Utilities and Service Systems; Hazards and Hazardous Materials</td>
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<tr>
<td>Wendy Copeland</td>
<td>B.S. Plant Science; M.S. Plant Pathology; 11 years experience</td>
<td>Geology, Soils, and Mineral Resources and Paleontological Resources Senior Reviewer</td>
</tr>
<tr>
<td>Jason Barrett</td>
<td>B.S. Environmental Science; M.P.A. Land Use/Real Estate; 14 years experience</td>
<td>Water Quality, Transportation and Circulation</td>
</tr>
<tr>
<td>Kara Baker</td>
<td>B.A. Environmental Sciences/Political Science, M.S. Environmental Engineering; 6 years experience</td>
<td>Hydrology and Hydraulics</td>
</tr>
<tr>
<td>Sarah Bennett</td>
<td>B.S. Botany and Plant Pathology; M.S. Soils and Biogeochemistry; 4 years experience</td>
<td>Biological Resources</td>
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<tr>
<td>Mike Eng</td>
<td>B.S. Ecology; B.A. English; 6 years experience</td>
<td>Permitting Task Leader, Biological Resources Reviewer</td>
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<tr>
<td>Leo Edson</td>
<td>B.S. Biological Studies; 26 years experience</td>
<td>Biological Resources Senior Reviewer</td>
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<tr>
<td>Mike Aviña</td>
<td>B.A. Anthropology; J.D. Law; 14 years experience</td>
<td>Cultural Resources, Environmental Justice</td>
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<tr>
<td>Steve Heipel</td>
<td>B.S. Anthropology; 37 years experience</td>
<td>Cultural Resources Senior Reviewer</td>
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<td>Sarah Sullivan</td>
<td>B.S. Environmental Management; M.P.A. Environmental Policy; 6 years experience</td>
<td>Air Quality</td>
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<tr>
<td>Greg Wolfe</td>
<td>B.A. Environmental Science; 22 years experience</td>
<td>Air Quality Senior Reviewer</td>
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<tr>
<td>Chris Shields</td>
<td>B.A. Environmental Studies; 4 years experience</td>
<td>Noise</td>
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<tr>
<td>Honey Walters</td>
<td>B.S. Environmental Science; M.S. Atmospheric Science; 13 years experience</td>
<td>Air Quality and Noise Senior Reviewer</td>
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<tr>
<td>Lisa Clement</td>
<td>B.S. Environmental and Resource Sciences; 11 years experience</td>
<td>Geographic Information Systems</td>
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<tr>
<td>Phi Ngo</td>
<td>B.A. Communication (Geographic Information Systems Minor); 4 years experience</td>
<td>Geographic Information Systems</td>
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<tr>
<td>Lorrie Jo Williams</td>
<td>B.S. Design; 22 years experience</td>
<td>Graphics</td>
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<tr>
<td>Deborah Jew</td>
<td>24 years experience</td>
<td>Word Processing, Document Production</td>
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### 9.4 MBK ENGINEERS

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<th>Name</th>
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<tr>
<td>Joseph D. Countryman, P.E.</td>
<td>B.S. Civil Engineering; 43 years experience</td>
<td>Hydraulic Modeling Review</td>
</tr>
<tr>
<td>Ric Reinhardt, P.E.</td>
<td>B.S. Civil Engineering; M.S. Civil Engineering; 14 years experience</td>
<td>Hydraulic Modeling Review</td>
</tr>
<tr>
<td>Mike Archer, P.E.</td>
<td>B.S. Civil Engineering; M.S. Civil Engineering; 26 years experience</td>
<td>Hydraulic Modeling</td>
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### 9.5 HDR ENGINEERING

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<th>Name</th>
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<tr>
<td>Christopher Krivanec, P.E., G.E.</td>
<td>B.S. Civil Engineering; M.S. Civil Engineering (Geotechnical); M.E. Civil Engineering (Geotechnical); 17 years experience</td>
<td>Project Manager for Sacramento River East Levee Design (provided relevant project description information)</td>
</tr>
<tr>
<td>Blake Johnson, P.E.</td>
<td>B.S. Civil Engineering; 19 years experience</td>
<td>Design Manager for Sacramento River East Levee Design (provided relevant project description information)</td>
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<tr>
<td>Elizabeth Baldi, P.E.</td>
<td>B.S. Civil Engineering; 6 years experience</td>
<td>Project Engineer for Sacramento River East Levee Design (provided relevant project description information)</td>
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### 9.6 MEAD & HUNT

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<tr>
<td>Steve Sullivan, P.E.</td>
<td>B.S. Civil Engineering; 28 years experience</td>
<td>Project Manager for Canal Design and Borrow Investigation (provided relevant project description information)</td>
</tr>
<tr>
<td>Marieke Armstrong</td>
<td>B.S. Ecology, Behavior, Evolution; M.S. Environmental Science; 11 years experience</td>
<td>Environmental Coordinator for Canal Design and Borrow Investigations (provided relevant project description information)</td>
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## 9.7 WOOD RODGERS

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<tr>
<td>Jonathan Kors, P.E.</td>
<td>B.S. Civil Engineering; 12 years experience</td>
<td>Project Manager for Natomas Cross Canal South Levee, Pleasant Grove Creek Canal West Levee, and Natomas East Main Drainage Canal West Levee Design (provided relevant project description information)</td>
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<tr>
<td>Carlos Contreras, P.E.</td>
<td>B.S. Civil Engineering; 11 years experience</td>
<td>Project Engineer for Natomas Cross Canal South Levee, Pleasant Grove Creek Canal West Levee, and Natomas East Main Drainage Canal West Levee Design (provided relevant project description information)</td>
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<tr>
<td>Peter Tobia, P.E.</td>
<td>B.S. Civil Engineering; 20 years experience</td>
<td>Quality Control Manager for Natomas Cross Canal South Levee, Pleasant Grove Creek Canal West Levee, and Natomas East Main Drainage Canal West Levee Design (provided relevant project description information)</td>
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<tr>
<td>Peter Blum</td>
<td>B.S. Civil Engineering; 11 years experience</td>
<td>Project Engineer for Pleasant Grove Creek Canal West Levee and Natomas East Main Drainage Canal West Levee Design (provided relevant project description information)</td>
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